CHRONIC CARE MANAGEMENT

A project Submitted to

ST. MARY'S COLLEGE (AUTONOMOUS), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

in partial fulfilment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted By

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May – 2022

CERTIFICATE

This is to certify that this project work entitled as "**CHRONIC CARE MANAGEMENT"** is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to **Manonmaniam Sundaranar University**, **Tirunelveli,** in partial fulfilment for the award of the degree of Master of Science in Computer Science for the work done during the year 2021-2022 by **AKILA. G (REG NO: 20SPCS01).**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do hereby declare that the project entitled **"CHRONIC CARE MANAGEMENT"** submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET,** Assistant Professor, PG Department of Computer Science (SSC), St. Mary's College (Autonomous), Thoothukudi.

Place:

Date: **Signature of the Student**

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength to finish our project successfully.

My sincere thanks to **Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Joshpine Jeyarani, Director of SSC**, St. Mary's College(Autonomous), Thoothukudi, for giving permission to work on this project.

I express my hearty thanks to my guide **Ms. C. Nayanthra Mascarenhas M.Sc., MPhil., SET.,** Assistant professor and Coordinator, PG Department of computer science (SSC) for her valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to **Ms. A. Jenita Jebamalar M.Sc. (IT), M.Sc. (CS), M. Phil. B.Ed.,** Assistant Professor, PG Department of computer science (SSC) and **Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D.,** Assistant Professor, PG Department of Computer Science (SSC), for her encouragement and support.

I am much indebted to **Mr. Saravanan Chandra Krishnan** for his untiring effort, immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

ABSTRACT

In the current situation many people are affected by permanent problems like blood pressure and blood sugar problems. To reduce these kinds of problems we have to take care of the people. We have to avoid the problem before moving to be serious. ”CHRONIC CARE MANAGEMENT” is developed in Visual studio 2019 used to take care of the people who are above 65 and who have two or more lifetime problems. . Chronic care management is beneficial for patients in terms of ongoing health and wellness support, increased access to appropriate medical resources, enhanced communication with members of their care team, reduction in emergency room visits and hospitalization or readmissions, and increased engagement in their own healthcare. Chronic care management includes any care provided by medical professionals to patients who have chronic diseases and conditions. A disease or condition is chronic when it lasts a year or more, requires ongoing medical attention or limits the activities of daily life. It includes physical conditions like diabetes or mental conditions, like depression. This project is developed in an online mode. The patient information is enrolled in the patient tab. In the CCM module the eligible patient names will be displayed. In the list of eligible patients, the patient’s signature will be uploaded by the sign consent if they agree. If a patient was admitted to the hospital for any problem in between the monthly check up, that details will be entered in the Clinical Intake. After the sign is uploaded, the name of the patient will be displayed in the Summary Patient and also we can upload some other details about the patient. The monthly check up call was made by the provider and he will track the time and ask questions about the patient’s problem. If the patient is normal, the provider comments about the health condition of the patient. If there is any problem, he will advise the patient to do some activities or call the patient to the clinic. This is followed every month and the bill will be generated to the patient based on call timing.

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INTRODUCTION

Intelligent Healthcare Delivered from the Cloud:

The patient care journey is traditionally a fragmented one, especially for more complex cases or chronic conditions that involve multiple healthcare providers and clinical specialists. As a result, a patient's critical health data may be stored and siloed across disparate IT systems or in outdated pen-and-paper systems.

Remote Cares was founded to solve this challenge. Remote Cares is transforming the healthcare space with its unified platform for health management, which collects and consolidates data from clinical management systems, medical devices, and patients in real time into a single view and protects it with modern encryption standards. It also provides intelligent healthcare, with built-in risk stratification tools, care plan templates, continuous monitoring of vitals, smart algorithms, and data analytics.

Real-Time Remote Consultation with Telehealth:

One of the headline features of Remote Cares is its telehealth platform, a highly popular video-conferencing solution that connects healthcare providers with patients to offer remote consultations whether in one-on-one sessions or in conferences of up to 100 people.

Preventive services:

Preventive care is care you receive to prevent illness, detect medical conditions, and keep you healthy. Medicare Part B covers many preventive services, such as screenings, vaccines, and counseling. Remote Care's intuitive platform is a one-stop wellness program built to help practices get compliant, patients get the most out of proactive care, and practitioners get time back in their days to focus on connecting and providing excellent care. It's HIPAA (The Health Insurance Portability and Accountability Act of 1996) compliant and covers more facets of Medicare preventive care than any other platform.

Our most popular software solutions allow practices to effectively manage these Medicare programs in their office with their staff. We'll provide the tools and training. You provide the clinical resources. Medicare Programs supported through our platform include:

- Chronic Care Management
- Remote Patient Monitoring
- Annual Wellness Visits

SYSTEM SPECIFICATIONS

HARDWARE REQUIREMENTS

Front-end Tools	:	Visual Studio 2019
Back-end Tools	:	Microsoft SQL Server Management Studio
Web API	:	Rest API
Platform	:	Windows

SOFTWARE REQUIREMENTS

Operating System	:	Windows 10
Application Front-end Tools	:	UI
Database Back-end Tools	:	Entity Framework Core

INSTALLATION PROCEDURE

Step 1 - Make sure your computer is ready for Visual Studio

Before you begin installing Visual Studio:

1. Check the system requirements. These requirements help you know whether your computer supports Visual Studio 2019.
2. Apply the latest Windows updates. These updates ensure that your computer has both the latest security updates and the required system components for Visual Studio.
3. Reboot. The reboot ensures that any pending installs or updates don't hinder your Visual Studio install.
4. Free up space. Remove unneeded files and applications from your system drive by, for example, running the Disk Cleanup app.

For questions about running previous versions of Visual Studio side by side with Visual Studio 2019, see Visual Studio 2019 Platform Targeting and Compatibility.

Step 2 - Download Visual Studio

Next, download the Visual Studio bootstrapper file.

To do so, choose the following button, choose the edition of Visual Studio that you want, choose **Save**, and then choose **Open folder**.

Download Visual Studio

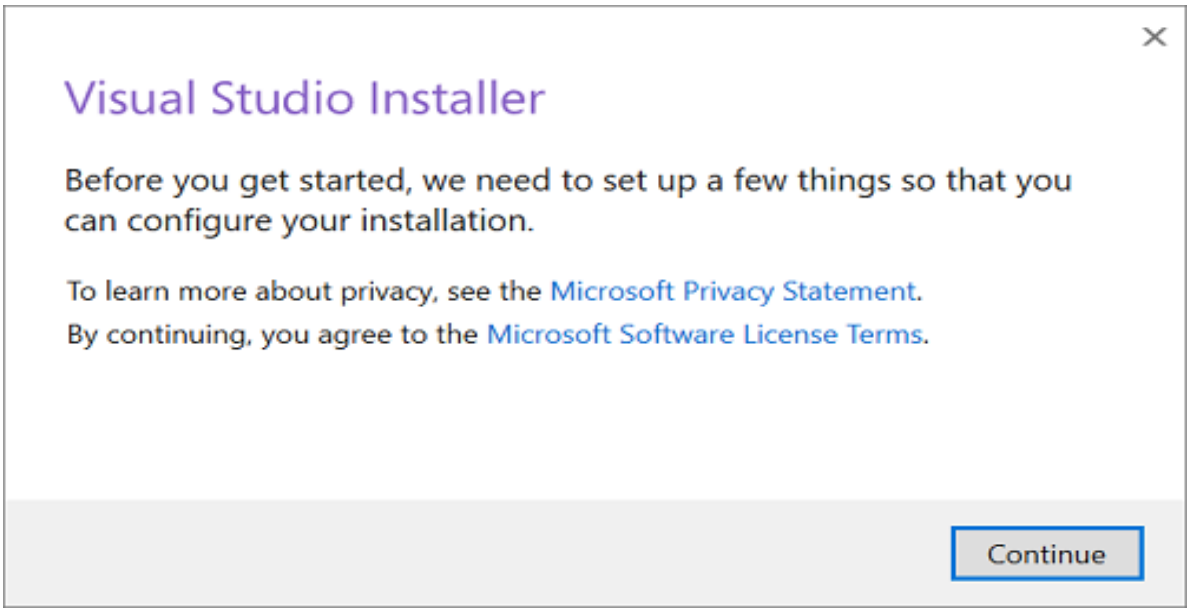
Step 3 - Install the Visual Studio Installer

Run the bootstrapper file to install the Visual Studio Installer. This new lightweight installer includes everything you need to both install and customize Visual Studio.

1. From your **Downloads** folder, double-click the bootstrapper that matches or is similar to one of the following files:
    - **vs_community.exe** for Visual Studio Community
    - **vs_professional.exe** for Visual Studio Professional
    - **vs_enterprise.exe** for Visual Studio Enterprise

    If you receive a User Account Control notice, choose **Yes**.

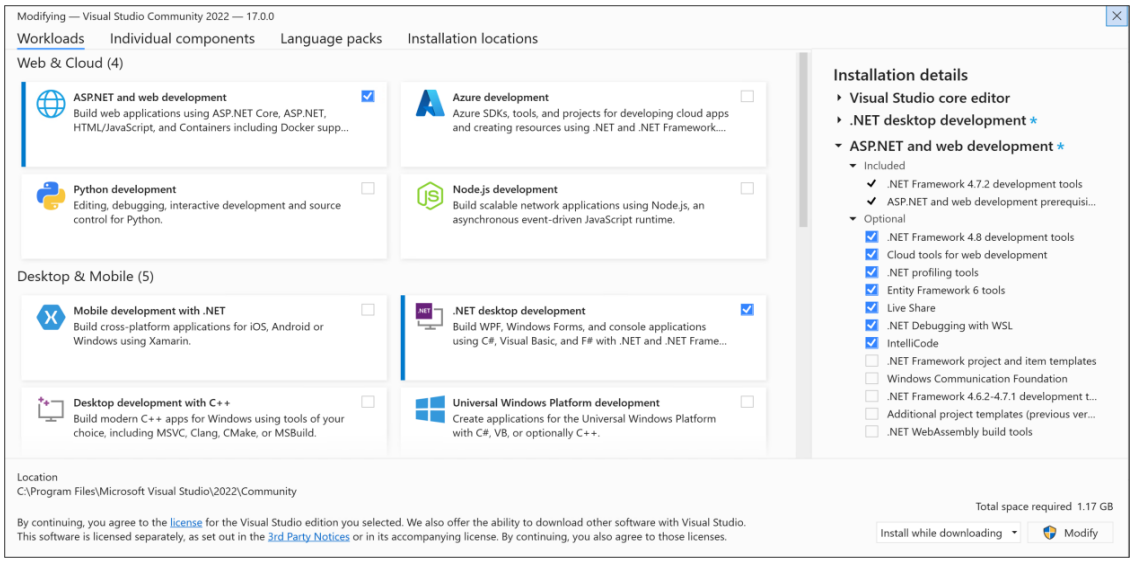
2. We'll ask you to acknowledge the Microsoft License Terms and the Microsoft Privacy Statement. Choose **Continue**.



Step 4 - Choose workloads

After the installer is installed, you can use it to customize your installation by selecting the feature sets—or workloads—that you want. Here's how.

1. Find the workload you want in the **Visual Studio Installer**.



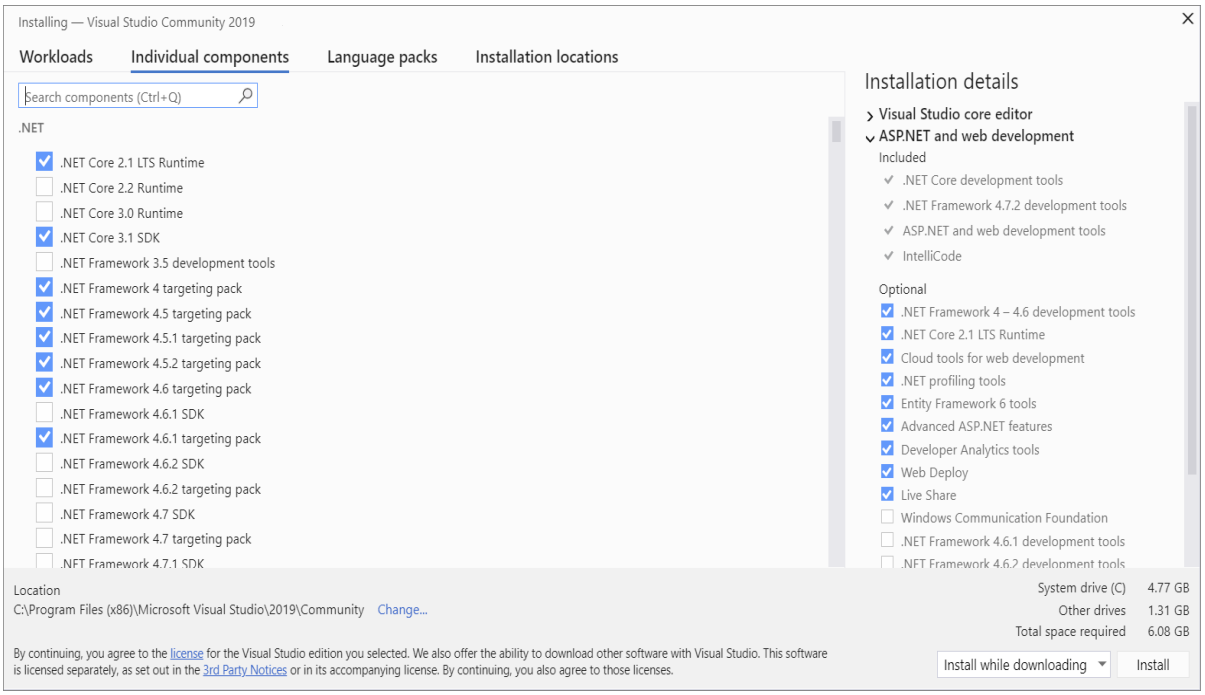
For example, choose the "ASP.NET and web development" workload. It comes with the default core editor, which includes basic code editing support for over 20 languages, the ability to open and edit code from any folder without requiring a project, and integrated source code control.

1. After you choose the workload(s) you want, choose **Install**.

Next, status screens appear that show the progress of your Visual Studio installation.

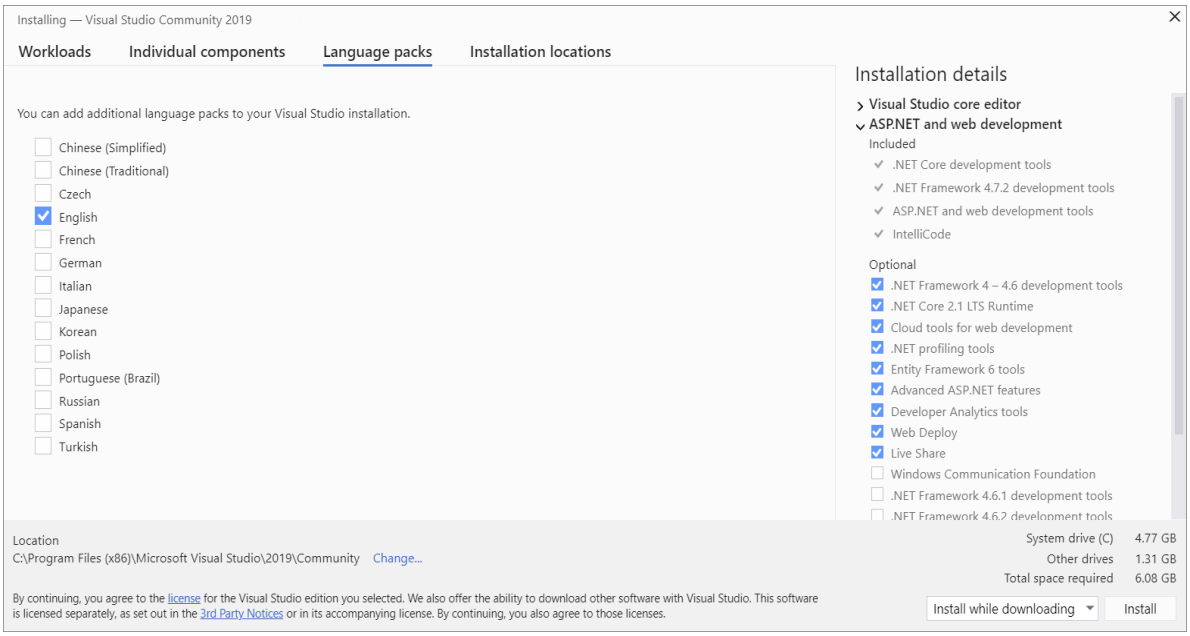
Step 5 - Choose individual components (optional)

If you don't want to use the Workloads feature to customize your Visual Studio installation, or you want to add more components than a workload installs, you can do so by Installing or adding individual components from the **Individual components** tab. Choose what you want, and then follow the prompts.



Step 6 - Install language packs (optional)

By default, the installer program tries to match the language of the operating system when it runs for the first time. To install Visual Studio in a language of your choosing, choose the **Language packs** tab from the Visual Studio Installer, and then follow the prompts.

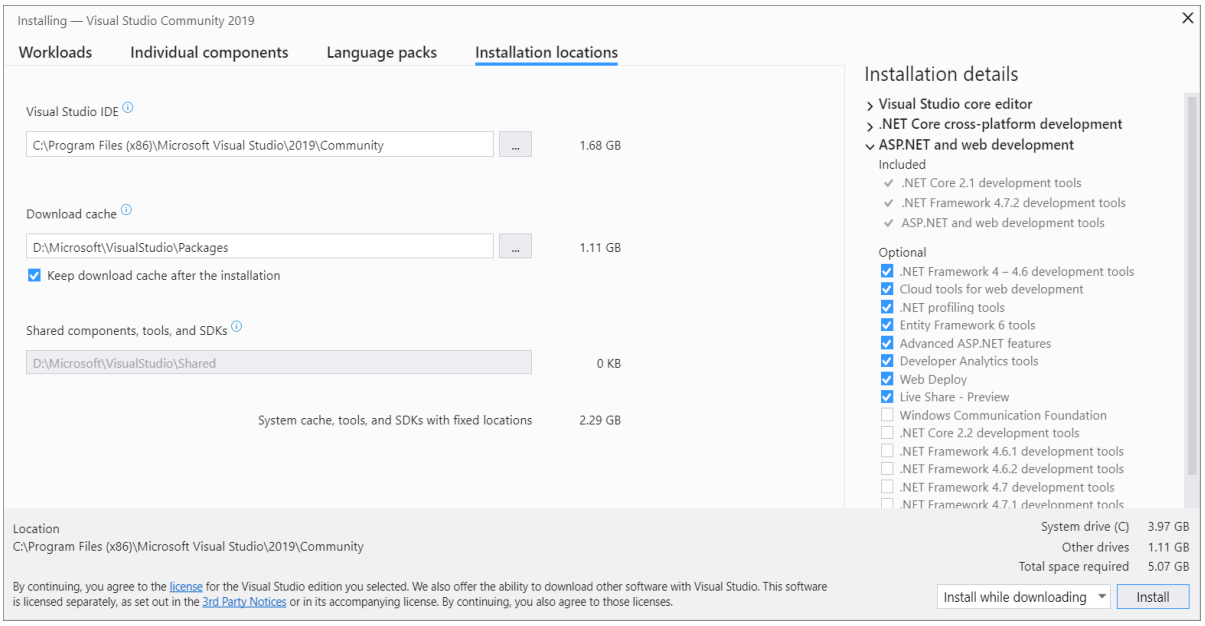


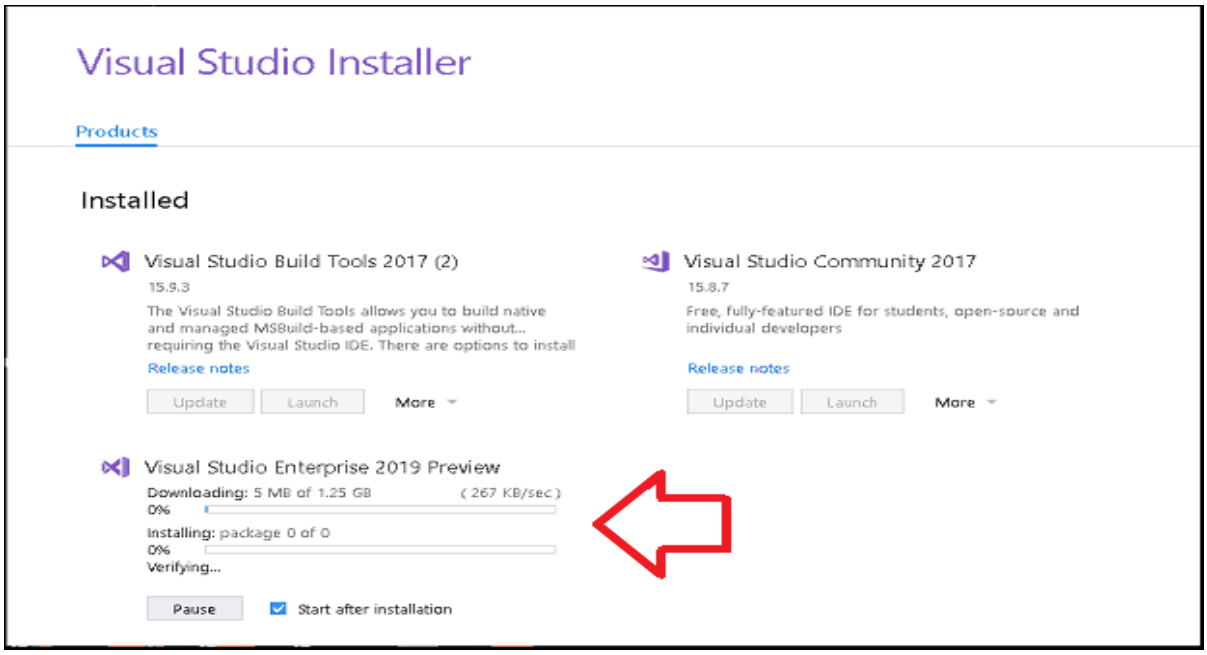
Change the installer language from the command line

Another way that you can change the default language is by running the installer from the command line. For example, you can force the installer to run in English by using the following command: vs_installer.exe --locale en-US. The installer will remember this setting when it is run the next time. The installer supports the following language tokens: zh-cn, zh-tw, cs-cz, en-us, es-es, fr-fr, de-de, it-it, ja-jp, ko-kr, pl-pl, pt-br, ru-ru, and tr-tr.

Step 7 - Select the installation location (optional)

You can reduce the installation footprint of Visual Studio on your system drive. You can choose to move the download cache, shared components, SDKs, and tools to different drives, and keep Visual Studio on the drive that runs it the fastest.


Installing — Visual Studio Community 2019
Workloads
Individual components
Language packs
Installation locations
Visual Studio IDE
C:\Program Files (x86)\Microsoft Visual Studio\2019\Community
1.68 GB
Download cache
D:\Microsoft\VisualStudio\Packages
1.11 GB
Keep download cache after the installation
Shared components, tools, and SDKs
D:\Microsoft\VisualStudio\Shared
0 KB
System cache, tools, and SDKs with fixed locations
2.29 GB
Installation details
Visual Studio core editor
.NET Core cross-platform development
ASP.NET and web development
Included
.NET Core 2.1 development tools
.NET Framework 4.7.2 development tools
ASP.NET and web development tools
Optional
.NET Framework 4 – 4.6 development tools
Cloud tools for web development
.NET profiling tools
Entity Framework 6 tools
Advanced ASP.NET features
Developer Analytics tools
Web Deploy
Live Share - Preview
Windows Communication Foundation
.NET Core 2.2 development tools
.NET Framework 4.6.1 development tools
.NET Framework 4.6.2 development tools
.NET Framework 4.7 development tools
Location
C:\Program Files (x86)\Microsoft Visual Studio\2019\Community
System drive (C) 3.97 GB
Other drives 1.11 GB
Total space required 5.07 GB
By continuing, you agree to the license for the Visual Studio edition you selected. We also offer the ability to download other software with Visual Studio. This software is licensed separately, as set out in the 3rd Party Notices or in its accompanying license. By continuing, you also agree to those licenses.
Install while downloading
Install


Visual Studio Installer
Products
Installed
Visual Studio Build Tools 2017 (2)
15.9.3
The Visual Studio Build Tools allows you to build native and managed MSBuild-based applications without... requiring the Visual Studio IDE. There are options to install
Release notes
Update
Launch
More
Visual Studio Community 2017
15.8.7
Free, fully-featured IDE for students, open-source and individual developers
Release notes
Update
Launch
More
Visual Studio Enterprise 2019 Preview
Downloading: 5 MB of 1.25 GB (267 KB/sec)
0%
Installing: package 0 of 0
0%
Verifying...
Pause
Start after installation

Step 8 - Start developing

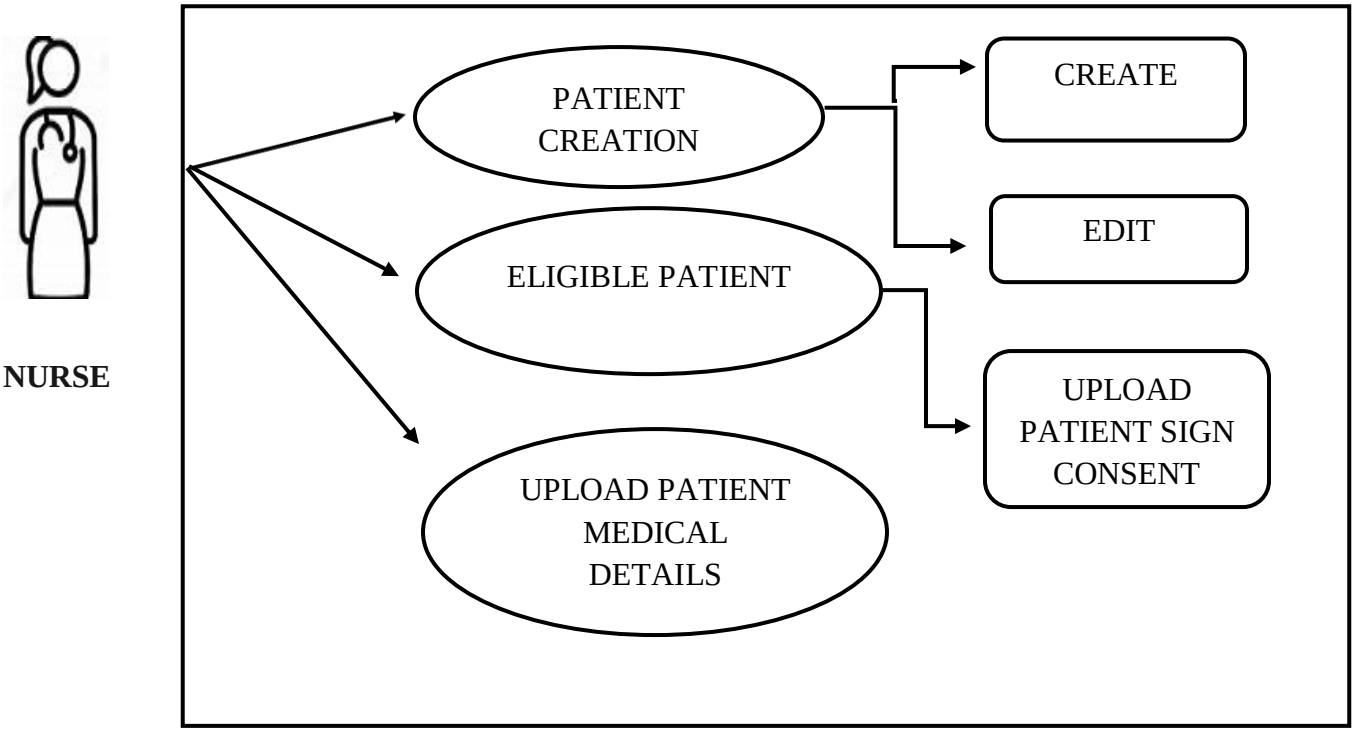
1. After Visual Studio installation is complete, select the **Launch** button to get started developing with Visual Studio.
2. On the start window, choose **Create a new project**.
3. In the search box, enter the type of app you want to create to see a list of available templates. The list of templates depends on the workloads that you chose during installation.

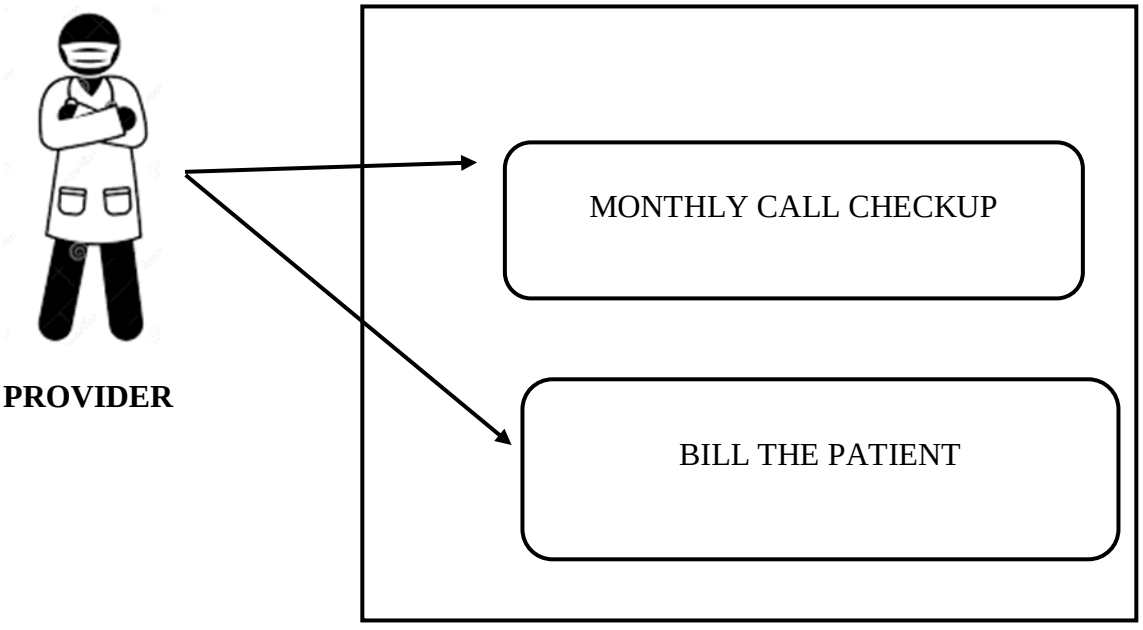
   To see different templates, choose different workloads you can also filter your search for a specific programming language by using the **Language** drop-down list. You can filter by using the **Platform** list and the **Project type** list, too.

4. Visual Studio opens your new project, and you're ready to code!

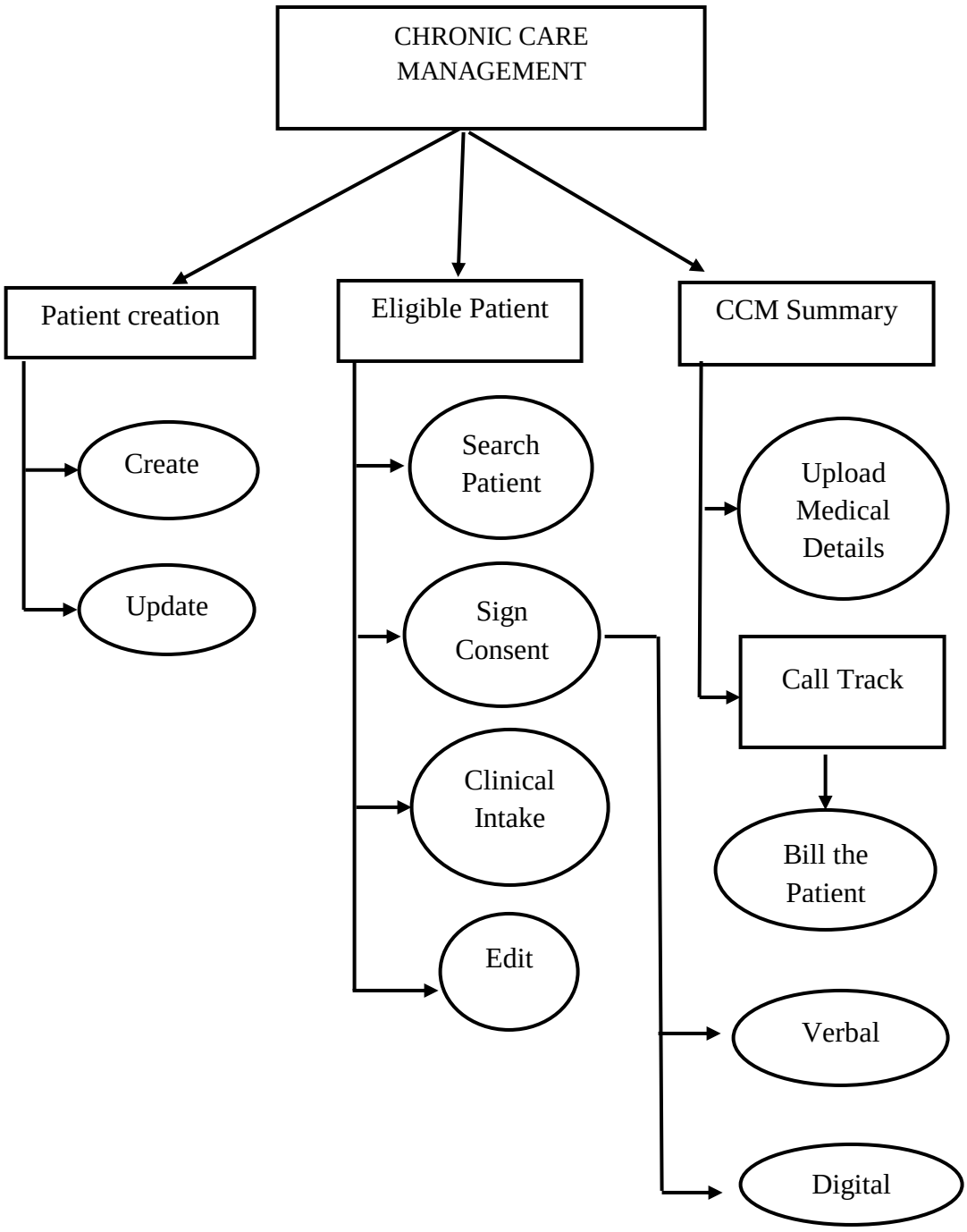
SYSTEM DESIGN

USECASE DIAGRAM:





ENTITLED RELATIONSHIP DIAGRAM



PROJECT DESCRIPTION

Chronic care management (CCM) is a critical component of primary care that contributes to better outcomes and higher satisfaction for patients. The Centers for Medicare & Medicaid Services (CMS) recognizes that providing CCM services takes provider time and effort. CMS established separate payment under billing codes for the additional time and resources you spend to provide the between-appointment help many of your Medicare and dual eligible (Medicare and Medicaid) patients need to stay on track with their treatments and plan for better health.

Patients Benefit from CCM:

- Your patients will gain a team of dedicated health care professionals who can help them plan for better health and stay on track for good health.
- Patients will receive a comprehensive care plan.
- Encouraging patients to use CCM will give them the support they need between visits.

CCM Supports Your Practice:

- Improve care coordination.
- Support patient compliance and help patients feel more connected.
- Sustain and grow your practice.

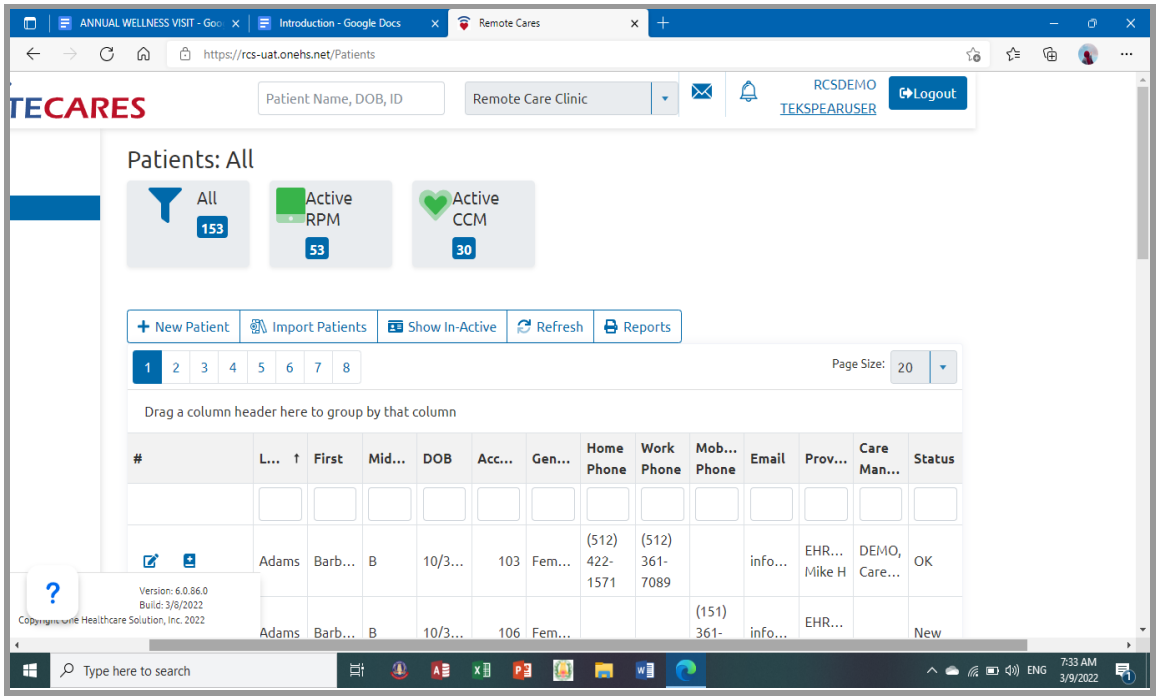
Eligibility:

Patients eligible for separately payable CCM services are Medicare fee-for-service and dual eligible (Medicare and Medicaid) beneficiaries with two or more chronic conditions expected to last at least twelve months or until the death of the patient, when those conditions place the patient at significant risk of death, acute exacerbation/ decompensation, or functional decline. These are the only diagnostic criteria.

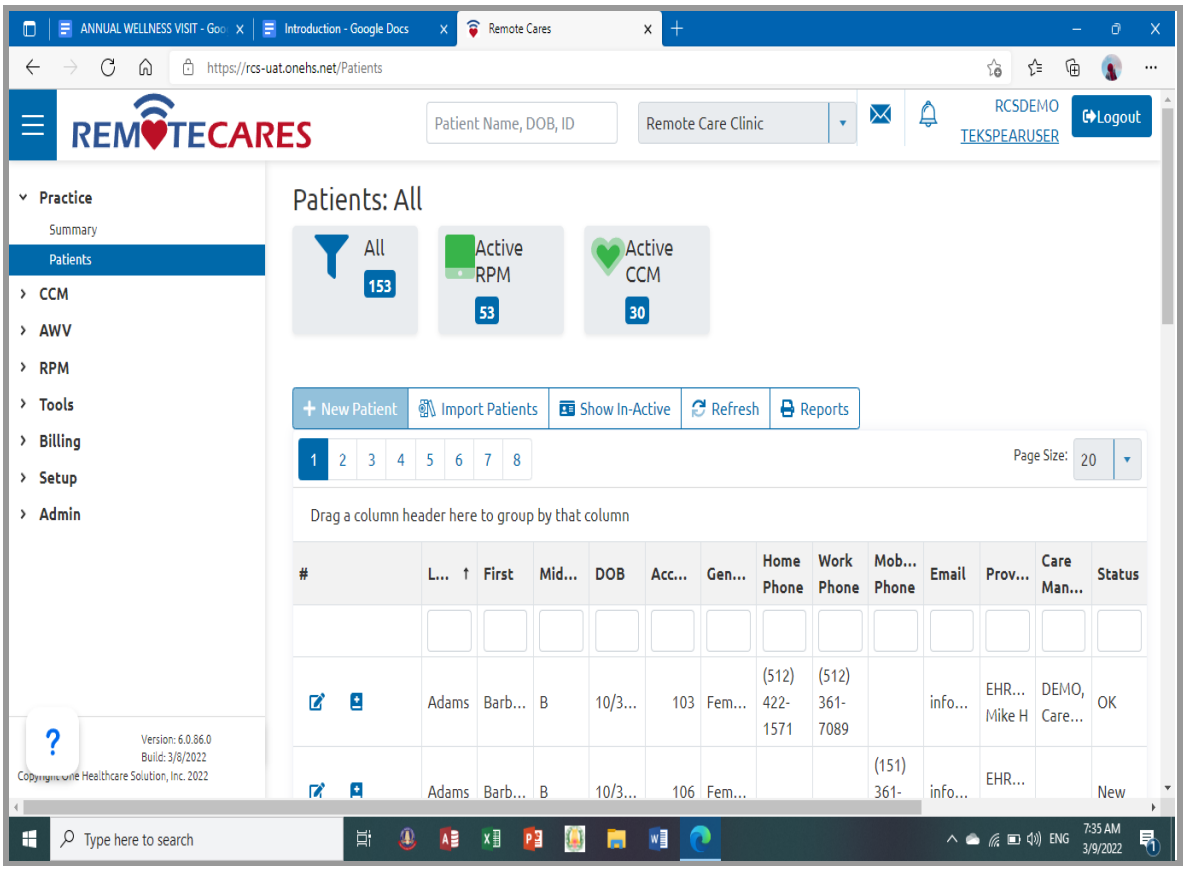
Examples of chronic conditions include, but are not limited to, the following: Alzheimer's disease and related dementias, arthritis, asthma, atrial fibrillation, autism spectrum disorders, cancer, cardiovascular disease, chronic obstructive pulmonary disease, depression, substance use disorders, diabetes, hypertension, and infectious diseases such as HIV/AIDS.

CREATION OF PATIENTS:

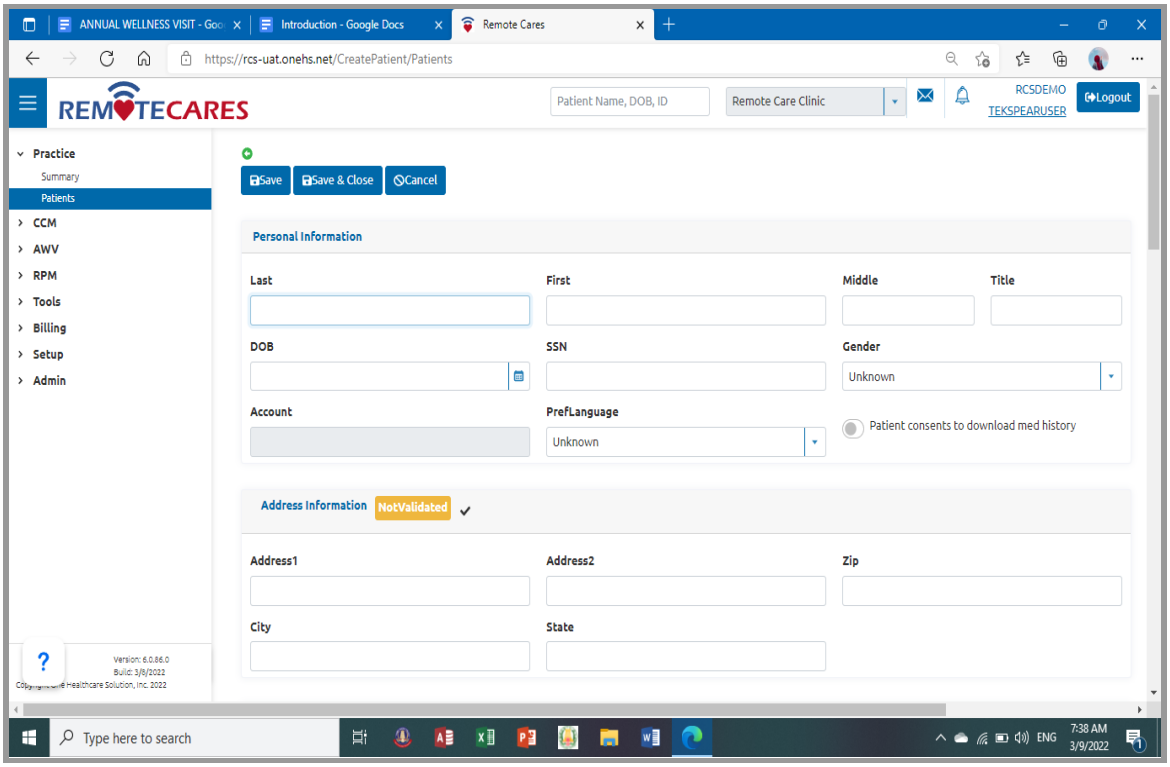
Patient information can be found by clicking the **“Patient”** link in the navigation menu. From the main “Patient” page users are able to access patient summaries, create new patients, edit existing patients, bulk import patients from an EMR or other third party,



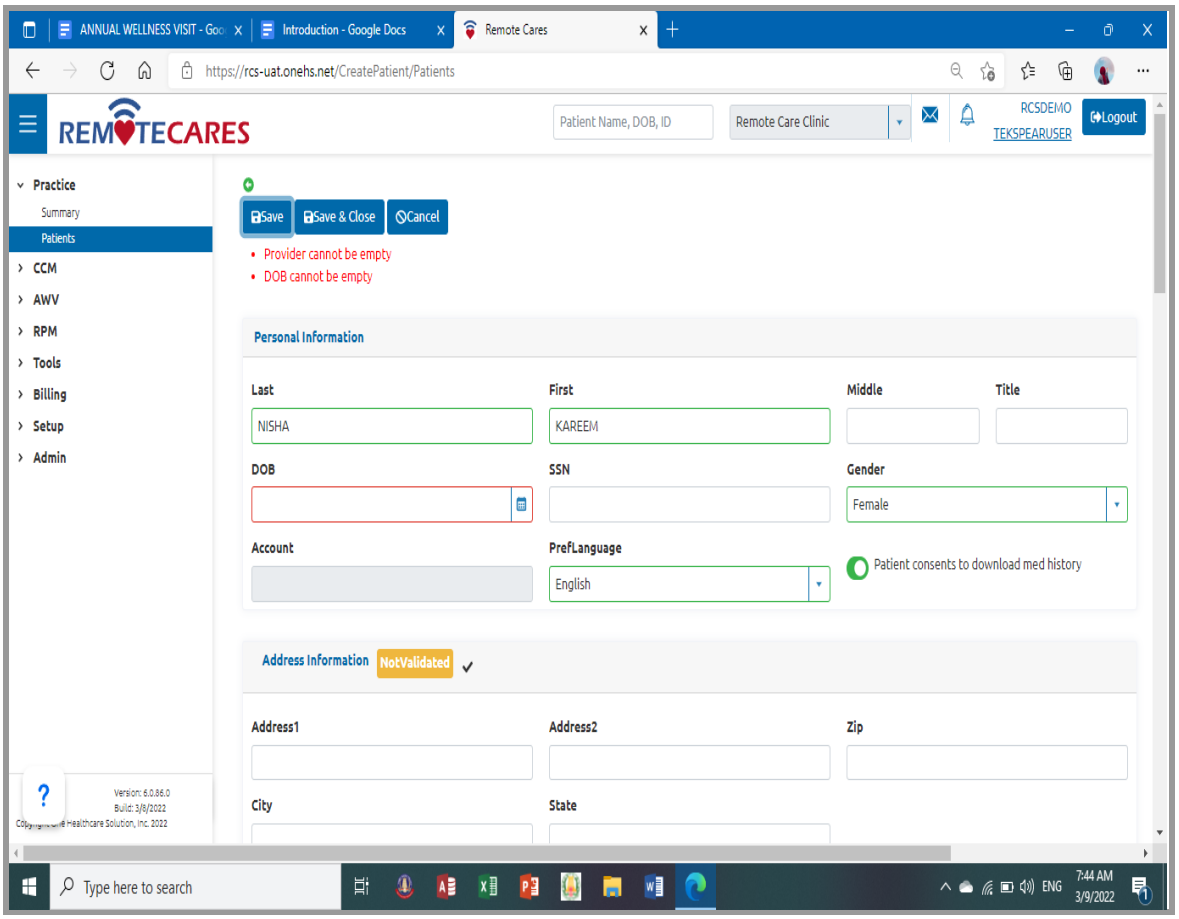
To create a new patient, click blue “New Patient” button at the upper right of the “Patients” page.



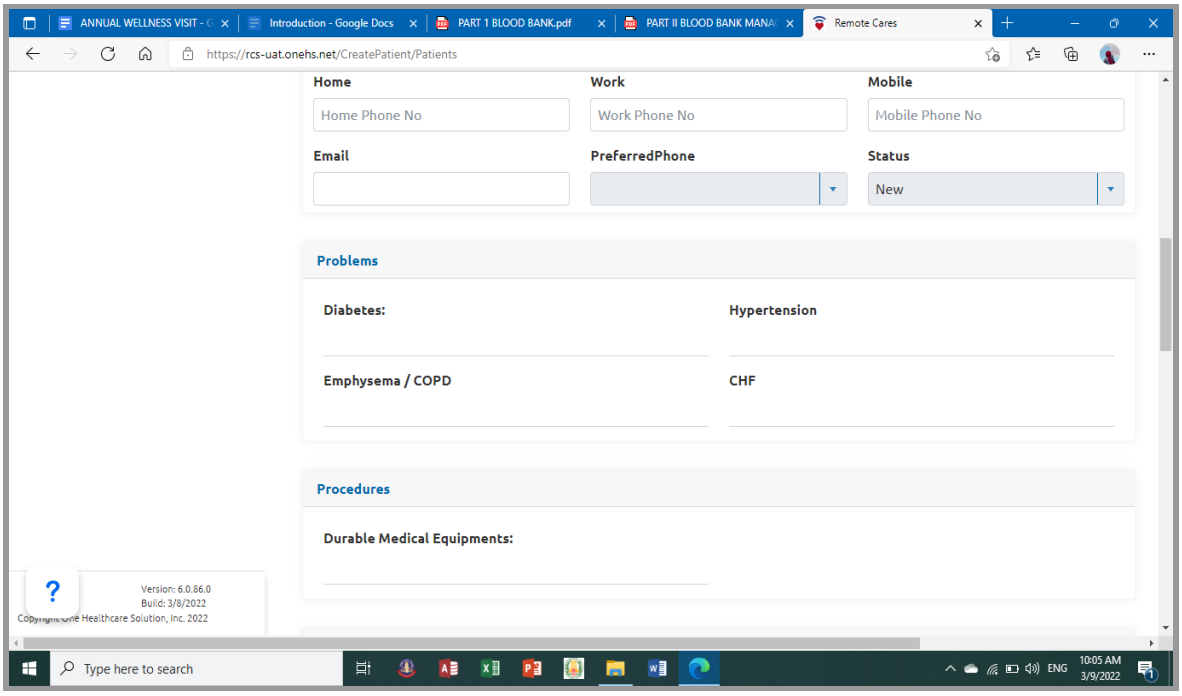
This will launch the “Create New Patient” wizard. Users will go through all three tabs (Patient Information, Contact Information, Insurances) entering the appropriate information to establish the patient.



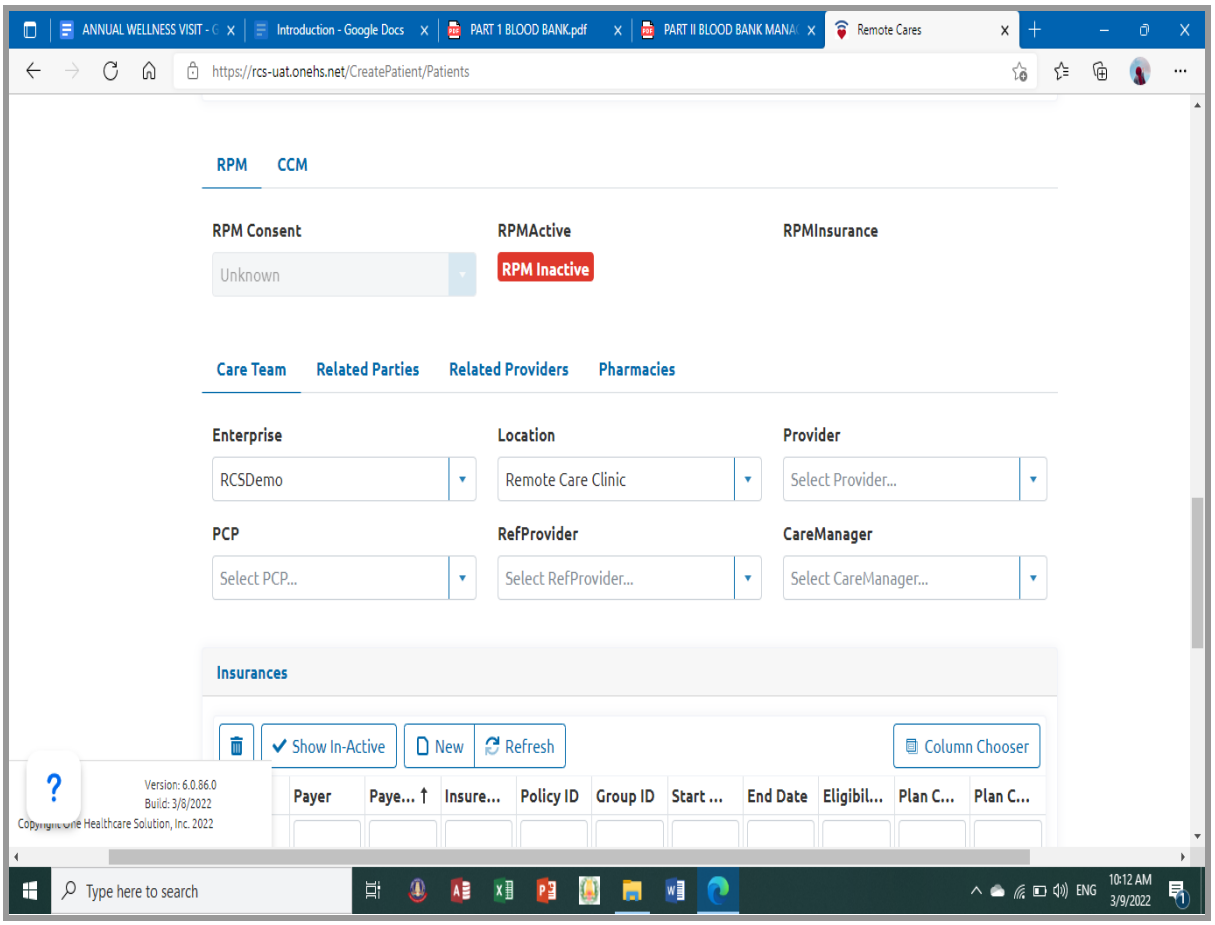
A red dot (.) denotes information that is required in order to advance through the wizard. The more information that is provided in these steps, the more accurate the eligibility and billing recommendations will be.



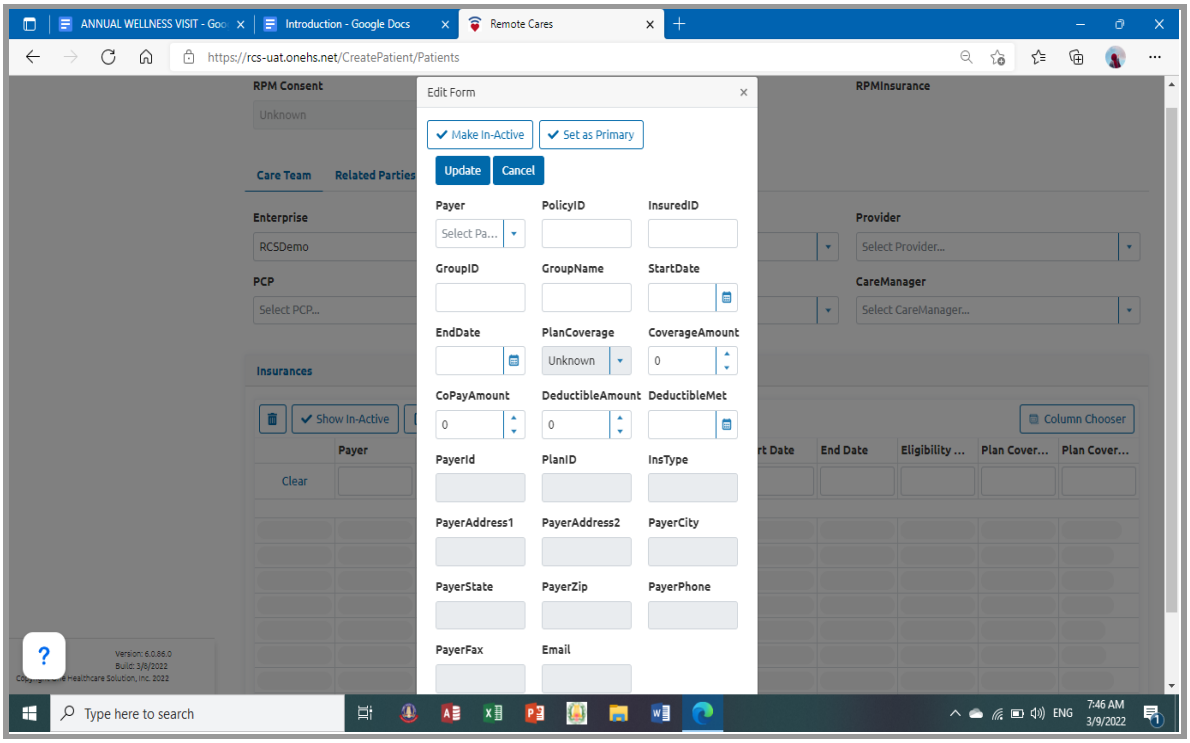
After providing the patient information, the problems and procedures will be asked. The common problems include Diabetes, Hypertension, COPD and CHF. This will require the problems faced by the patients. Procedures include medical equipment used by the patients. These details were given for more understanding about the patient.



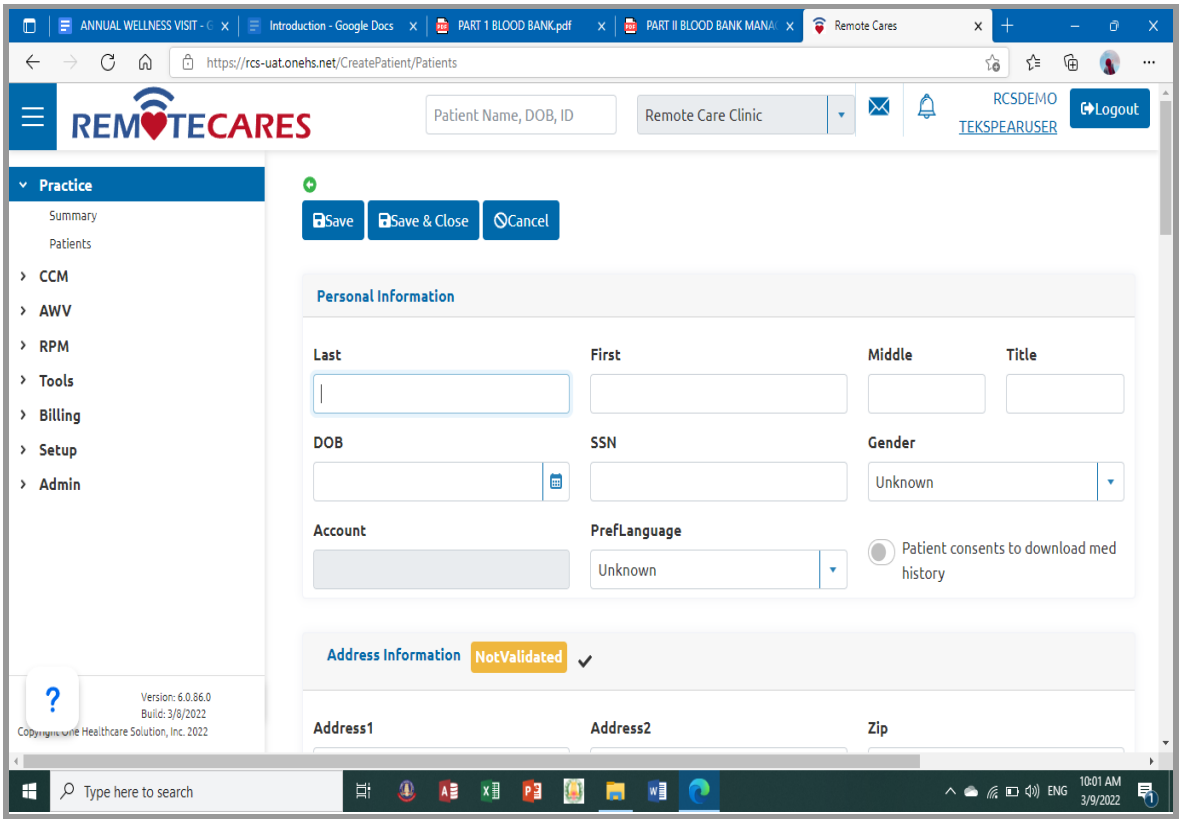
Then, the details of the Care Team, Related parties, Related Providers and Pharmacies were entered. In the Care team menu, the name of the Enterprise, Provider and Care Manager were given. The Related Parties menu includes the details of the parties, Related Providers includes the details of the providers and the Pharmacies include the details of the pharmacy store etc.



Within the “Insurances" tab, users should be sure to enter all medical insurance policies that the patient has. This will prompt a screen requesting identifying information about the insurance policy.



It is important that users click the blue “Update” button at the bottom right of the wizard. Insurance policies can be added until all of the patient’s information is in the system.

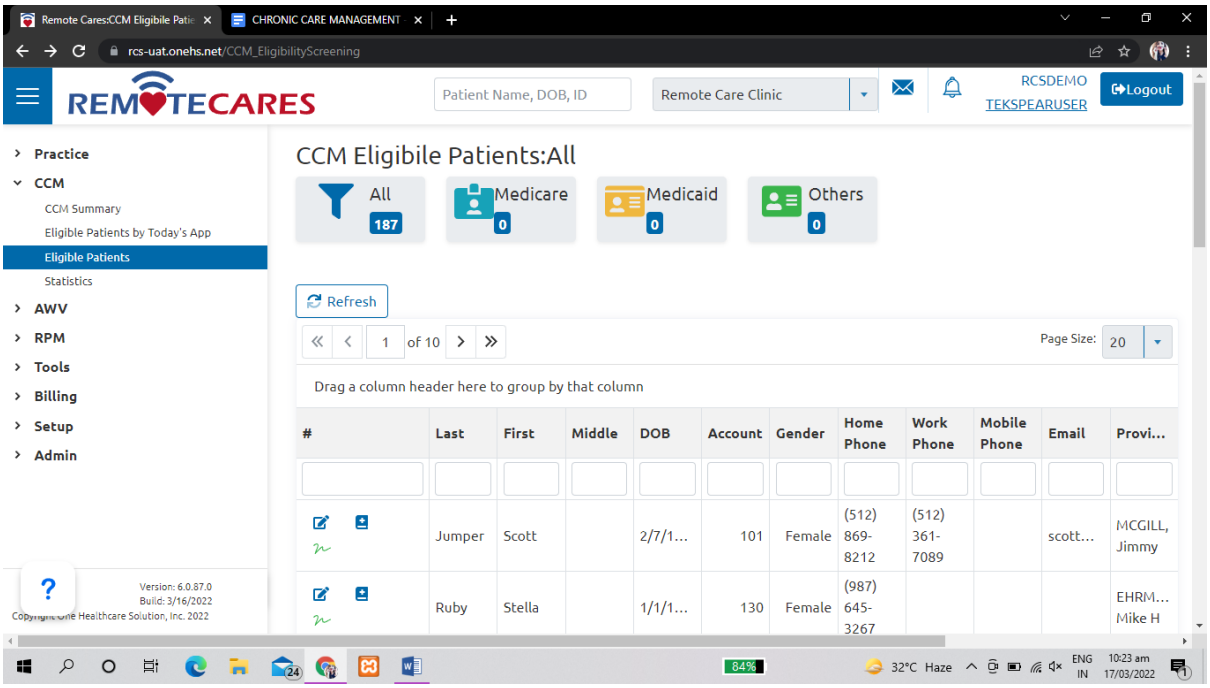


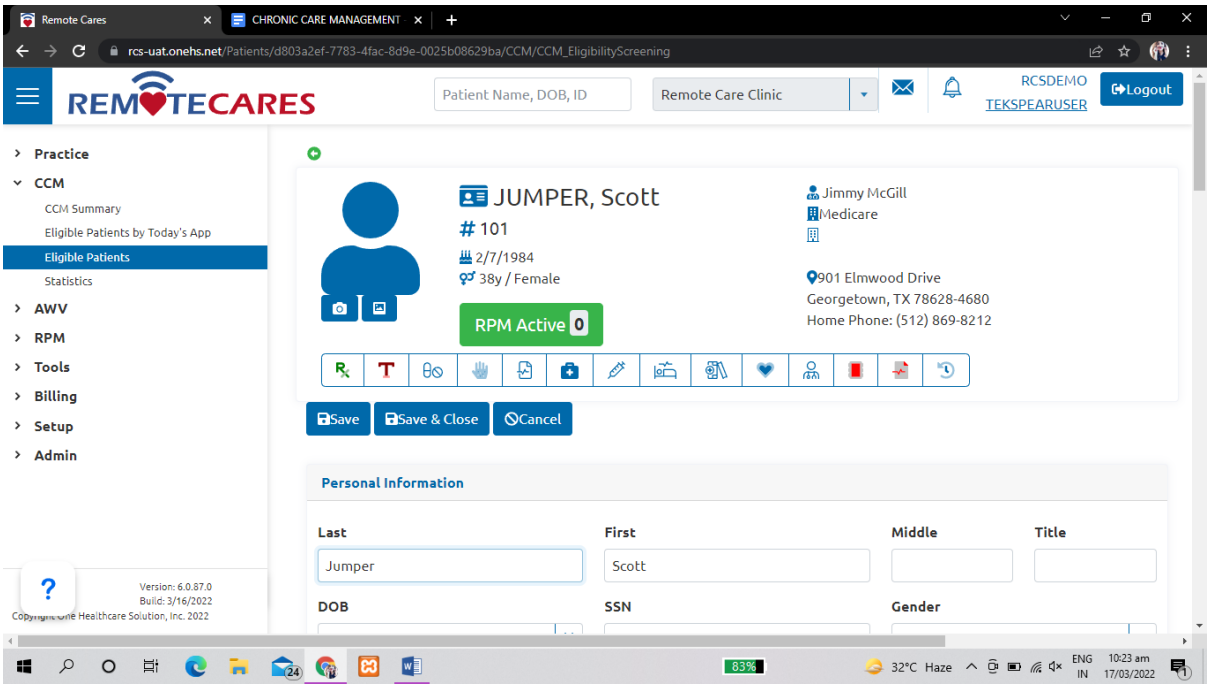
When finished, users will click the blue **"Save"** button in the bottom right of the wizard to finalize the creation of the new patient.

Chronic care management:

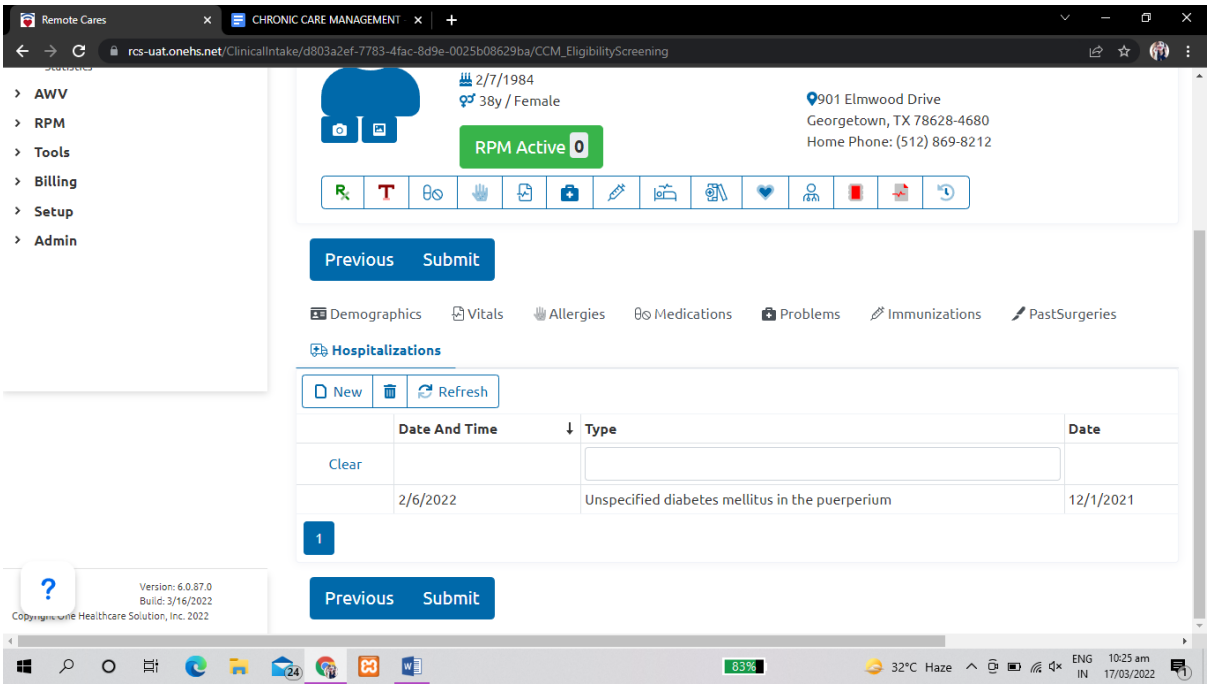
Eligible patient:

The patients who are above 65 can be registered in ccm which will be displayed in eligible patients, and it has some menus such as edit, clinical intake, and sign consent. If we have to update the information about the patient we have to click edit button,



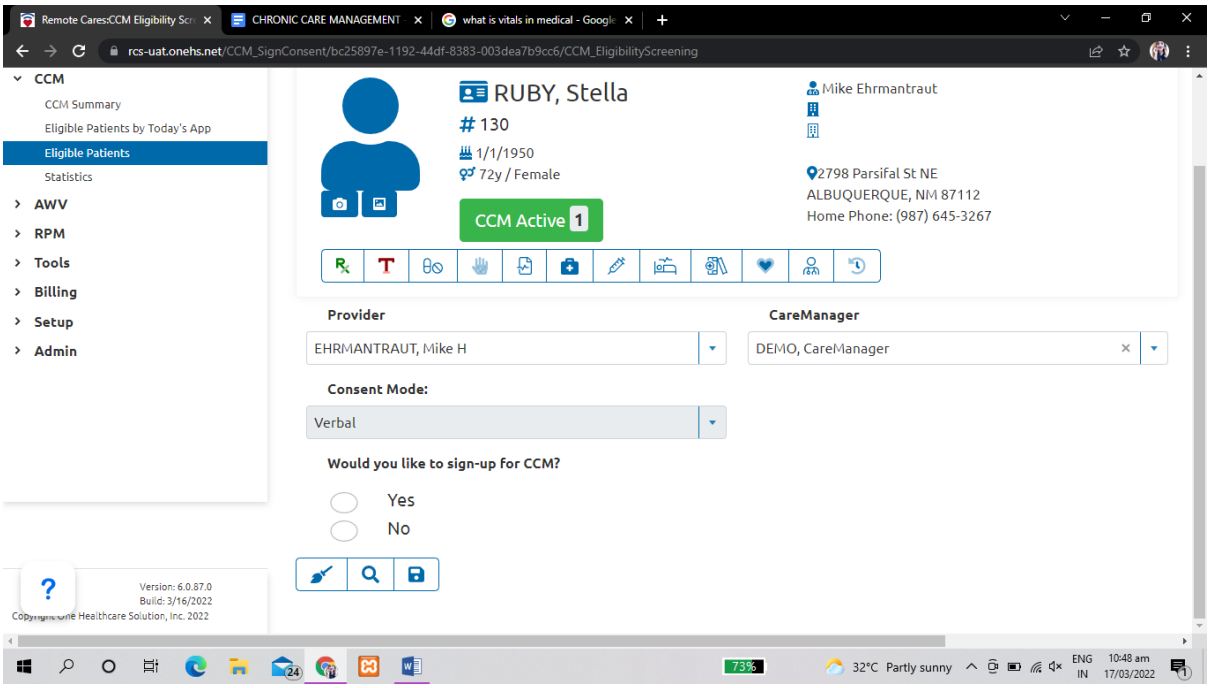


In the clinical intake, if the patient is admitted to the hospital in between the monthly checkup all the information about the patient will be included in the Hospitalizations.



Hospitalizations information will be added by clicking the new tab, we have to specify the hospitalizations type and date. Measurement of the body's most basic functions are included in vitals. If the patient has allergies, they are added in the allergies tab, in medications patients' medicine list and prescribed date will be shown, if the patient has been using any drug they are also included in medications.

In the problems section, the patient problem list and the status of the problem will be displayed, patient vaccines are listed in immunizations, if the patient had any surgery they are shown in past Surgeries.



In the Sign consent section, the patient sign will be needed in ccm. The patient has to sign for the agreement, so the patient sign has to be updated in consent mode, if they say yes to the agreement it will show two options one is verbal another one is digital. In digital patients, signs will be uploaded using a tab, otherwise the signs are directly given by the patient in verbal.

CCM SUMMARY:

Signed patient name list will be shown in ccm summary, we have to activate the ccm for those patients in the provider login. Provider will select the patient and call them for the monthly checkup. Automatically, the timer will be started, the provider will question the patient about their problem and give some tips to the patients, in the call the provider feels the patient was abnormal, then they are advised to come to the clinic. In the CCM summary activation count will be increased for every monthly call checkup and the patient list will be shown under three categories based on Duration. The provider can provide a bill for every patient by the patient call timing.

DATABASE DESCRIPTION

Eligible Patients by Today's App:

Column Name	DataType	AllowNulls
Oid	uniqueidentifier	Unchecked
Created	datetime	Checked
CreatedBy	uniqueidentifier	Checked
LastModified	datetime	Checked
ModifiedBy	uniqueidentifier	Checked
IsSynchronized	Bit	Checked
IsArchived	Bit	Checked
Encounter	uniqueidentifier	Checked
FromDate	datetime	Checked
ToDate	datetime	Checked
RequestStatus	Int	Checked
OptimisticLockField	Int	Checked
GCRecord	Int	Checked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
FromDate	datetime	Checked
ToDate	datetime	Checked
RequestStatus	Int	Checked
OptimisticLockField	Int	Checked
GCRecord	Int	Checked
Patient	uniqueidentifier	Checked

ELIGIBLE PATIENTS:

ColumnName	**DataType**	**AllowNulls**
Oid	uniqueidentifier	Unchecked
Account	nvarchar(100)	Checked
First	varchar(35)	Checked
Last	varchar(35)	Checked
Middle	varchar(35)	Checked
MobilePhone	nvarchar(100)	Checked
Email	nvarchar(100)	Checked
HomePhone	nvarchar(100)	Checked
WorkPhone	nvarchar(100)	Checked
MobilePhone	nvarchar(100)	Checked
DateOfBirth	DateTime	Checked

For Clinical Intakes:

Vitals:

ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Template	uniqueidentifier	Checked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
Systolic	Int	Checked
Diastolic	Int	Checked
SystolicSupine	Int	Checked
DiastolicSupine	Int	Checked
SystolicSitting	Int	Checked
DiastolicSitting	Int	Checked
SystolicStanding	Int	Checked
DiastolicStanding	Int	Checked
HR	Int	Checked
Respiration	Int	Checked
O2	float	Checked
O2Classification	Int	Checked
HeightMeters	float	Checked
WeightKg	float	Checked
HeadCircumference	float	Checked
OD	nvarchar(100)	Checked
OS	nvarchar(100)	Checked
OU	nvarchar(100)	Checked
CorrectionType	Int	Checked
AD	Int	Checked
[AS]	Int	Checked
LMP	datetime	Checked
BMI	float	Checked
PainScale	Int	Checked
BodyFat	float	Checked
WaistMeters	float	Checked
HipsMeters	float	Checked
BloodGlucose	float	Checked
Pulse	float	Checked
PI	float	Checked
ActivityMovement	numeric(10, 0)	Checked
FEV1	float	Checked
FVC	float	Checked

Allergy:

ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
ReactionType	Int	Checked
MedicalHistory	uniqueidentifier	Checked
Category	uniqueidentifier	Checked
Type	uniqueidentifier	Checked
Severity	uniqueidentifier	Checked
AllergyStatus	Int	Checked
ReactionDescription	nvarchar(200)	Checked
Onset	datetime	Checked
DoseSpotID	Int	Checked
Drug	uniqueidentifier	Checked
ScriptSureID	numeric(10, 0)	Checked

Medications:

Column Name	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
Category	uniqueidentifier	Checked
Drug	uniqueidentifier	Checked
Name	nvarchar(500)	Checked
MedicationStatus	int	Checked
Source	int	Checked
MedicalHistory	uniqueidentifier	Checked
InfoProvidedToPatient	bit	Checked
Started	datetime	Checked
Stopped	datetime	Checked
PrescriptionStatus	int	Checked
NoteToPharmacy	nvarchar(210)	Checked
RefillsAsNeeded	bit	Checked
RefillQuantity	numeric(5, 0)	Checked
GenericsOK	bit	Checked
FormularyChecked	bit	Checked
WrittenDate	datetime	Checked
Pharmacy	uniqueidentifier	Checked
Quantity	nvarchar(16)	Checked
LastFilled	datetime	Checked
Frequency	uniqueidentifier	Checked
Dispense	nvarchar(16)	Checked
DispenseUnit	nvarchar(100)	Checked
DaysSupply	numeric(5, 0)	Checked
PatientInstructions	nvarchar(400)	Checked
PharmacyNotes	nvarchar(210)	Checked
PrescibedBy	uniqueidentifier	Checked
DoseSpotID	int	Checked
SureScriptsMessageId	nvarchar(100)	Checked
SubstitutionsOK	bit	Checked
QuantityInt	numeric(10, 0)	Checked
[Order]	uniqueidentifier	Checked
ScriptSureID	numeric(10, 0)	Checked

Problems:

ColumnName	**DataType**	**AllowNull**
Oid	uniqueidentifier	Unchecked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
ParentChartItem	uniqueidentifier	Checked
Type	uniqueidentifier	Checked
Source	nvarchar(100)	Checked
Category	uniqueidentifier	Checked
MedicalHistory	uniqueidentifier	Checked
ProblemStatus	Int	Checked

Immunization:

Column Name	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
Type	uniqueidentifier	Checked
Route	int	Checked
Site	int	Checked
RouteOfAdministration	nvarchar(100)	Checked
AdministeredLocation	nvarchar(100)	Checked
Manufacturer	uniqueidentifier	Checked
StartOfAdministration	datetime	Checked
EndOfAdministration	datetime	Checked
AdministeredAmount	float	Checked
AdministeredUnits	uniqueidentifier	Checked
LotNumber	nvarchar(100)	Checked
ExpirationDate	datetime	Checked
ReportedToState	bit	Checked
DateReportedToState	datetime	Checked
VaccineDocumentRecipientNam	nvarchar(100)	Checked
VaccineDocumentDateProvide	datetime	Checked
VfcEligibility	int	Checked
AdministeredBy	uniqueidentifier	Checked
ImmunizationStatus	int	Checked
RefusalReason	int	Checked
ReasonDescription	nvarchar(100)	Checked
DiseaseImminuty	bigint	Checked
Protected	int	Checked

Past Surgery:

Column Name	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
PatientReportedNote	nvarchar(1000)	Checked
Date	datetime	Checked
MedicalHistory	uniqueidentifier	Checked

Hospitilization:

Column Name	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
ParentChartItem	uniqueidentifier	Checked
PatientReportedNote	nvarchar(100)	Checked
Date	datetime	Checked
Type	uniqueidentifier	Checked
Category	uniqueidentifier	Checked
MedicalHistory	uniqueidentifier	Checked

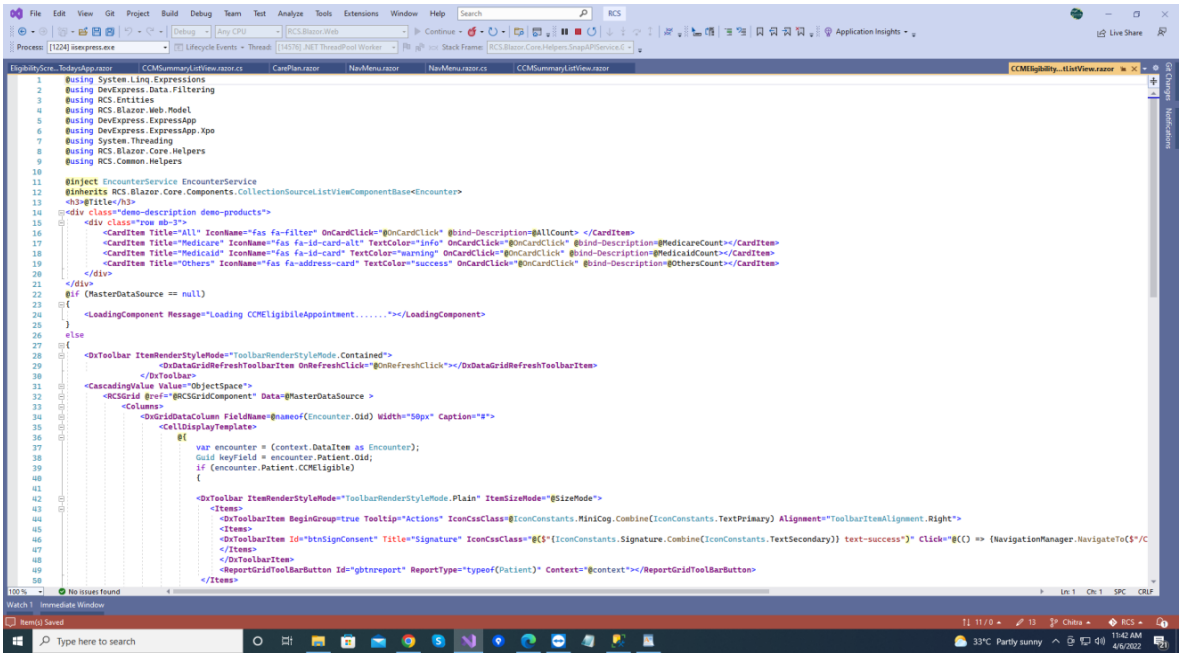
Preventive Screening:

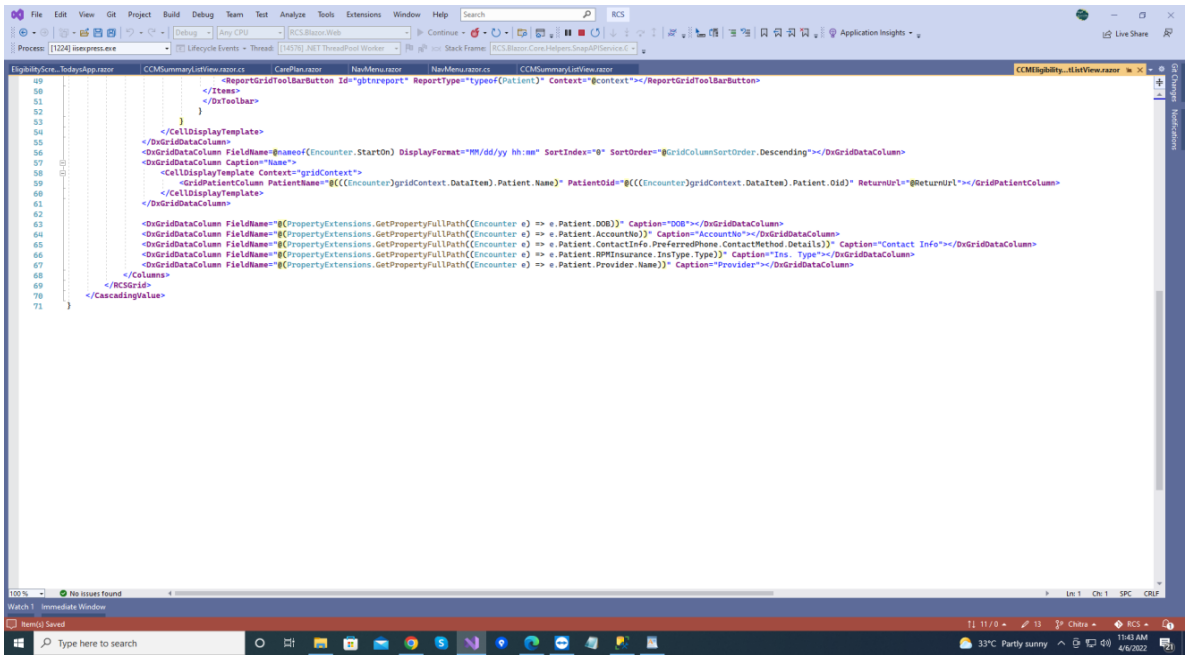
ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Created	datetime	Checked
CreatedBy	uniqueidentifier	Checked
LastModified	datetime	Checked
ModifiedBy	uniqueidentifier	Checked
IsSynchronized	bit	Checked
IsArchived	bit	Checked
PreventiveScreeningType	uniqueidentifier	Checked
HealthRiskAssessment	uniqueidentifier	Checked
NeedScreening	bit	Checked
LastCompleted	datetime	Checked
EligibilityFrom	datetime	Checked
Comments	nvarchar(100)	Checked
OptimisticLockField	int	Checked
GCRecord	int	Checked

CODE DESIGN

CCM Eligible Patients List:

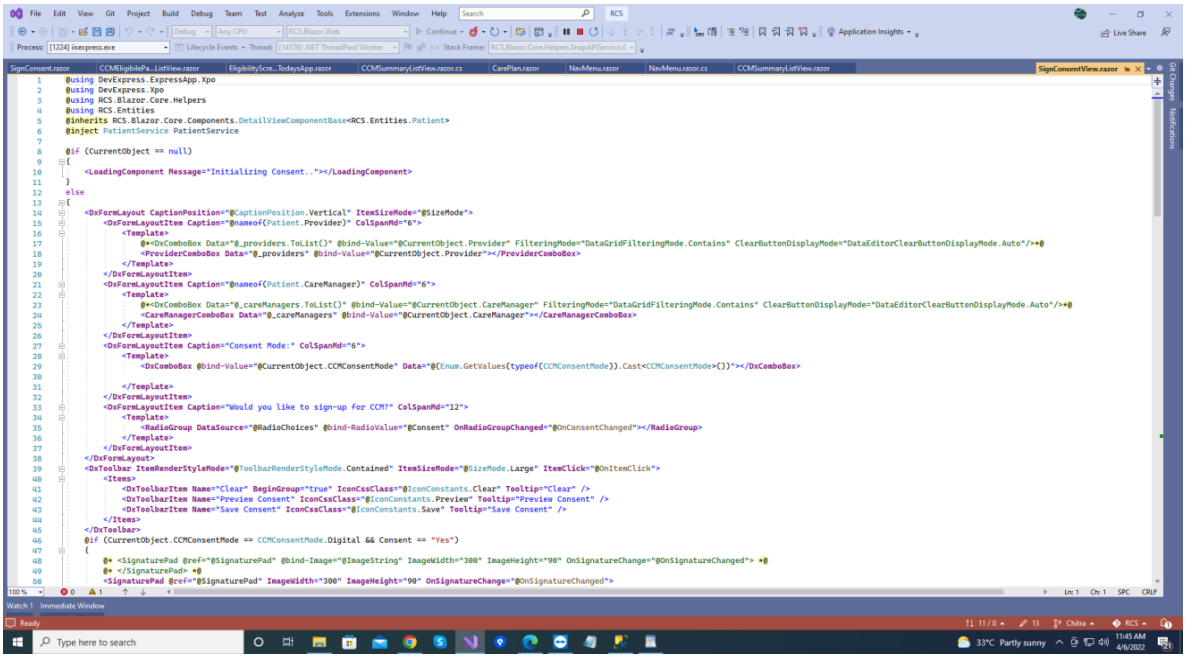
On Clicking Eligible Patients by Today's App:



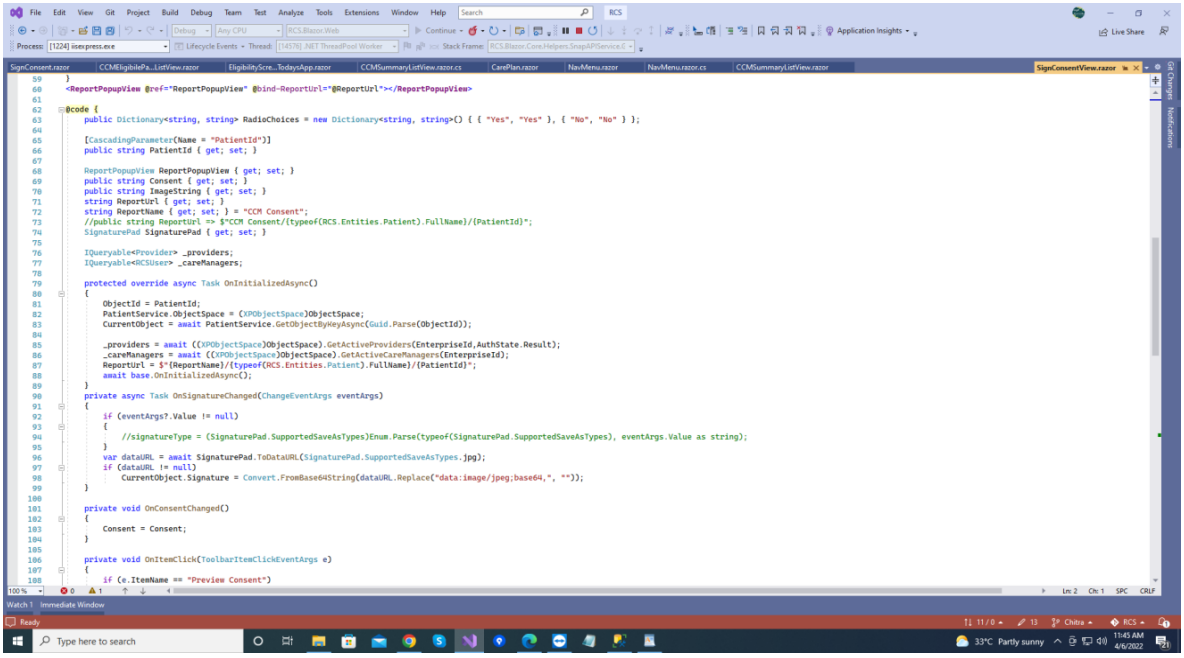


```
                                <ReportGridToolBarButton Id="gbtnreport" ReportType="typeof(Patient)" Context="@context"></ReportGridToolBarButton>
                            </Items>
                            </DxToolbar>
                        )
                    }
                </CellDisplayTemplate>
            </DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Encounter.StartOn) DisplayFormat="MM/dd/yy hh:mm" SortIndex="0" SortOrder="@GridColumnSortOrder.Descending"></DxGridDataColumn>
            <DxGridDataColumn Caption="Name">
                <CellDisplayTemplate Context="gridContext">
                    <GridPatientColumn PatientName="@(((Encounter)gridContext.DataItem).Patient.Name)" PatientOid="@(((Encounter)gridContext.DataItem).Patient.Oid)" ReturnUrl="@ReturnUrl"></GridPatientColumn>
                </CellDisplayTemplate>
            </DxGridDataColumn>

            <DxGridDataColumn FieldName="@(PropertyExtensions.GetPropertyFullPath((Encounter e) => e.Patient.DOB))" Caption="DOB"></DxGridDataColumn>
            <DxGridDataColumn FieldName="@(PropertyExtensions.GetPropertyFullPath((Encounter e) => e.Patient.AccountNo))" Caption="AccountNo"></DxGridDataColumn>
            <DxGridDataColumn FieldName="@(PropertyExtensions.GetPropertyFullPath((Encounter e) => e.Patient.ContactInfo.PreferredPhone.ContactMethod.Details))" Caption="Contact Info"></DxGridDataColumn>
            <DxGridDataColumn FieldName="@(PropertyExtensions.GetPropertyFullPath((Encounter e) => e.Patient.RPMInsurance.InsType.Type))" Caption="Ins. Type"></DxGridDataColumn>
            <DxGridDataColumn FieldName="@(PropertyExtensions.GetPropertyFullPath((Encounter e) => e.Patient.Provider.Name))" Caption="Provider"></DxGridDataColumn>
        </Columns>
    </RCSGrid>
</CascadingValue>
}
```

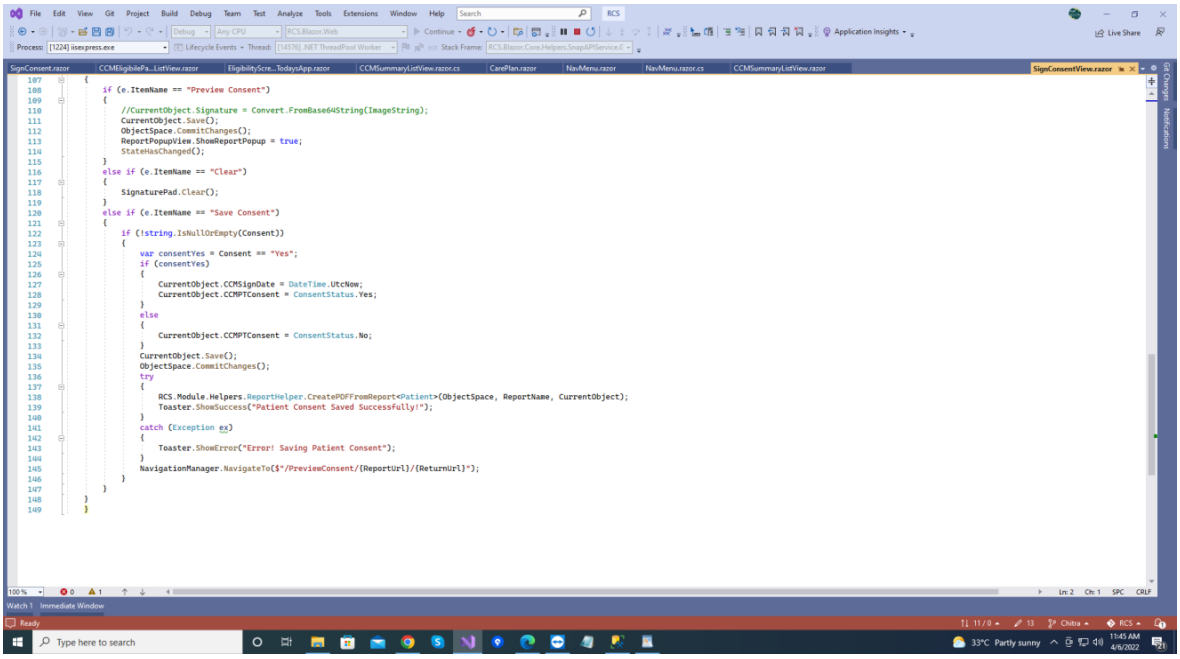
On clicking Signature:



```
@using DevExpress.ExpressApp.Xpo
@using DevExpress.Xpo
@using RCS.Blazor.Core.Helpers
@using RCS.Entities
@inherits RCS.Blazor.Core.Components.DetailViewComponentBase<RCS.Entities.Patient>
@inject PatientService PatientService

@if (CurrentObject == null)
{
    <LoadingComponent Message="Initializing Consent.."></LoadingComponent>
}
else
{
    <DxFormLayout CaptionPosition="@CaptionPosition.Vertical" ItemSizeMode="@SizeMode">
        <DxFormLayoutItem Caption="@nameof(Patient.Provider)" ColSpanMd="6">
            <Template>
                @*<DxComboBox Data="@_providers.ToList()" @bind-Value="@CurrentObject.Provider" FilteringMode="DataGridFilteringMode.Contains" ClearButtonDisplayMode="DataEditorClearButtonDisplayMode.Auto"/>*@
                <ProviderComboBox Data="@_providers" @bind-Value="@CurrentObject.Provider"></ProviderComboBox>
            </Template>
        </DxFormLayoutItem>
        <DxFormLayoutItem Caption="@nameof(Patient.CareManager)" ColSpanMd="6">
            <Template>
                @*<DxComboBox Data="@_careManagers.ToList()" @bind-Value="@CurrentObject.CareManager" FilteringMode="DataGridFilteringMode.Contains" ClearButtonDisplayMode="DataEditorClearButtonDisplayMode.Auto"/>*@
                <CareManagerComboBox Data="@_careManagers" @bind-Value="@CurrentObject.CareManager"></CareManagerComboBox>
            </Template>
        </DxFormLayoutItem>
        <DxFormLayoutItem Caption="Consent Mode:" ColSpanMd="6">
            <Template>
                <DxComboBox @bind-Value="@CurrentObject.CCMConsentMode" Data="@(Enum.GetValues(typeof(CCMConsentMode)).Cast<CCMConsentMode>())"></DxComboBox>

            </Template>
        </DxFormLayoutItem>
        <DxFormLayoutItem Caption="Would you like to sign-up for CCM?" ColSpanMd="12">
            <Template>
                <RadioGroup DataSource="@RadioChoices" @bind-RadioValue="@Consent" OnRadioGroupChanged="@OnConsentChanged"></RadioGroup>
            </Template>
        </DxFormLayoutItem>
    </DxFormLayout>
    <DxToolbar ItemRenderStyleMode="@ToolbarRenderStyleMode.Contained" ItemSizeMode="@SizeMode.Large" ItemClick="@OnItemClick">
        <Items>
            <DxToolbarItem Name="Clear" BeginGroup="true" IconCssClass="@IconConstants.Clear" Tooltip="Clear" />
            <DxToolbarItem Name="Preview Consent" IconCssClass="@IconConstants.Preview" Tooltip="Preview Consent" />
            <DxToolbarItem Name="Save Consent" IconCssClass="@IconConstants.Save" Tooltip="Save Consent" />
        </Items>
    </DxToolbar>
    @if (CurrentObject.CCMConsentMode == CCMConsentMode.Digital && Consent == "Yes")
    {
        @* <SignaturePad @ref="@SignaturePad" @bind-Image="@ImageString" ImageWidth="300" ImageHeight="90" OnSignatureChange="@OnSignatureChanged"> *@
        @* </SignaturePad> *@
        <SignaturePad @ref="@SignaturePad" ImageWidth="300" ImageHeight="90" OnSignatureChange="@OnSignatureChanged">
```

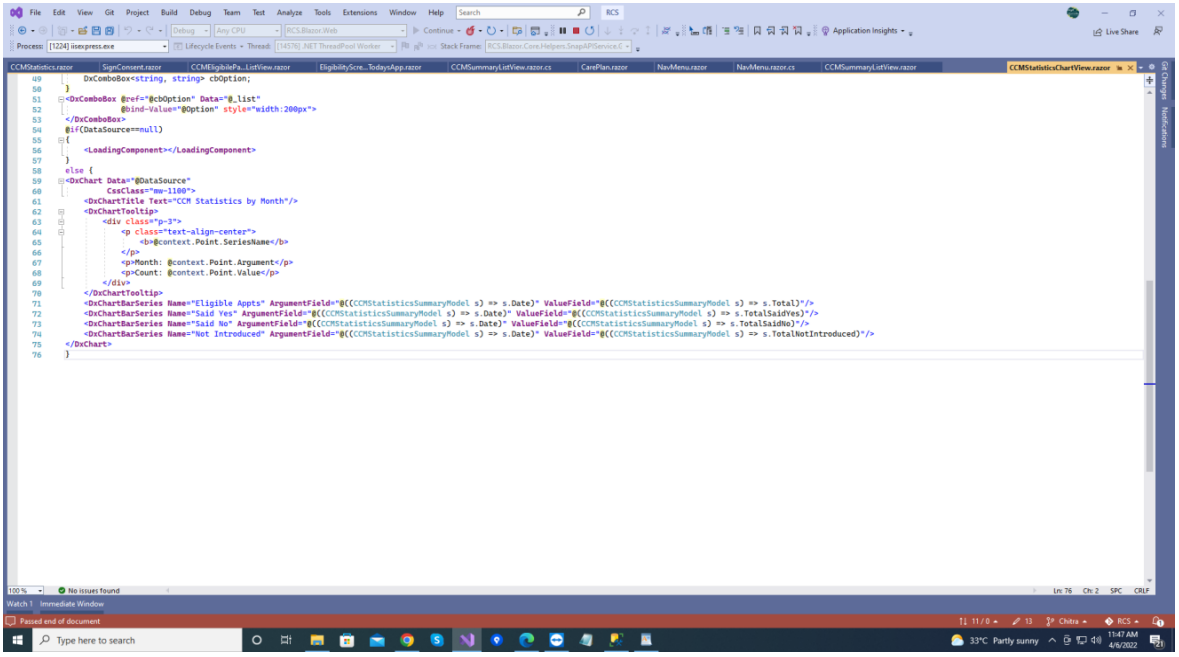


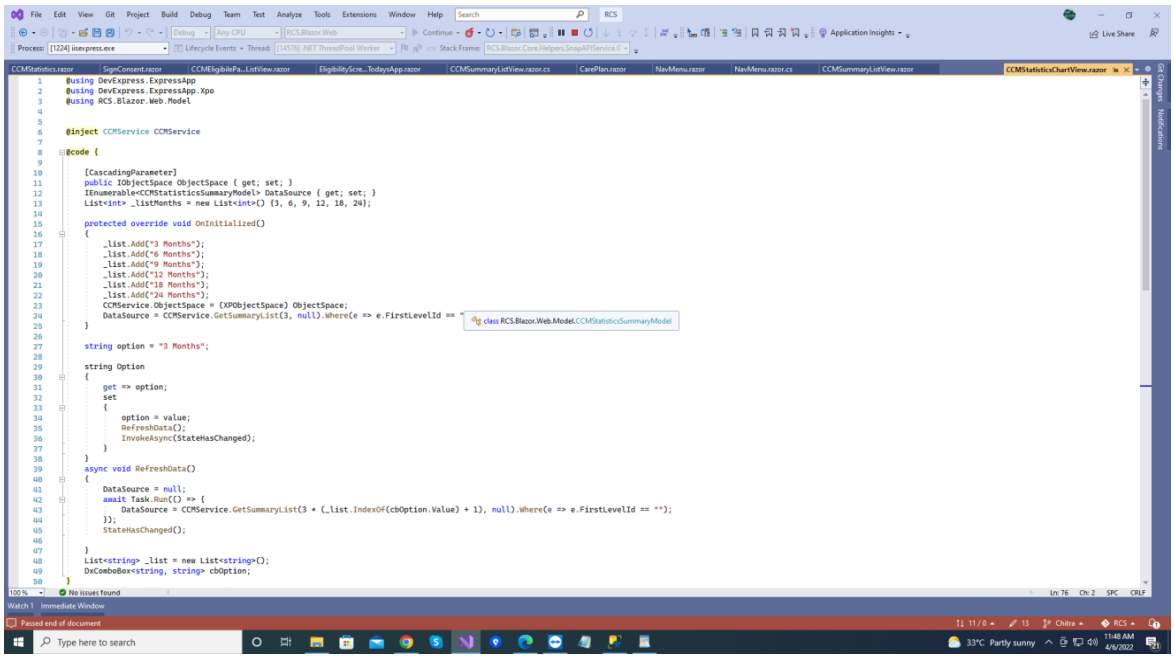
```
    }
    <ReportPopupView @ref="ReportPopupView" @bind-ReportUrl="@ReportUrl"></ReportPopupView>

@code {
    public Dictionary<string, string> RadioChoices = new Dictionary<string, string>() { { "Yes", "Yes" }, { "No", "No" } };

    [CascadingParameter(Name = "PatientId")]
    public string PatientId { get; set; }

    ReportPopupView ReportPopupView { get; set; }
    public string Consent { get; set; }
    public string ImageString { get; set; }
    string ReportUrl { get; set; }
    string ReportName { get; set; } = "CCM Consent";
    //public string ReportUrl => $"CCM Consent/{typeof(RCS.Entities.Patient).FullName}/{PatientId}";
    SignaturePad SignaturePad { get; set; }

    IQueryable<Provider> _providers;
    IQueryable<RCSUser> _careManagers;

    protected override async Task OnInitializedAsync()
    {
        ObjectId = PatientId;
        PatientService.ObjectSpace = (XPObjectSpace)ObjectSpace;
        CurrentObject = await PatientService.GetObjectByKeyAsync(Guid.Parse(ObjectId));

        _providers = await ((XPObjectSpace)ObjectSpace).GetActiveProviders(EnterpriseId,AuthState.Result);
        _careManagers = await ((XPObjectSpace)ObjectSpace).GetActiveCareManagers(EnterpriseId);
        ReportUrl = $"{ReportName}/{typeof(RCS.Entities.Patient).FullName}/{PatientId}";
        await base.OnInitializedAsync();
    }
    private async Task OnSignatureChanged(ChangeEventArgs eventArgs)
    {
        if (eventArgs?.Value != null)
        {
            //signatureType = (SignaturePad.SupportedSaveAsTypes)Enum.Parse(typeof(SignaturePad.SupportedSaveAsTypes), eventArgs.Value as string);
        }
        var dataURL = await SignaturePad.ToDataURL(SignaturePad.SupportedSaveAsTypes.jpg);
        if (dataURL != null)
            CurrentObject.Signature = Convert.FromBase64String(dataURL.Replace("", ""));
    }

    private void OnConsentChanged()
    {
        Consent = Consent;
    }

    private void OnItemClick(ToolbarItemClickEventArgs e)
    {
        if (e.ItemName == "Preview Consent")
```



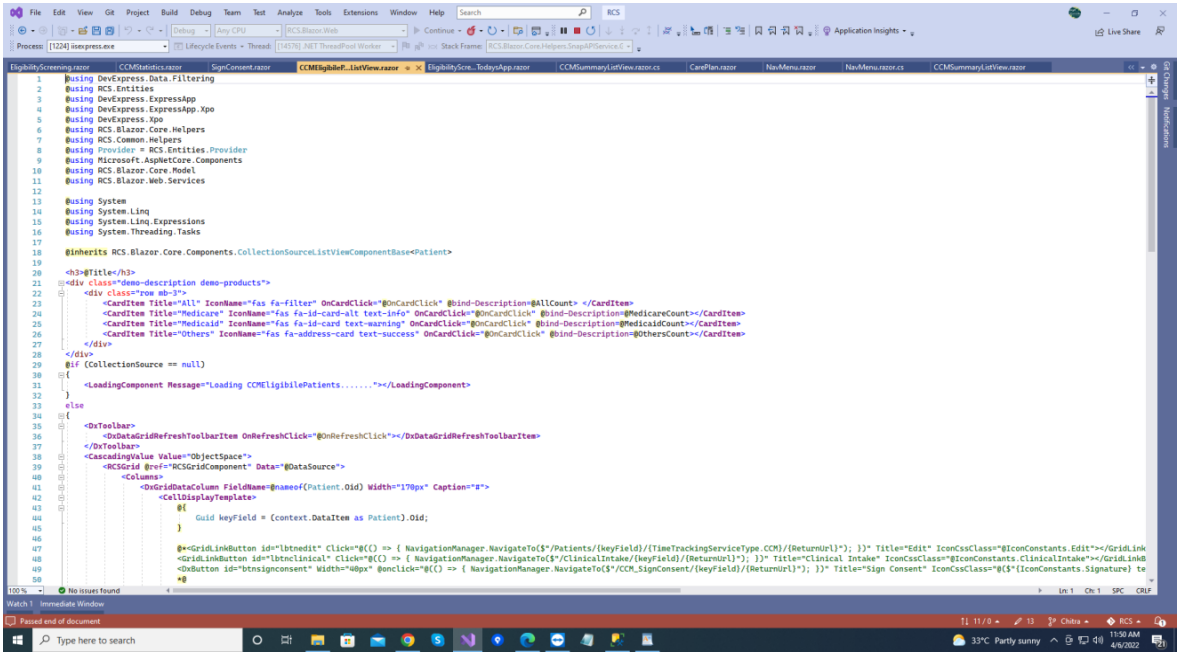
```
    {
        if (e.ItemName == "Preview Consent")
        {
            //CurrentObject.Signature = Convert.FromBase64String(ImageString);
            CurrentObject.Save();
            ObjectSpace.CommitChanges();
            ReportPopupView.ShowReportPopup = true;
            StateHasChanged();
        }
        else if (e.ItemName == "Clear")
        {
            SignaturePad.Clear();
        }
        else if (e.ItemName == "Save Consent")
        {
            if (!string.IsNullOrEmpty(Consent))
            {
                var consentYes = Consent == "Yes";
                if (consentYes)
                {
                    CurrentObject.CCMSignDate = DateTime.UtcNow;
                    CurrentObject.CCMPTConsent = ConsentStatus.Yes;
                }
                else
                {
                    CurrentObject.CCMPTConsent = ConsentStatus.No;
                }
                CurrentObject.Save();
                ObjectSpace.CommitChanges();
                try
                {
                    RCS.Module.Helpers.ReportHelper.CreatePDFFromReport<Patient>(ObjectSpace, ReportName, CurrentObject);
                    Toaster.ShowSuccess("Patient Consent Saved SuccessFully!");
                }
                catch (Exception ex)
                {
                    Toaster.ShowError("Error! Saving Patient Consent");
                }
                NavigationManager.NavigateTo($"/PreviewConsent/{ReportUrl}/{ReturnUrl}");
            }
        }
    }
}
```

On clicking Statistics:

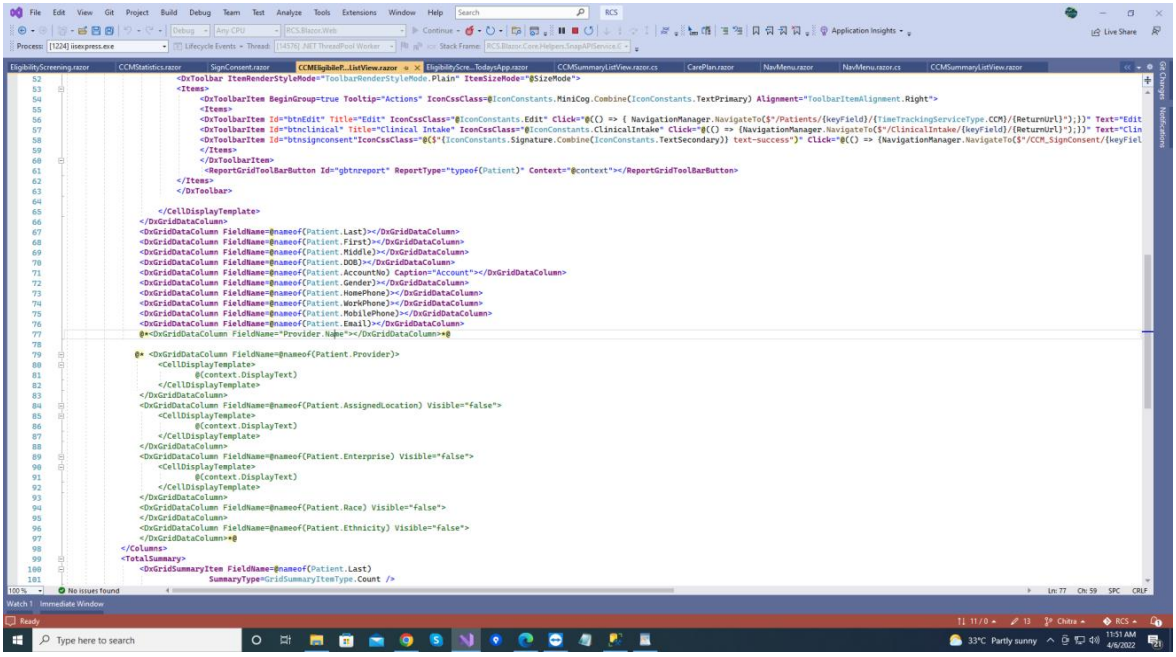




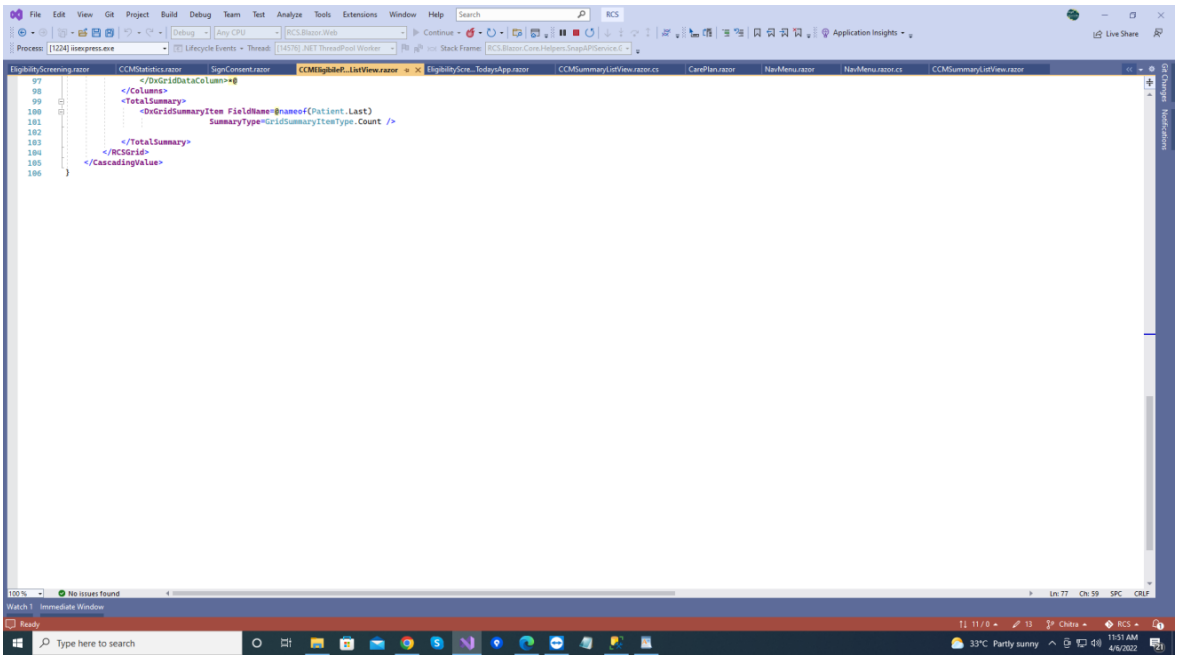
On Clicking Eligible Patient Lists:



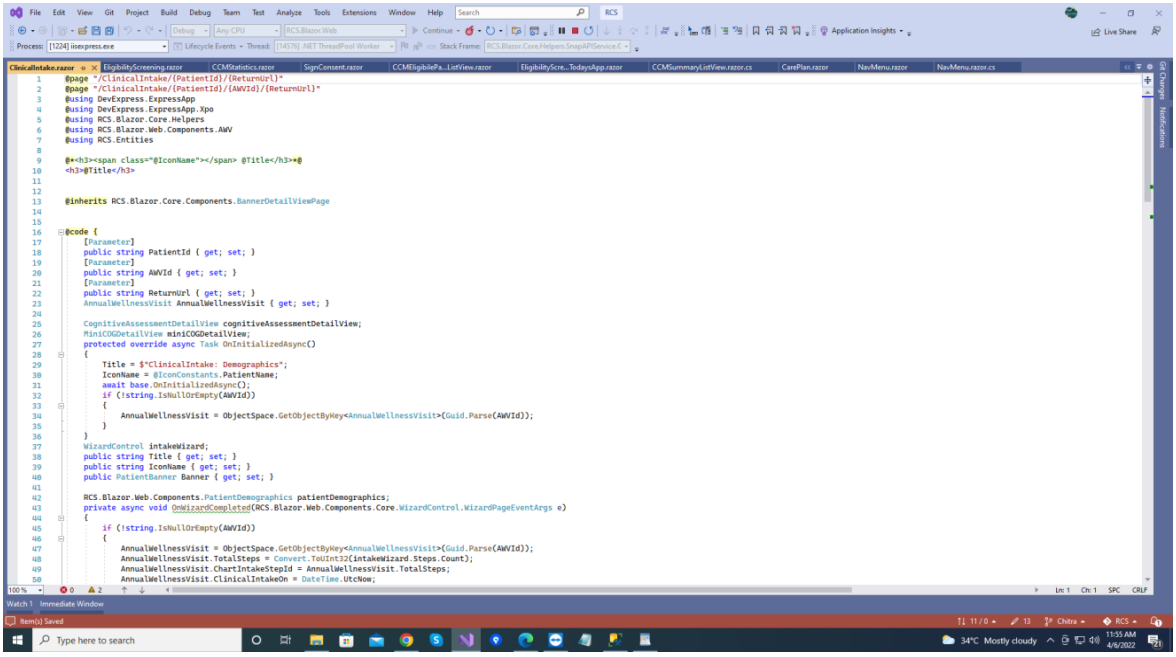
```
@using DevExpress.Data.Filtering
@using RCS.Entities
@using DevExpress.ExpressApp
@using DevExpress.ExpressApp.Xpo
@using DevExpress.Xpo
@using RCS.Blazor.Core.Helpers
@using RCS.Common.Helpers
@using Provider = RCS.Entities.Provider
@using Microsoft.AspNetCore.Components
@using RCS.Blazor.Core.Model
@using RCS.Blazor.Web.Services

@using System
@using System.Linq
@using System.Linq.Expressions
@using System.Threading.Tasks

@inherits RCS.Blazor.Core.Components.CollectionSourceListViewComponentBase<Patient>

<h3>@Title</h3>
<div class="demo-description demo-products">
    <div class="row mb-3">
        <CardItem Title="All" IconName="fas fa-filter" OnCardClick="@OnCardClick" @bind-Description=@AllCount> </CardItem>
        <CardItem Title="Medicare" IconName="fas fa-id-card-alt text-info" OnCardClick="@OnCardClick" @bind-Description=@MedicareCount></CardItem>
        <CardItem Title="Medicaid" IconName="fas fa-id-card text-warning" OnCardClick="@OnCardClick" @bind-Description=@MedicaidCount></CardItem>
        <CardItem Title="Others" IconName="fas fa-address-card text-success" OnCardClick="@OnCardClick" @bind-Description=@OthersCount></CardItem>
    </div>
</div>
@if (CollectionSource == null)
{
    <LoadingComponent Message="Loading CCMEligibilePatients......."></LoadingComponent>
}
else
{
    <DxToolbar>
        <DxDataGridRefreshToolbarItem OnRefreshClick="@OnRefreshClick"></DxDataGridRefreshToolbarItem>
    </DxToolbar>
    <CascadingValue Value="ObjectSpace">
        <RCSGrid @ref="RCSGridComponent" Data="@DataSource">
            <Columns>
                <DxGridDataColumn FieldName=@nameof(Patient.Oid) Width="170px" Caption="#">
                    <CellDisplayTemplate>
                        @{
                            Guid keyField = (context.DataItem as Patient).Oid;
                        }

                        @*<GridLinkButton id="lbtnedit" Click="@(() => { NavigationManager.NavigateTo($"/Patients/{keyField}/{TimeTrackingServiceType.CCM}/{ReturnUrl}"); })" Title="Edit" IconCssClass="@IconConstants.Edit"></GridLink
                        <GridLinkButton id="lbtnclinical" Click="@(() => { NavigationManager.NavigateTo($"/ClinicalIntake/{keyField}/{ReturnUrl}"); })" Title="Clinical Intake" IconCssClass="@IconConstants.ClinicalIntake"></GridLinkB
                        <DxButton id="btnsigncons" Width="40px" @onclick="@(() => { NavigationManager.NavigateTo($"/CCM_SignConsent/{keyField}/{ReturnUrl}"); })" Title="Sign Consent" IconCssClass="@($"{IconConstants.Signature} te
                        *@
```



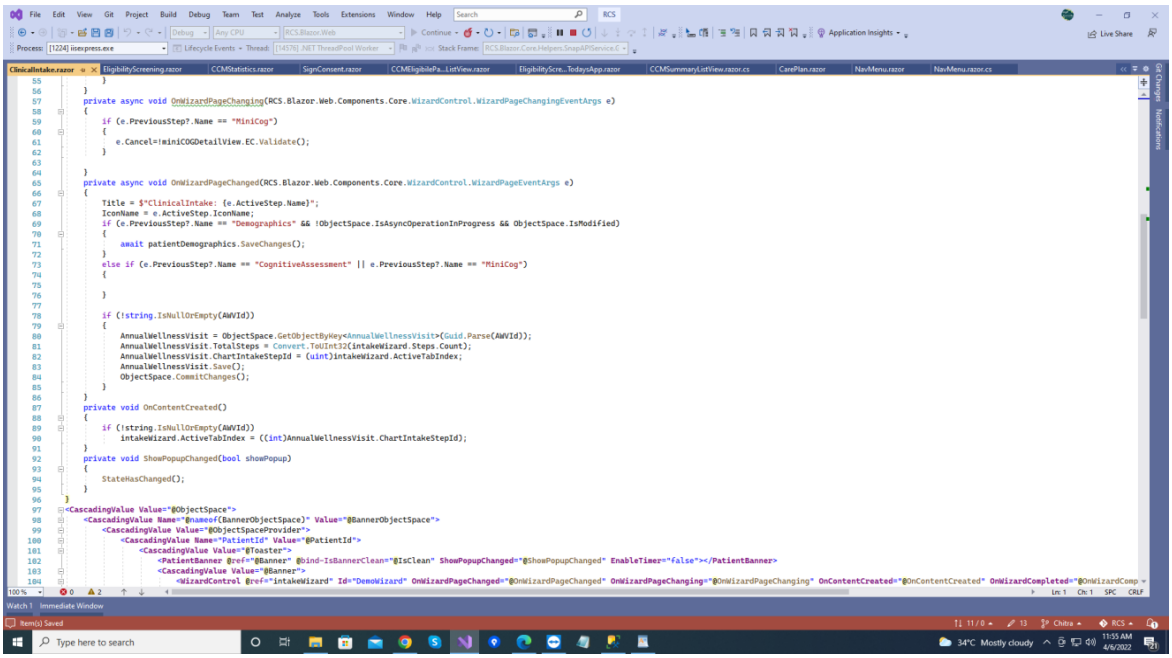
```
                    <DxToolbar ItemRenderStyleMode="ToolbarRenderStyleMode.Plain" ItemSizeMode="@SizeMode">
                    <Items>
                        <DxToolbarItem BeginGroup=true Tooltip="Actions" IconCssClass=@IconConstants.MiniCog.Combine(IconConstants.TextPrimary) Alignment="ToolbarItemAlignment.Right">
                        <Items>
                        <DxToolbarItem Id="btnEdit" Title="Edit" IconCssClass="@IconConstants.Edit" Click="@(() => { NavigationManager.NavigateTo($"/Patients/{keyField}/{TimeTrackingServiceType.CCM}/{ReturnUrl}");})" Text="Edit
                        <DxToolbarItem Id="btnclinical" Title="Clinical Intake" IconCssClass="@IconConstants.ClinicalIntake" Click="@(() => {NavigationManager.NavigateTo($"/ClinicalIntake/{keyField}/{ReturnUrl}");})" Text="Clin
                        <DxToolbarItem Id="btnsigncons"IconCssClass="@($"{IconConstants.Signature.Combine(IconConstants.TextSecondary)} text-success")" Click="@(() => {NavigationManager.NavigateTo($"/CCM_SignConsent/{keyFiel
                        </Items>
                        </DxToolbarItem>
                         <ReportGridToolBarButton Id="gbtnreport" ReportType="typeof(Patient)" Context="@context"></ReportGridToolBarButton>
                    </Items>
                    </DxToolbar>

                </CellDisplayTemplate>
            </DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.Last)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.First)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.Middle)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.DOB)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.AccountNo) Caption="Account"></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.Gender)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.HomePhone)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.WorkPhone)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.MobilePhone)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.Email)></DxGridDataColumn>
            @*<DxGridDataColumn FieldName="Provider.Name"></DxGridDataColumn>*@

            @* <DxGridDataColumn FieldName=@nameof(Patient.Provider)>
                <CellDisplayTemplate>
                    @(context.DisplayText)
                </CellDisplayTemplate>
            </DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.AssignedLocation) Visible="false">
                <CellDisplayTemplate>
                    @(context.DisplayText)
                </CellDisplayTemplate>
            </DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.Enterprise) Visible="false">
                <CellDisplayTemplate>
                    @(context.DisplayText)
                </CellDisplayTemplate>
            </DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.Race) Visible="false">
            </DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(Patient.Ethnicity) Visible="false">
            </DxGridDataColumn>*@
        </Columns>
        <TotalSummary>
            <DxGridSummaryItem FieldName=@nameof(Patient.Last)
                               SummaryType=GridSummaryItemType.Count />
```


File Edit View Git Project Build Debug Team Test Analyze Tools Extensions Window Help
Search
RCS
Live Share
Application Insights
EligibilityScreening.razor
CCMStatistics.razor
SignConsent.razor
CCMEligibileP...ListView.razor
EligibilityScre...TodaysApp.razor
CCMSummaryListView.razor.cs
CarePlan.razor
NavMenu.razor
NavMenu.razor.cs
CCMSummaryListView.razor
97 </DxGridDataColumn>*@
98 </Columns>
99 <TotalSummary>
100 <DxGridSummaryItem FieldName=@nameof(Patient.Last)
101 SummaryType="GridSummaryItemType.Count" />
102
103 </TotalSummary>
104 </RCSGrid>
105 </CascadingValue>
106 }
No issues found
Ln: 77 Ch: 59 SPC CRLF
Watch 1 Immediate Window
Ready
Type here to search
33°C Partly sunny
11:51 AM
4/6/2022

On Clicking Clinical Intake:



```
@page "/ClinicalIntake/{PatientId}/{ReturnUrl}"
@page "/ClinicalIntake/{PatientId}/{AWVId}/{ReturnUrl}"
@using DevExpress.ExpressApp
@using DevExpress.ExpressApp.Xpo
@using RCS.Blazor.Core.Helpers
@using RCS.Blazor.Web.Components.AWV
@using RCS.Entities

@*<h3><span class="@IconName"></span> @Title</h3>*@
<h3>@Title</h3>


@inherits RCS.Blazor.Core.Components.BannerDetailViewPage


@code {
    [Parameter]
    public string PatientId { get; set; }
    [Parameter]
    public string AWVId { get; set; }
    [Parameter]
    public string ReturnUrl { get; set; }
    AnnualWellnessVisit AnnualWellnessVisit { get; set; }

    CognitiveAssessmentDetailView cognitiveAssessmentDetailView;
    MiniCOGDetailView miniCOGDetailView;
    protected override async Task OnInitializedAsync()
    {
        Title = $"ClinicalIntake: Demographics";
        IconName = @IconConstants.PatientName;
        await base.OnInitializedAsync();
        if (!string.IsNullOrEmpty(AWVId))
        {
            AnnualWellnessVisit = ObjectSpace.GetObjectByKey<AnnualWellnessVisit>(Guid.Parse(AWVId));
        }
    }
    WizardControl intakeWizard;
    public string Title { get; set; }
    public string IconName { get; set; }
    public PatientBanner Banner { get; set; }

    RCS.Blazor.Web.Components.PatientDemographics patientDemographics;
    private async void OnWizardCompleted(RCS.Blazor.Web.Components.Core.WizardControl.WizardPageEventArgs e)
    {
        if (!string.IsNullOrEmpty(AWVId))
        {
            AnnualWellnessVisit = ObjectSpace.GetObjectByKey<AnnualWellnessVisit>(Guid.Parse(AWVId));
            AnnualWellnessVisit.TotalSteps = Convert.ToUInt32(intakeWizard.Steps.Count);
            AnnualWellnessVisit.ChartIntakeStepId = AnnualWellnessVisit.TotalSteps;
            AnnualWellnessVisit.ClinicalIntakeOn = DateTime.UtcNow;
```



```
    }
    private async void OnWizardPageChanging(RCS.Blazor.Web.Components.Core.WizardControl.WizardPageChangingEventArgs e)
    {
        if (e.PreviousStep?.Name == "MiniCog")
        {
            e.Cancel=!miniCOGDetailView.EC.Validate();
        }

    }
    private async void OnWizardPageChanged(RCS.Blazor.Web.Components.Core.WizardControl.WizardPageEventArgs e)
    {
        Title = $"ClinicalIntake: {e.ActiveStep.Name}";
        IconName = e.ActiveStep.IconName;
        if (e.PreviousStep?.Name == "Demographics" && !ObjectSpace.IsAsyncOperationInProgress && ObjectSpace.IsModified)
        {
            await patientDemographics.SaveChanges();
        }
        else if (e.PreviousStep?.Name == "CognitiveAssessment" || e.PreviousStep?.Name == "MiniCog")
        {

        }

        if (!string.IsNullOrEmpty(AWVId))
        {
            AnnualWellnessVisit = ObjectSpace.GetObjectByKey<AnnualWellnessVisit>(Guid.Parse(AWVId));
            AnnualWellnessVisit.TotalSteps = Convert.ToUInt32(intakeWizard.Steps.Count);
            AnnualWellnessVisit.ChartIntakeStepId = (uint)intakeWizard.ActiveTabIndex;
            AnnualWellnessVisit.Save();
            ObjectSpace.CommitChanges();
        }
    }
    private void OnContentCreated()
    {
        if (!string.IsNullOrEmpty(AWVId))
            intakeWizard.ActiveTabIndex = ((int)AnnualWellnessVisit.ChartIntakeStepId);
    }
    private void ShowPopupChanged(bool showPopup)
    {
        StateHasChanged();
    }
}
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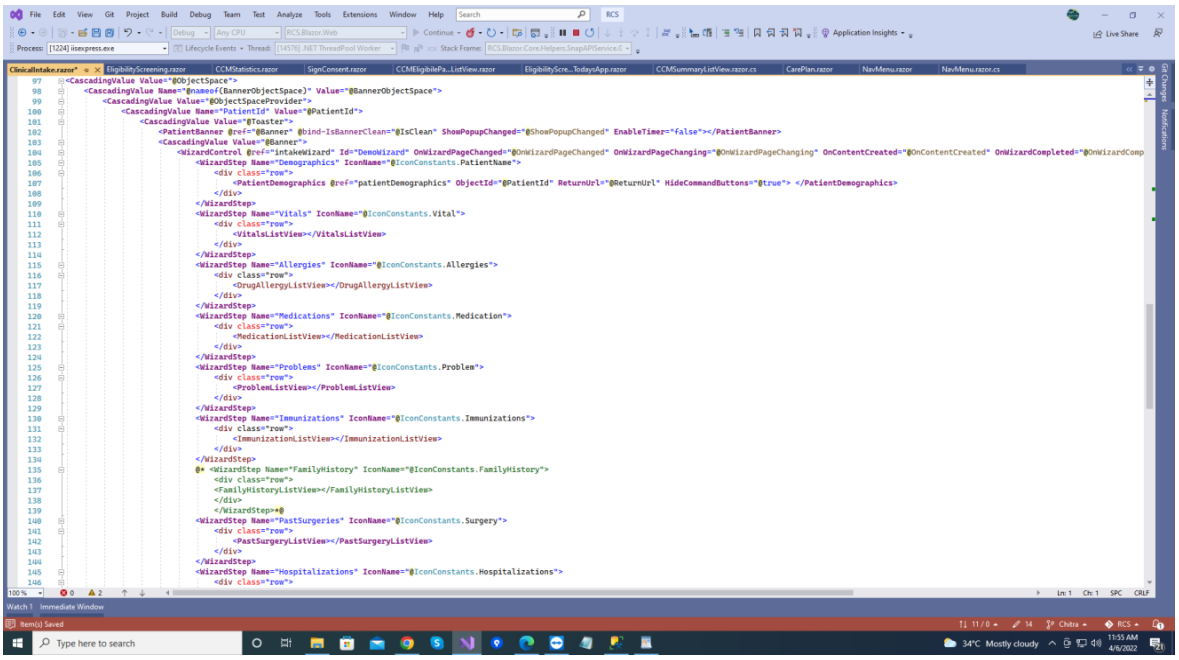

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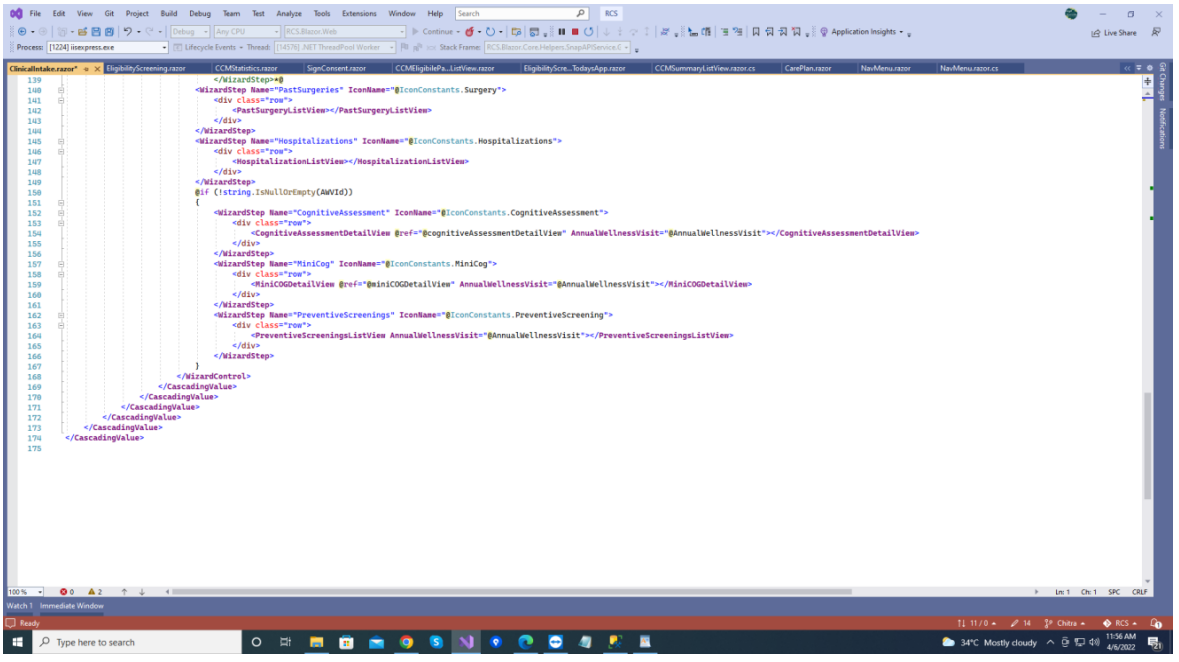

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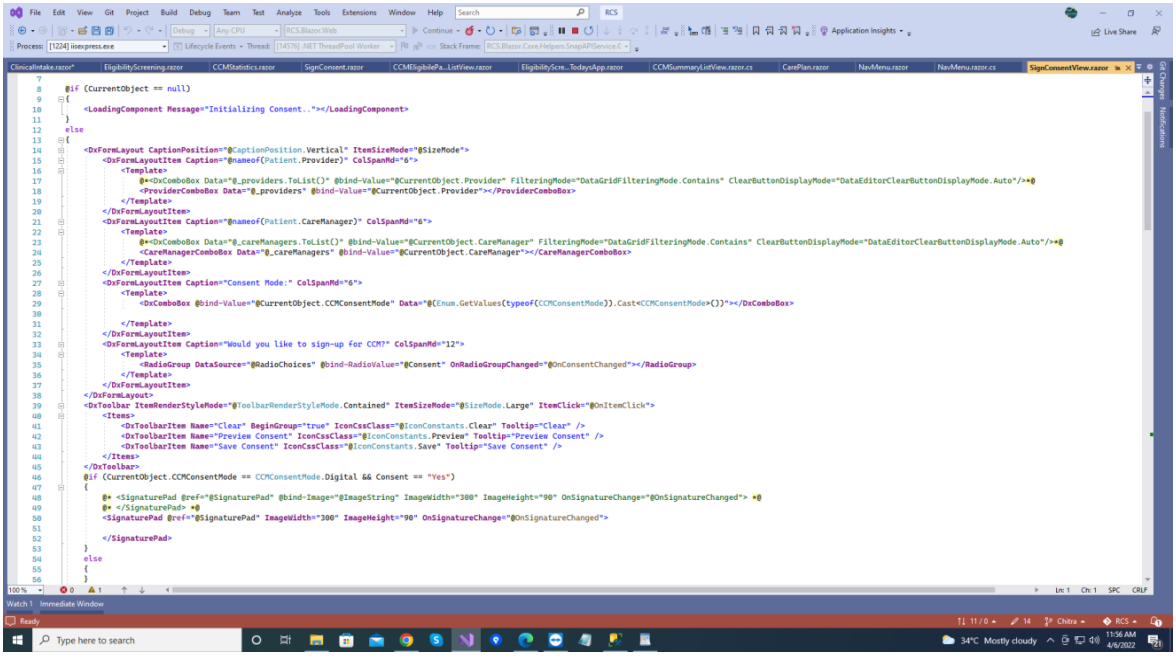

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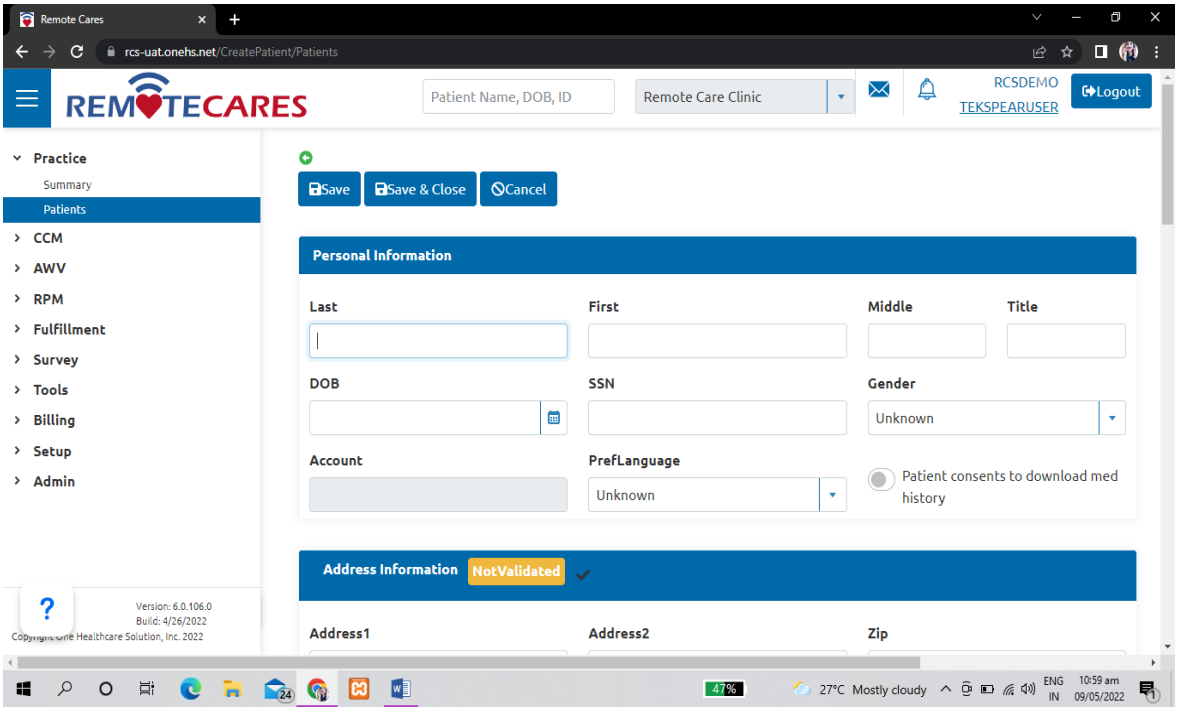
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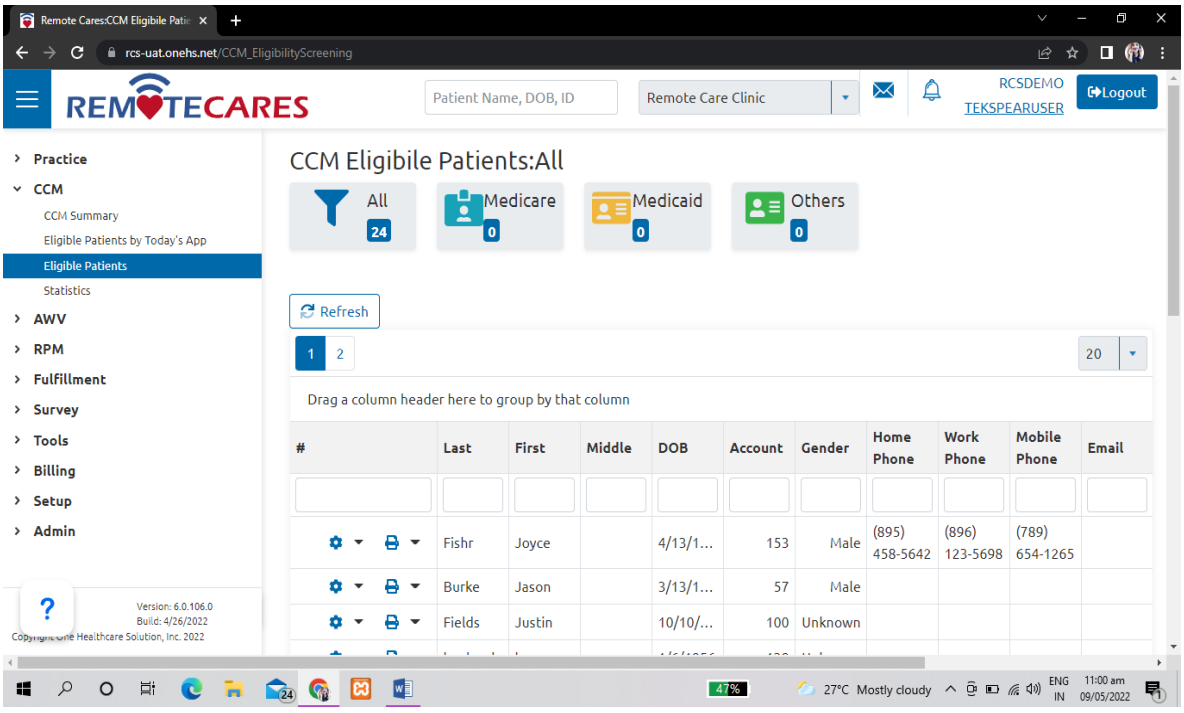
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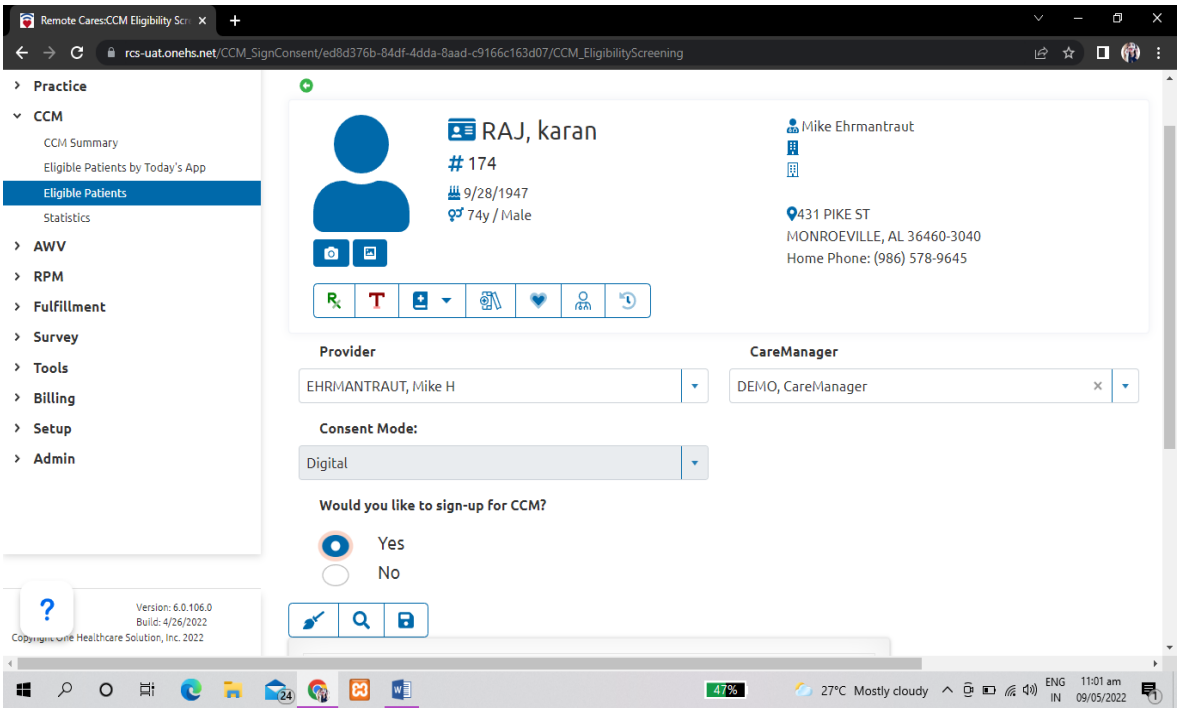
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RAJ, karan
174
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74y / Male
Mike Ehrmantraut
431 PIKE ST
MONROEVILLE, AL 36460-3040
Home Phone: (986) 578-9645
Provider
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CareManager
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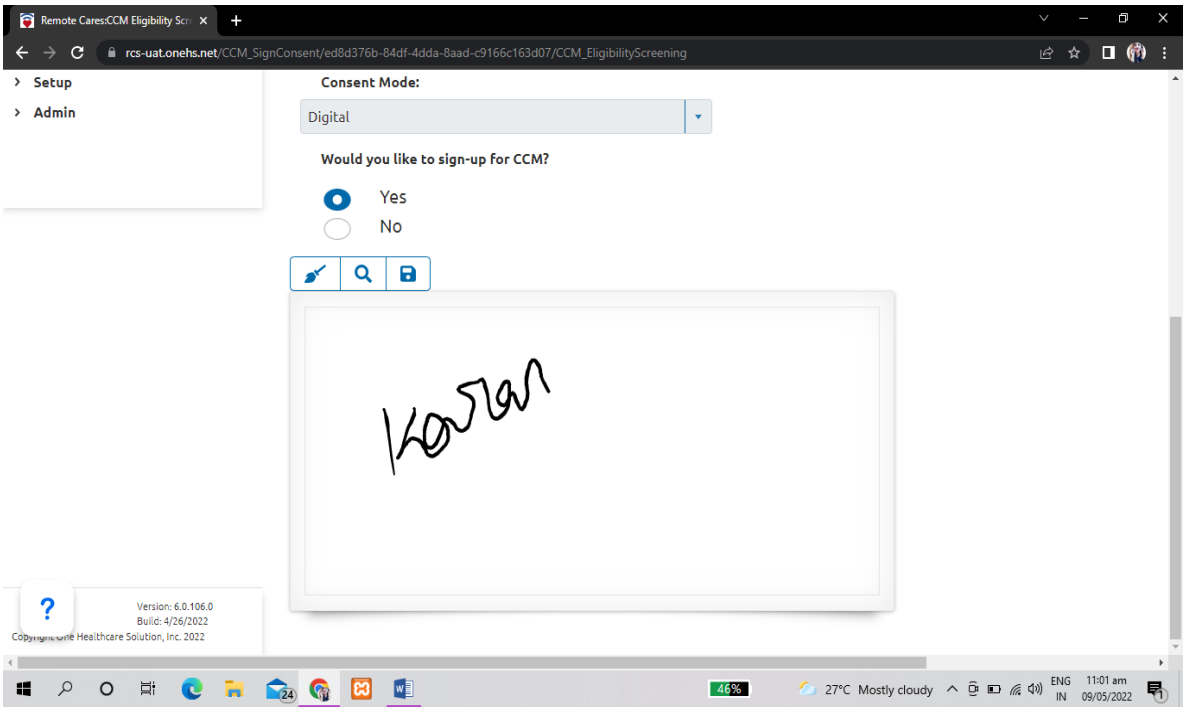
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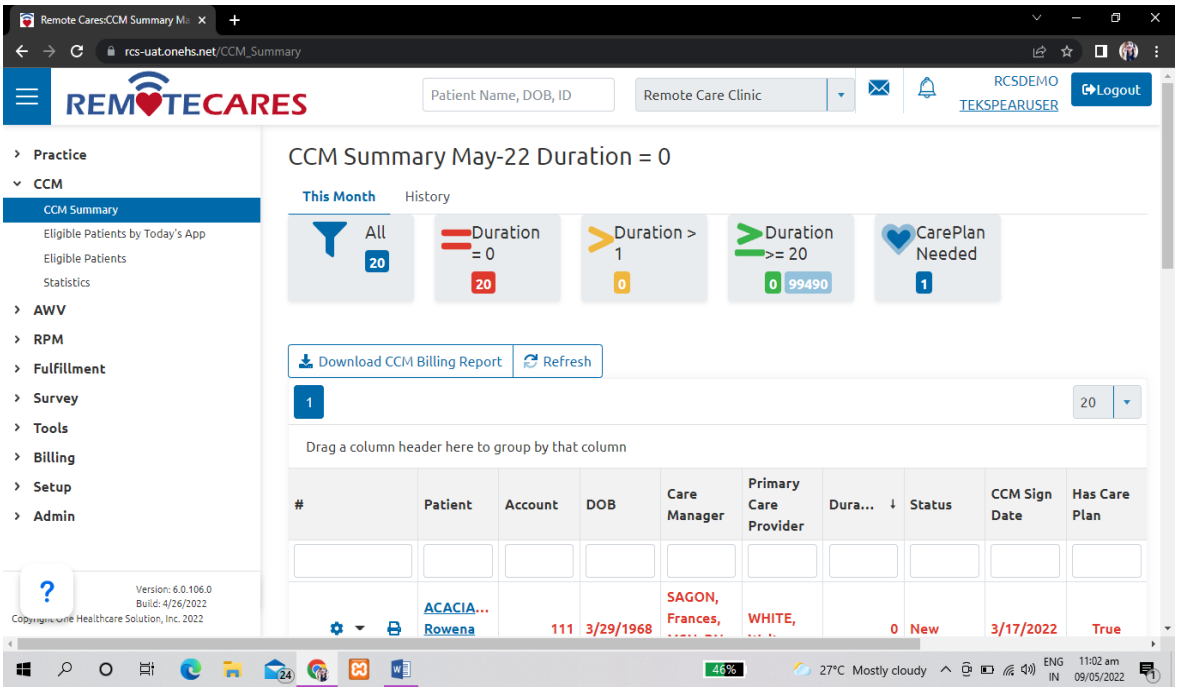
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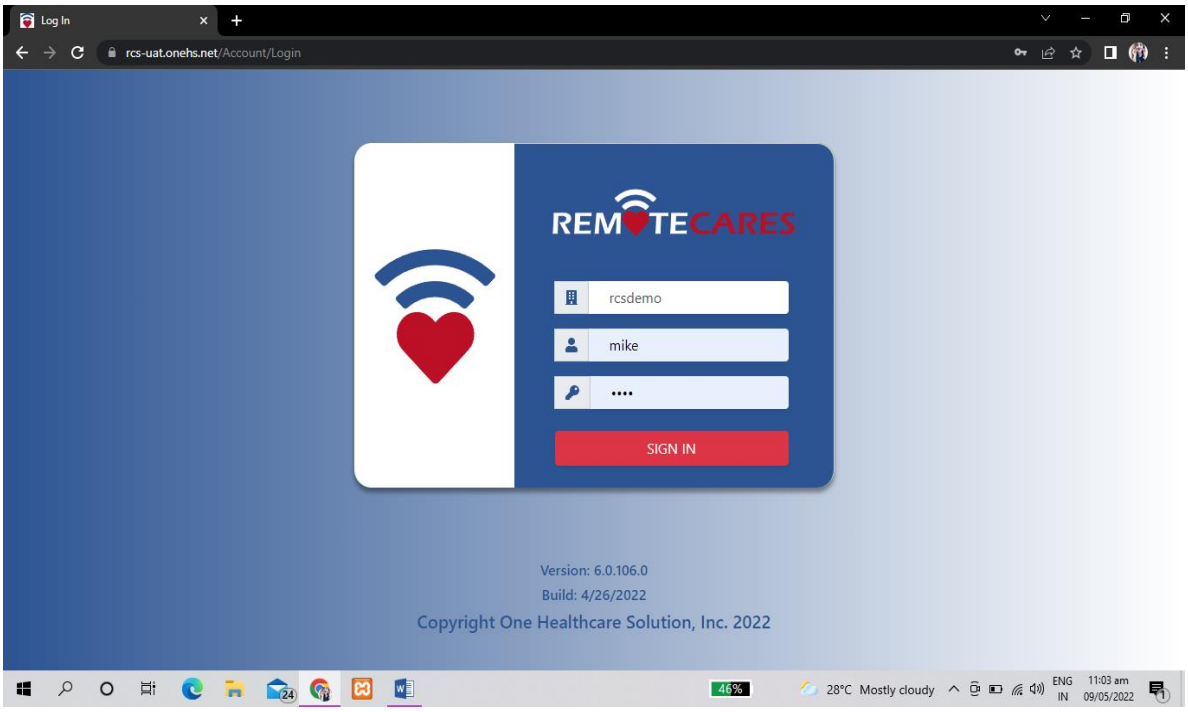
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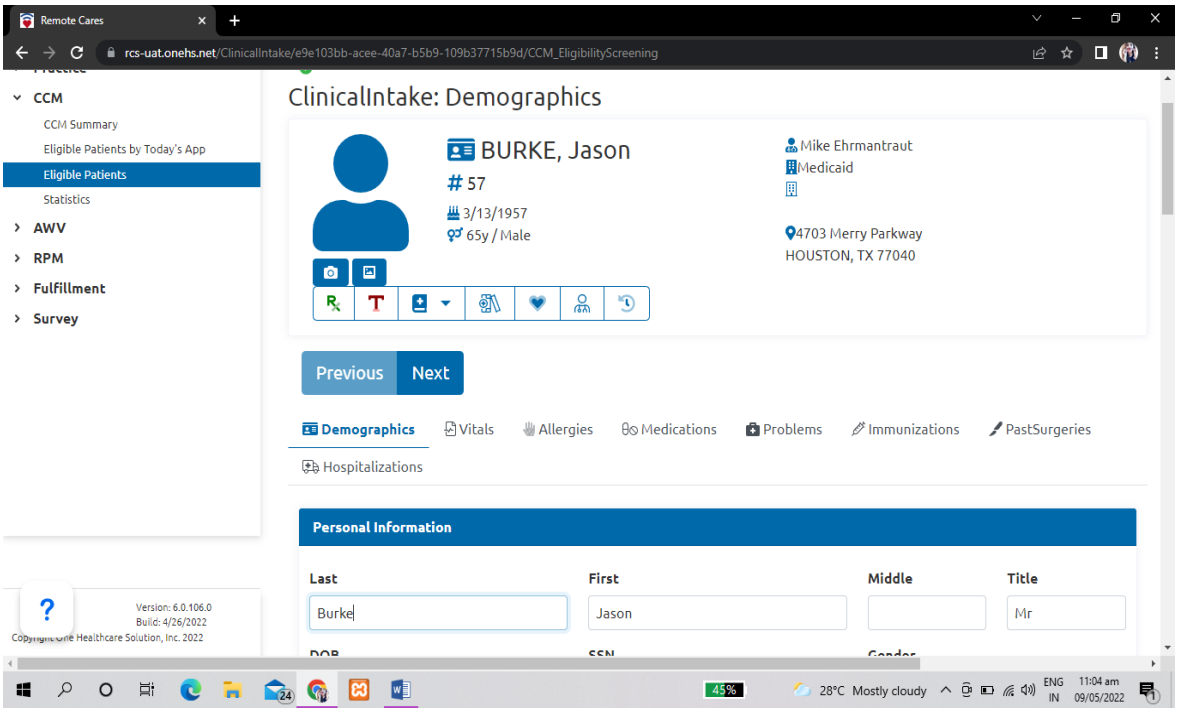
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65y / Male
Mike Ehrmantraut
Medicaid
4703 Merry Parkway
HOUSTON, TX 77040
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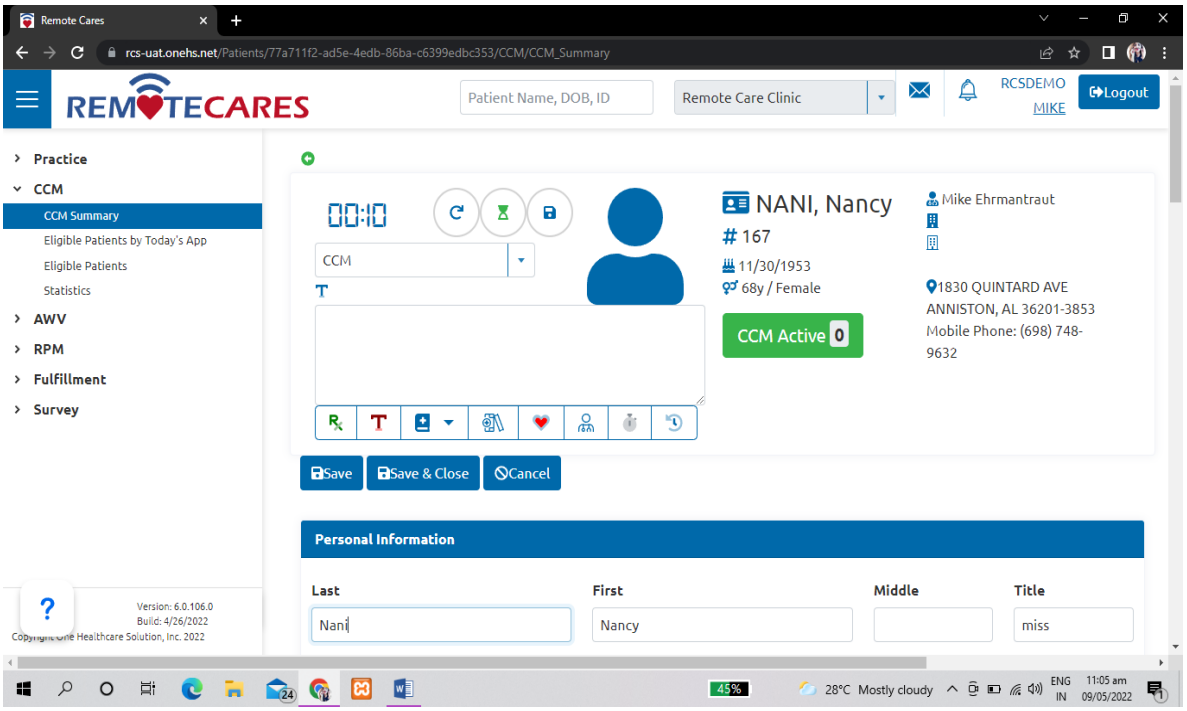
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Mike Ehrmantraut
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ANNISTON, AL 36201-3853
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Conclusion

Chronic care management has become a standard component of health coverage, as health plans regardless of size, location, and ownership status are including it in their products. Plans usually combine disease management for patients with common chronic conditions with case management for high-risk members, regardless of the underlying condition. The main aim of chronic care management is that plans see a win-win situation, because they believe that it allows them to both improve care for their most vulnerable members and reduce the cost of coverage. The clearest evidence for plans' trust in chronic care management is that they are including it in their fully insured products, indicating their conviction that they can offer more competitive products when including chronic care management. Another important observation is that plans are bringing chronic care management programs in-house and are integrating different components into the plans' operations. However, plans are finding it difficult to realize the full potential of chronic care management. Only a subset of members who could potentially benefit from it join a chronic care management program, because plans lack valid contact information and because members are reluctant to engage. At the same time, providers are sometimes ill-equipped to deliver the continuous care management services that are essential for high-quality chronic care, because of an episode-focused payment system and limited technological capabilities. In response, approaches to chronic care management are evolving toward increasing patient-centeredness, targeting of care needs, and coordination with providers. Improving providers' experiences with and uptake of CCM will require addressing several challenges, including the upfront investment for CCM set-up and the time required to provide CCM to more complex patients. The CCM addresses several of the six national quality aims advocated by the Institute of Medicine; that patient care should be safe, effective, patient-centered, timely, efficient, and equitable. Specifically, medication reconciliation addresses the aim for patient safety.

Future Enhancement

We currently has a list of enhancements planned for the future, varying from trivial to very complex. Some of these, in no particular order, are listed below.

- Eligible Patients can be identified by integrating API with Medicaid
- Ability for the Patient login. So that they can be more proactive in coordinating with care.
- Automated Work flow implementation
- Instead of calling the patient via telephone. We can implement tele-calling integrated in the system.
- Integrate billing with 3rd party solutions via HL7 Messages

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- Strategies to support self-management in chronic conditions: collaboration with clients [Internet]. Toronto: Registered Nurses' Association of Ontario; Sep, 2010. [cited 2015 Dec 8]. (Clinical Best Practice Guidelines).

DISEASE DIAGNOSIS SYSTEM

A project Submitted to

ST. MARY'S COLLEGE (AUTONOMOUS), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

in partial fullfilment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted By

AMIRTHA. J

Reg. No.: 20SPCS02

Under the Supervision and Guidance of

Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D.,

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi- 628001

MAY 2022

CERTIFICATE

This is to certify that this project work entitled as "**DISEASE DIAGNOSIS SYSTEM**" is submitted to St. Mary's College (Autonomous), Thooothukudi affiliated to **Manonmaniam Sundaranar University**, **Tirunelveli,** in partial fulfilment for the award of the degree of Master of Science in Computer Science for the work done during the year 2021-2022 by **AMIRTHA. J (Reg. No.: 20SPCS02).**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do hereby declare that the project entitled "**DISEASE DIAGNOSIS SYSTEM**" submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D.,** Assistant Professor, PG Department of Computer Science (SSC), St. Mary's College (Autonomous), Thoothukudi.

Station: Thoothukudi **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA.,M.Phil.,Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani, Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and Coordinator, PG Department of Computer Science (SSC) for her support and counsel.

I express my hearty thanks to my guide, Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC) for her valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to Ms. A. Jenitta Jebamalar M.Sc.(IT), M.Sc.(CS), M.Phil., B.Ed., Assistant Professor, PG Department of Computer Science (SSC) for her encouragement and support.

I am much indebted to Mr. Arunachalam, M.Sc Computer Science, Proprietor, Acme Infotek for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

ABSTRACT

A clinical decision support system forms a critical capability to link health observations with health knowledge to influence choices by clinicians for improved healthcare. Recent trends toward remote outsourcing can be exploited to provide efficient and accurate clinical decision support in healthcare. In this scenario, clinicians can use the health knowledge located in remote servers via the Internet to diagnose their patients. Data mining techniques have been applied magnificently in many fields including business, science, the Web, bioinformatics, and on different types of data such as textual, visual, spatial, real-time and sensor data. Medical data is still rich in information but poor in knowledge. There is a lack of effective analysis tools to discover the hidden relationships and trends in medical data obtained from clinical records. This paper reviews the state of the research in art on heart disease diagnosis and prediction. It presents an overview of the current research being carried out using the data mining techniques to enhance heart disease diagnosis and prediction using Support Vector Machine (SVM). Results show that this algorithm perform positively high to predict the presence of human diseases.

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1. INTRODUCTION

The advancement of information technology, system integration as well as software development, techniques have shaped a innovative generation of multifaceted computer systems. Information technology researchers have been offered several challenges by these systems. An instance of such system is the healthcare system. Newly, there has been an enlarged awareness to make use of the advancement of data mining technologies in healthcare systems. Consequently, the objective of the present effort is to explore the aspects of making use of health data for the assistance of humans by means of new machine learning and data mining techniques. The thought is to recommend an computerized method for diagnosing heart diseases based on prior data and information. Data mining is a discipline to realize knowledge from databases. The database contains a set of instances (records or case).

Machine learning can be defined as a scientific field so as to plan and develop algorithms that let computers to enhance acquaintance of real time problem based on earlier statistics, and perform to resolve a real time problem beneath definite instructions and rules. At hand there are numerous presentations of machine learning; data mining is the largely used application of machine learning. Every illustration used by machine learning and data mining algorithms is formatted by means of same set of fields (features, attributes, inputs, or variables). When the instances contain the correct output (class label) then the learning process is called the supervised learning. On the other hand, the process of machine learning without knowing the class label of instances is called unsupervised learning. Clustering is a common unsupervised learning method (some clustering models are for both). The objective of clustering is to describe data. On the other hand, classification and regression are predictive methods. In the present research, my focus is on supervised machine learning. This project propose new methods intended for investigating feature selection techniques as well as develop new machine learning algorithms designed for providing automatic computer aided analysis and decision support system for heart disease diagnosis. The aim is to build up an integrated structure with a righteous workflow (constructing missing features values, feature selections, and classification algorithms).

2. SYSTEM SPECIFICATION

HARDWARE REQUIREMENTS:

COMPONENT	**SPECIFICATION**
CPU	Intel Dual Core 2.4 GHz or Later
RAM	2GB DDR2
Hard Disk	160 GB
Display	Wide VGA (Video Graphics Array)
Input	Keyboard and Mouse
Optional Devices	Android Phone (Jelly Bean 4.2 or higher)

SOFTWARE REQUIREMENTS:

COMPONENT	**SPECIFICATION**
Front End	Android
Back End	MySQL
IDE	Android Studio
Language	Java
Platform	Windows 7 or later
Database Server	XAMPP

3. PROJECT DESCRIPTION

SCOPE OF THE PROJECT

The patient can without much of a stretch recognize the diseases. The patients can undoubtedly recognize the disease by simply ascribing their issues and the application interface produces what malady the user might be tainted with. The framework will demonstrate complaisant in critical situations where the patient can't achieve a doctor's facility or when there are situations, when professionals are accessible in the territory. Predictive analysis would be performed on the disease that would result in recommending drugs to the user by taking into account various features in the database. The experimental results can also be used in further research work and for healthcare tools.

AIM OF THE PROJECT

The main aim of the project is to apply data mining combines fact-based examination, machine learning, and database design to remove shrouded connections from vast databases. It uses two methodologies: Supervised learning and Unsupervised learning. In supervised, a training set is used to display parameters and in unsupervised learning no training set is utilized. In data mining each technique serves a different purpose depending on the objective of the modelling.

OBJECTIVE OF THE PROJECT

The main objective of this project is to develop an android application which uses some data mining algorithms, languages used will be python and java. The system takes the symptoms from the users which they are feeling at that moment and runs a data mining algorithm in the cloud to detect the disease from which the user may be suffering. The System collects raw data from the user or consumer. As the massive amount of information is already available from healthcare websites, patients can easily compare the diagnosis done by their doctors and the related information which is already present on the internet. Also, by accessing online support group chat system patients can communicate with other patients who are suffering from similar kinds of diseases, this way they can exchange information who might have suffered the same kind of symptoms. The system uses the provided data from the user and matches the symptoms already stored in the database. The database uses various data mining techniques and an intelligent algorithm.

4. MODULE DESCRIPITION

MODULES

1. Clinician
2. Diagnosis Generator
3. Symptoms Analyzer
4. Server-Client
5. Normalization

Clinician

In this module, an algorithm which utilizes the healthcare knowledge available in the remote location via the Internet while preserving privacy. Hence, we consider a client–server scenario where the remote server uses as a decision making tool. A clinician sends the patient data over the Internet and obtains support from the server to make a decision. However, the clinician is reluctant to reveal the patient data or the decision to the server due to privacy concerns. At the same time the server desires not to leak any parameter values of the classification function as this would be a breach of privacy of the training clinical data samples which relate to other patients.

Diagnosis Generator

In this module, the doctors can upload diseases symptoms and the generator tool automatically stored in the server. Before upload process, this tool will segment the symptoms and diseases and other details using delimited character space. The generator tool will create a key file that can be later used in symptom analyzer tool. This key file can be created by heart specialized doctor or any medical experts.

Symptom Analyzer

In this module, the users of the diagnosis tool can upload the key file generated from diagnosis generator tool. The symptoms and diagnosed diseases will segment the content and update the database. Also the symptom analyzer can compute the input from the patients and compare it to the symptoms database in the encrypted form and detect the disease name and treatments and forward it to clinician tool.

Network Connection

In this module each devices (clinician and symptom analyzer) will have unique IP address for communication. These tool uses network socket programming. Also the symptom analyzer can access from the Internet. The client–server model of computing is a distributed application structure that partitions tasks or workloads between the providers of a resource or service, called servers, and service requesters, called clients.

Normalization

In this module, the private key resides at the clinician side; hence, it is not possible for the remote server which participates in this classification operation to decrypt
the test sample or the classification result. However, the remote server interacts with the clinician, to get the private key for comparison. During the interaction any encrypted values sent by the server could be decrypted by the clinician. The encryption will be segmented and compared with database and send the appropriate result to clinician application.

5. SYSTEM STUDY

EXISTING SYSTEM

To enumerate dynamically the optimal subsets of the reduced features of high interest by using rough sets technique associated to dynamic programming. Therefore to validate the classification using Random Forest (RF) decision tree to identify the risky heart disease cases. This work is based on a large amount of data collected from several clinical institutions based on the medical profile of patient. Moreover, the experts' knowledge in this field has been taken into consideration in order to define the disease, its risk factors, and to establish significant knowledge relationships among the medical factors.

DISADVANTAGES OF EXISTING SYSTEM

- Observed to overfit for some datasets with noisy classification/regression tasks.
- Prediction inaccuracy
- Uses on high data set leads to low performance

PROPOSED SYSTEM

The main purpose of feature selection is to reduce the number of features used in classification while maintaining acceptable classification accuracy. For example, the Sequential Forward Floating Selection (SFFS) algorithm proposed by Pudil et al. was one of the commonly used algorithms. The main advantage of this method is that it produces a hierarchy of feature subsets with the best selection for each dimension. In our previous work, information gain is used to find the relevant features. Information gain is the difference between the original information content and the amount of information needed. The features are ranked by the information gains, and then the top ranked features are chosen as the potential attributes used in the classifier.

ADVANTAGES OF PROPOSED SYSTEM

- Finding significant patterns for heart attack prediction are presented in this project.
- Increases high performance in using large data sets.

6. SYSTEM ANALYSIS

FEASIBILITY STUDY

TECHNICAL FEASIBILITY:

In this study, we analyze the database contains a set of instances (records or case). Machine learning can be defined as a scientific field so as to plan and develop algorithms that let computers to enhance acquaintance of real time problem based on earlier statistics, and perform to resolve a real time problem beneath definite instructions and rules. At hand there are numerous presentations of machine learning; data mining is the largely used application of machine learning. Every illustration used by machine learning and data mining algorithms is formatted by means of same set of fields (features, attributes, inputs, or variables). When the instances contain the correct output (class label) then the learning process is called the supervised learning. On the other hand, the process of machine learning without knowing the class label of instances is called unsupervised learning. Clustering is a common unsupervised learning method (some clustering models are for both).

FUNCTIONAL FEASIBILITY

In this study we analyze the association rule mining and classification functionalities of data mining. Association rule mining is used to find associations or correlations among the item sets. It is a unsupervised learning where no class attribute is involved in finding the association rule. On the other hand, classification is a supervised learning where class attribute is involved in the construction of the classifier and is used to classify or predict the data unknown sample.

Associative classification is a recent and rewarding technique which integrates association rule mining and classification to a model for prediction and achieves maximum accuracy. Associative classifiers are especially fit to applications where maximum accuracy is desired to a model for prediction.

OPERATIONAL FEASIBILITY

In this study, we classify the all types of diseases affecting different components of the heart. Heart means 'cardio.' Therefore, all heart diseases belong to the category of cardiovascular diseases.

1. Coronary heart disease: It also known as coronary artery disease (CAD), it is the most common type of heart disease across the world. It is a condition in which plaque deposits block the coronary blood vessels leading to a reduced supply of blood and oxygen to the heart.

2. Angina pectoris: It is a medical term for chest pain that occurs due to insufficient supply of blood to the heart. Also known as angina, it is a warning signal for heart attack. The chest pain is at intervals ranging for few seconds or minutes.

3. Congestive heart failure: It is a condition where the heart cannot pump enough blood to the rest of the body. It is commonly known as heart failure.

4. Cardiomyopathy: It is the weakening of the heart muscle or a change in the structure of the muscle due to inadequate heart pumping. Some of the common causes of cardiomyopathy are hypertension, alcohol consumption, viral infections, and genetic defects.

5. Congenital heart disease: It also known as congenital heart defect, it refers to the formation of an abnormal heart due to a defect in the structure of the heart or its functioning. It is also a type of congenital disease that children are born with.

6. Arrhythmias: It is associated with a disorder in the rhythmic movement of the heartbeat. The heartbeat can be slow, fast, or irregular. These abnormal heartbeats are caused by a short circuit in the heart's electrical system.

7. SYSTEM DESIGN

ARCHITECTURAL DIAGRAM:

Design is the first step in the development phase for any techniques and principles for the purpose of defining a device, a process or system in sufficient detail to permit its physical realization. Once the software requirements have been analyzed and specified the software design involves three technical activities design, coding, implementation and testing that are required to build and verify the software.

The design activities are of main importance in this phase, because in this activity, decisions ultimately affecting the success of the software implementation and its ease of maintenance are made. These decisions have the final bearing upon reliability and maintainability of the system. Design is the only way to accurately translate the customer's requirements into finished software or a system. Design is the place where quality is fostered in development. Software design is a process through which requirements are translated into a representation of software. Software design is conducted in two steps. Preliminary design is concerned with the transformation of requirements into data.

UML DIAGRAMS

Actor

A coherent set of roles that users of use cases play when interacting with the use cases.

Use case

A description of sequence of actions, including variants, that a system performs that yields an observable result of value of an actor.

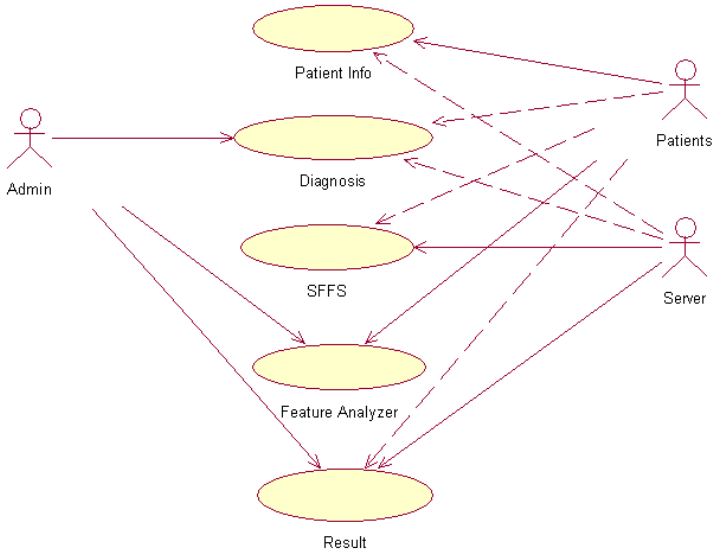
UML stands for Unified Modelling Language. UML is a language for specifying, visualizing and documenting the system. This is the step while developing any product after analysis. The goal from this is to produce a model of the entities involved in the project which later need to be built. The representation of the entities that are to be used in the product being developed need to be designed. There are various kinds of methods in software design. They are as follows:

- Use case Diagram
- Sequence Diagram
- Collaboration Diagram
- Activity Diagram
- State chat Diagram

USECASE DIAGRAMS

Use case diagrams model behaviour within a system and helps the developers understand of what the user require. The stick man represents what's called an actor. Use case diagram can be useful for getting an overall view of the system and clarifying that can do and more importantly what they can't do. Use case diagram consists of use cases and actors and shows the interaction between the use case and actors.

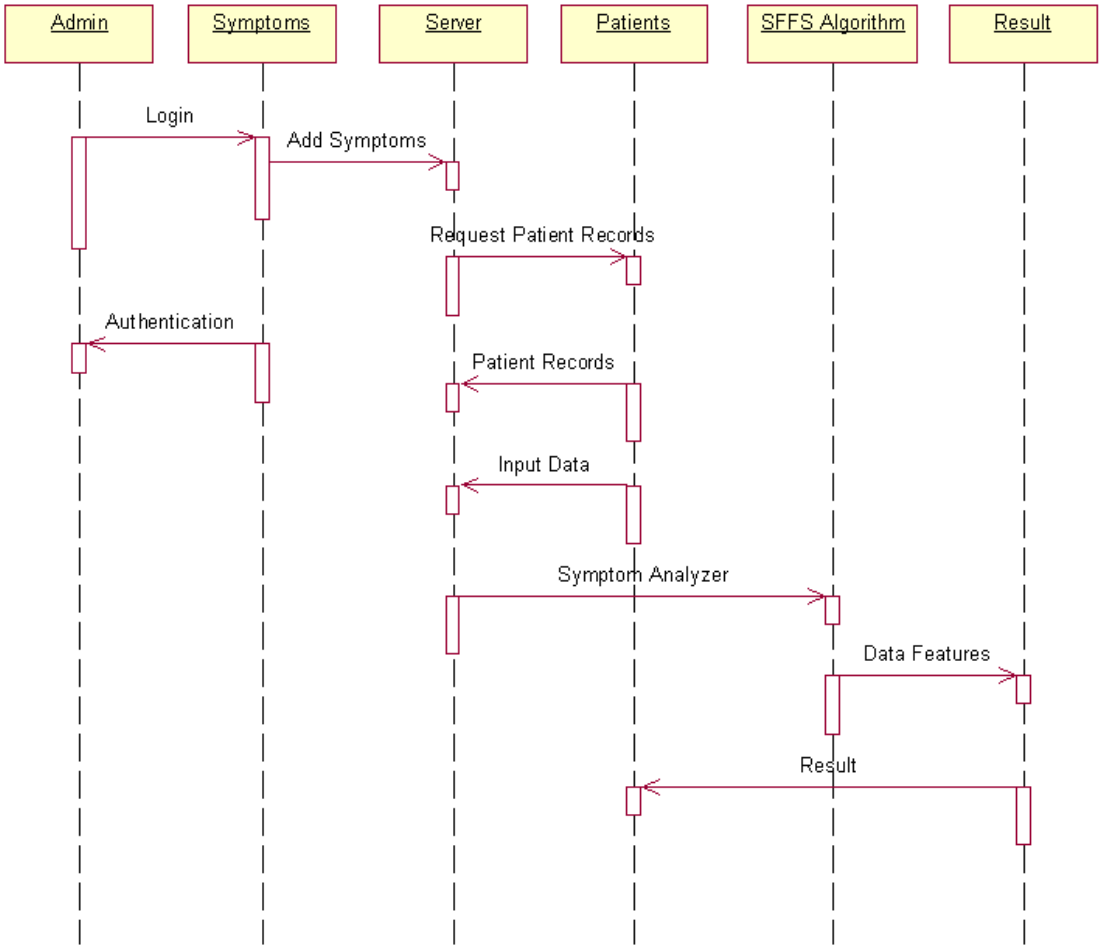
- The purpose is to show the interactions between the use case and actor.
- To represent the system requirements from user's perspective.
- An actor could be the end-user of the system or an external system



SEQUENCE DIAGRAM

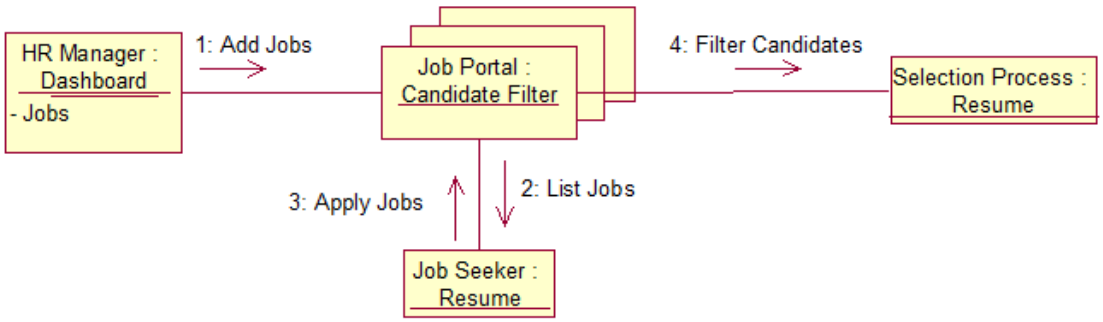
Sequence diagram and collaboration diagram are called INTERACTION DIAGRAMS. An interaction diagram shows an interaction, consisting of set of objects and their relationship including the messages that may be dispatched among them.

A sequence diagram is an introduction that empathizes the time ordering of messages. Graphically a sequence diagram is a table that shows objects arranged along the X-axis and messages ordered in increasing time along the Y-axis.



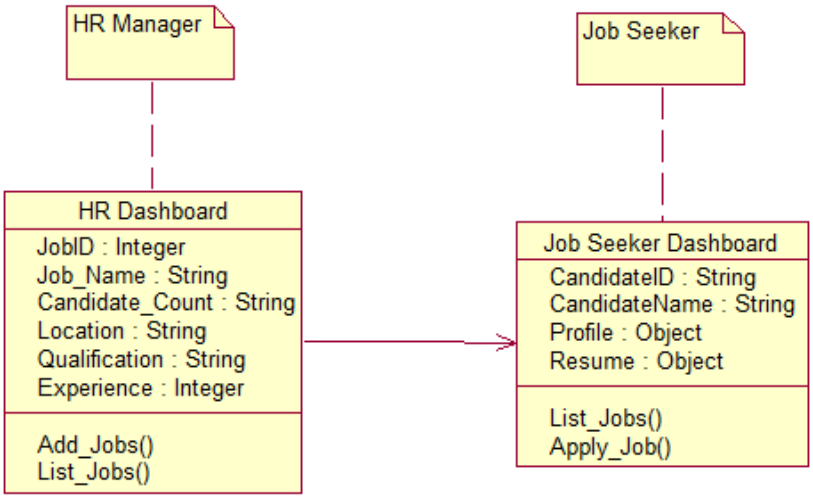
COLLABORATION DIAGRAM

A collaboration diagram is an introduction diagram that emphasizes the structural organization of the objects that send and receive messages. Graphically a collaboration diagram is a collection of vertices and arcs.



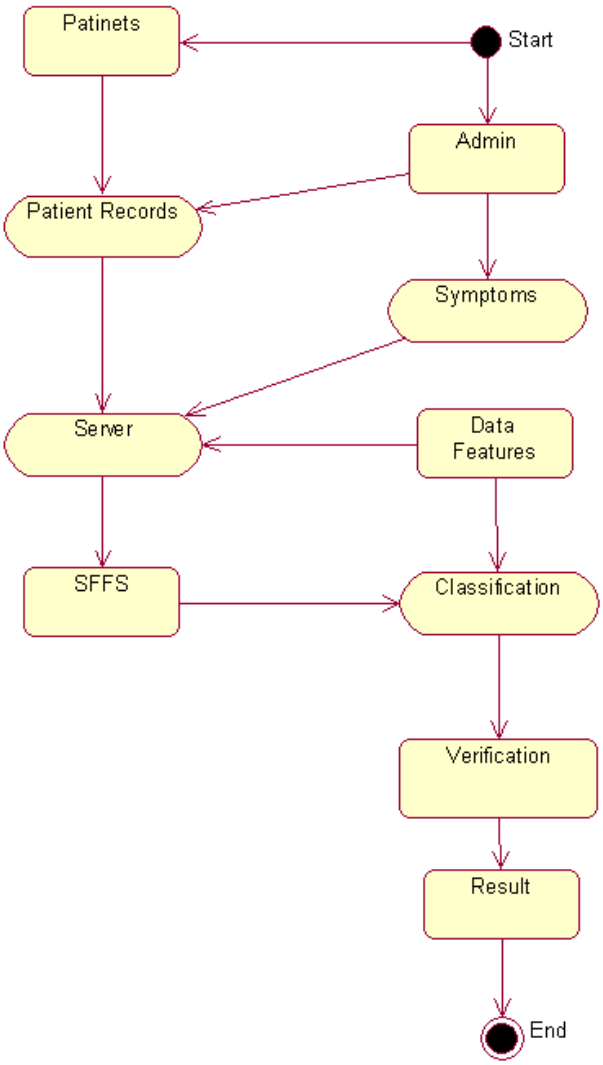
CLASS DIAGRAM

Class is nothing but a structure that contains both variables and methods. The Class Diagram shows a set of classes, interfaces, and collaborations and their relating ships. There is most common diagram and are used to give the static view of a system. It shows the dependency between the classes that can be used in our system. The interactions between the modules or classes of our projects are shown below. Each block contains Class Name, Variables and Methods. Class is a set of objects that share the same operations, attributes relationship and semantics.

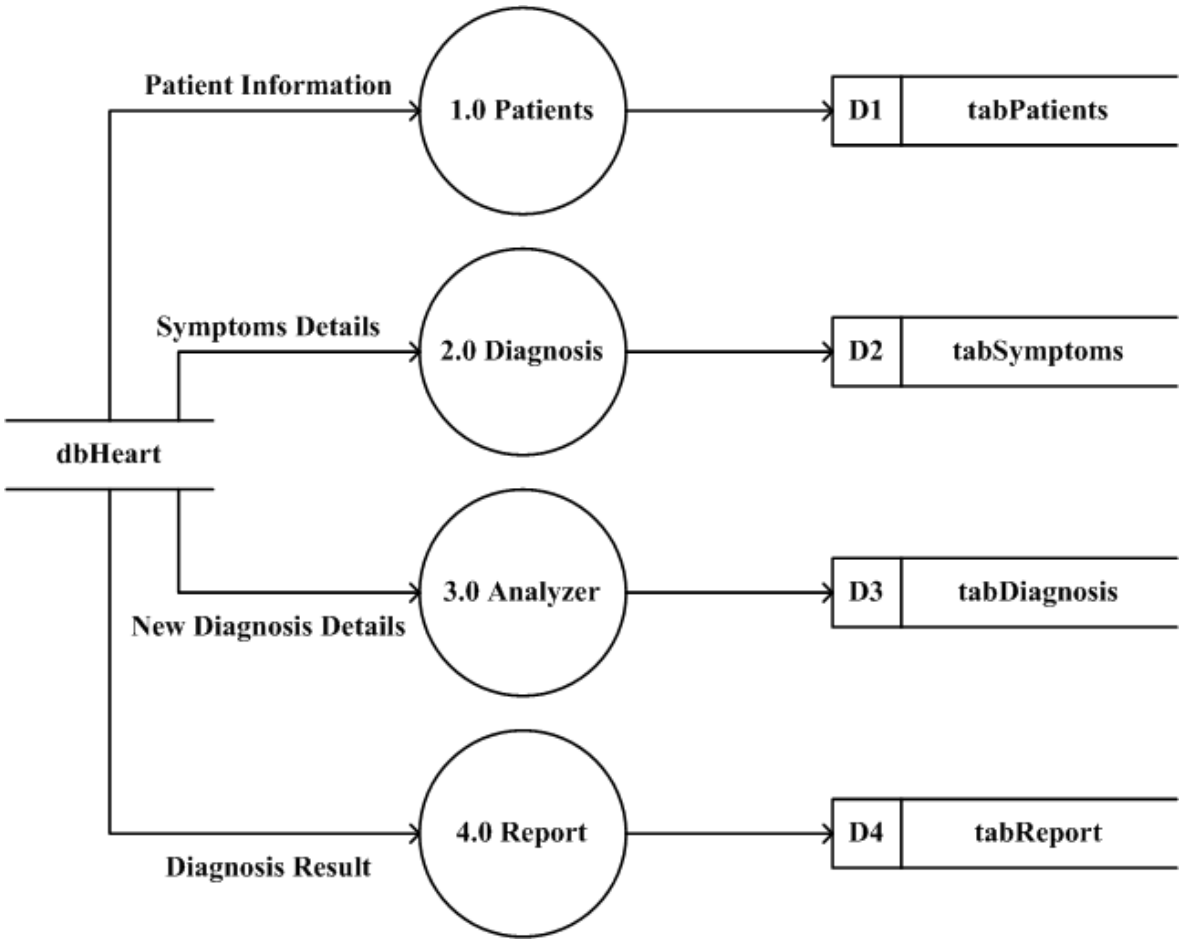


ACTIVITY DIAGRAM

Activity diagram is defined as a UML diagram that focuses on the execution and flow of the behaviour of a system instead of implementation. It is also called object-oriented flowchart. Activity diagrams consist of activities that are made up of actions which apply to behavioural modelling technology.


Patinets
Start
Admin
Patient Records
Symptoms
Server
Data
Features
SFFS
Classification
Verification
Result
End

DATA FLOW DIAGRAM



8. SYSTEM TESTING

GENERAL

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub-assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement. Testing is a process of executing a program with the intent of finding an error. Testing is a crucial element of software quality assurance and presents ultimate review of specification, design and coding. System Testing is an important phase. Testing represents an interesting anomaly for the software. Thus a series of testing are performed for the proposed system before the system is ready for user acceptance testing. A good test case is one that has a high probability of finding an as undiscovered error. A successful test is one that uncovers an as undiscovered error

DEVELOPING METHODOLOGIES

The test process is initiated by developing a comprehensive plan to test the general functionality and special features on a variety of platform combinations. Strict quality control procedures are used. The process verifies that the application meets the requirements specified in the system requirements document and is bug free. The following are the considerations used to develop the framework from developing the testing methodologies.

Testing Objectives

1. Testing is a process of executing a program with the intent of finding an error
2. A good test case is one that has a probability of finding an as yet undiscovered error
3. A successful test is one that uncovers an undiscovered error

The primary objective for test case design is to derive a set of tests that has the highest livelihood for uncovering defects in software. To accomplish this objective two different categories of test case design techniques are used.

WHITE-BOX TESTING

White-box testing focus on the program control structure. Test cases are derived to ensure that all statements in the program have been executed at least once during testing and that all logical conditions have been executed.

BLOCK-BOX TESTING

Black box testing is designed to validate functional requirements without regard to the internal workings of a program. Black box testing mainly focuses on the information domain of the software, deriving test cases by partitioning input and output in a manner that provides through test coverage. Incorrect and missing functions, interface errors, errors in data structures, error in functional logic are the errors falling in this category.

UNIT TESTING

Unit testing is essential for the verification of the code produced during the coding phase and hence the goal is to test the internal logic of the modules. Using the detailed design description as a guide, important paths are tested to uncover errors within the boundary of the modules. These tests were carried out during the programming stage itself. All units of Vienna SQL were successfully tested.

INTEGRATION TESTING

Integration testing focuses on unit tested modules and build the program structure that is dictated by the design phase.

SYSTEM TESTING

System testing tests the integration of each module in the system. It also tests to find discrepancies between the system and its original objective, current specification and system documentation. The primary concern is the compatibility of individual modules. Entire system is working properly or not will be tested here, and specified path ODBC connection will correct or not, and giving output or not are tested here these verifications and validations are done by giving input values to the system and by comparing with expected output. Top-down testing are implementing here.

9. CODING

DOCTOR APP

MAIN ACTIVITY:

```
package com.example.doctorapp;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
public class MainActivity extends AppCompatActivity {
SharedPreferences sharedPreferences;
Button btnAddDisease, btnListDiseases, btnTreatments, btnFoodPlan, btnHospitals, btnSettings;
TextView tvDoctorName;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
sharedPreferences = (SharedPreferences) getSharedPreferences("doctorapp",
MODE_PRIVATE);
String DoctorName = sharedPreferences.getString("doctorname", "Doctor");
tvDoctorName = (TextView) findViewById(R.id.tvDoctorName);
tvDoctorName.setText("Welcome Dr. " + DoctorName);
btnAddDisease = (Button) findViewById(R.id.btnAddDisease);
btnAddDisease.setOnClickListener(new View.OnClickListener() {
```

```
@Override
public void onClick(View view) {
Intent intent = new Intent(MainActivity.this, AddDiseaseActivity.class);
startActivity(intent);
}
});
btnListDiseases = (Button) findViewById(R.id.btnListDiseases);
btnListDiseases.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
Intent intent = new Intent(MainActivity.this, ListDiseasesActivity.class);
startActivity(intent);
}
});
btnTreatments = (Button) findViewById(R.id.btnTreatments);
btnTreatments.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
Intent intent = new Intent(MainActivity.this, TreatmentsActivity.class);
startActivity(intent);
}
});
btnFoodPlan = (Button) findViewById(R.id.btnFoodPlan);
btnFoodPlan.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
Intent intent = new Intent(MainActivity.this, FoodPlanActivity.class);
startActivity(intent);
}
});
btnHospitals = (Button) findViewById(R.id.btnHospitals);
```

```
btnHospitals.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
Intent intent = new Intent(MainActivity.this, ListTreatmentsActivity.class);
startActivity(intent);
}
});
btnSettings = (Button) findViewById(R.id.btnSettings);
btnSettings.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
Intent intent = new Intent(MainActivity.this, SettingsActivity.class);
startActivity(intent);
}
});
}
@Override
public boolean onCreateOptionsMenu(Menu menu) {
getMenuInflater().inflate(R.menu.menu_main, menu);
return super.onCreateOptionsMenu(menu);
}
@Override
public boolean onOptionsItemSelected(@NonNull MenuItem item) {
if (item.getItemId() == R.id.mnuLogout)
{
SharedPreferences.Editor editor = sharedPreferences.edit();
editor.remove("islogged");
editor.remove("loginid");
editor.remove("doctorname");
editor.commit();
Intent intent = new Intent(MainActivity.this, LoginActivity.class);
```

```
startActivity(intent);
finish();
}
return super.onOptionsItemSelected(item);
}
}
```

REGISTER ACTIVITY:

```
package com.example.doctorapp;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Spinner;
import android.widget.Toast;

public class RegisterActivity extends AppCompatActivity {

    EditText etDoctorName, etPractitionerNumber, etLoginID, etPassword, etConfirmPassword;
    Spinner spGender, spSpeciality;
    Button btnRegister;
    DBHelper dbHelper;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_register);

        dbHelper = new DBHelper(this);
```

```
        etDoctorName = (EditText) findViewById(R.id.etDoctorName);
        etPractitionerNumber = (EditText) findViewById(R.id.etPractitionerNumber);
        etLoginID = (EditText) findViewById(R.id.etLoginID);
        etPassword = (EditText) findViewById(R.id.etPassword);
        etConfirmPassword = (EditText) findViewById(R.id.etConfirmPassword);

        spGender = (Spinner) findViewById(R.id.spGender);
        spSpeciality = (Spinner) findViewById(R.id.spSpeciality);

        btnRegister = (Button) findViewById(R.id.btnRegister);
        btnRegister.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String DoctorName = etDoctorName.getText().toString();
                String Gender = spGender.getSelectedItem().toString();
                String Speciality = spSpeciality.getSelectedItem().toString();
                String PractitionerNumber = etPractitionerNumber.getText().toString();
                String LoginID = etLoginID.getText().toString();
                String Password = etPassword.getText().toString();
                String ConfirmPassword = etConfirmPassword.getText().toString();

                if (DoctorName.length() > 0 && PractitionerNumber.length() > 0 &&
LoginID.length() > 0 && Password.length() > 0 && ConfirmPassword.length() > 0)
                {
                    if (Password.equals(ConfirmPassword))
                    {
                        String query = "select * from tabdoctors where loginid='" + LoginID + "'";
                        String result = dbHelper.checkRecord(query);

                        if (result.equals("false"))
                        {
```

```
                    query = "insert into tabdoctors values('" + DoctorName + "','" + Gender  + "','" + Speciality  + "','" + PractitionerNumber  + "','" + LoginID  + "','" + Password + "')";
                    result = dbHelper.execNonQuery(query);
                    if (result.equals("true"))
                    {
                        Toast.makeText(RegisterActivity.this, "Registration Success: Doctor Details registered successfully!", Toast.LENGTH_SHORT).show();
                        finish();
                    }
                }
                else
                {
                    Toast.makeText(RegisterActivity.this, "Registration Failed: Login ID already used.", Toast.LENGTH_SHORT).show();
                }
            }
            else
            {
                Toast.makeText(RegisterActivity.this, "Registration Failed: Password and Confirm Password does not match.", Toast.LENGTH_SHORT).show();
            }
        }
        else
        {
            Toast.makeText(RegisterActivity.this, "Registration Failed: Enter all mandatory fields", Toast.LENGTH_SHORT).show();
        }
    }
});
}
}
```

PATIENT APP

SEARCH ACTIVITY:

```
package com.example.patientapp;

import androidx.annotation.RequiresApi;
import androidx.appcompat.app.AppCompatActivity;

import android.app.ProgressDialog;
import android.content.Intent;
import android.os.AsyncTask;
import android.os.Build;
import android.os.Bundle;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.ImageButton;
import android.widget.ListAdapter;
import android.widget.ListView;
import android.widget.Spinner;
import android.widget.Toast;

import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;

import java.util.ArrayList;
import java.util.HashMap;
import java.util.List;

public class SearchActivity extends AppCompatActivity {
```

```
    Spinner spSymptoms;
    ImageButton btnAddSymptom;
    Button btnProceed;
    ListView lvSymptoms;

    List<String> spinnerArray;

    DBHelper dbHelper;
    private ProgressDialog pDialog;
    private String jsonString;
    List<String> listItems;
    String str_Symptoms;

    ArrayAdapter<String> adapter;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_search);

        dbHelper = new DBHelper(this);
        listItems = new ArrayList<String>();

        str_Symptoms = "";

        adapter = new ArrayAdapter<String>(getApplicationContext(),
android.R.layout.simple_list_item_1, listItems);

        spSymptoms = (Spinner) findViewById(R.id.spSymptoms);
        btnAddSymptom = (ImageButton) findViewById(R.id.btnAddSymptom);
        btnAddSymptom.setOnClickListener(new View.OnClickListener() {
```

```
        @RequiresApi(api = Build.VERSION_CODES.N)
        @Override
        public void onClick(View view) {
            String Symptom = spSymptoms.getSelectedItem().toString();
            if (Symptom.length() > 0) {
                if (!str_Symptoms.contains(Symptom))
                {
                    listItems.add(Symptom);
                    adapter.notifyDataSetChanged();
                    lvSymptoms.setAdapter(adapter);
                    str_Symptoms += "'" + Symptom + "',";
                }

            }
            else {
                Toast.makeText(SearchActivity.this, "Symptom cannot be empty.",
Toast.LENGTH_SHORT).show();
            }
        }
    });


    lvSymptoms = (ListView) findViewById(R.id.lvSymptoms);

    btnProceed = (Button) findViewById(R.id.btnProceed);
    btnProceed.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            if (str_Symptoms.length() > 0) {
                str_Symptoms = str_Symptoms.substring(0, str_Symptoms.length() - 1);
                Intent intent = new Intent(SearchActivity.this, DiseasesActivity.class);
```

```
                intent.putExtra("symptoms", str_Symptoms);
                startActivity(intent);
            }
            else
            {
                Toast.makeText(SearchActivity.this, "Add Symptoms to process.",
Toast.LENGTH_SHORT).show();
            }
        }
    });

    LoadItems();
  }

  void LoadItems()
  {
    try {
      String Query = "select * from tabsymptoms";
      String output = dbHelper.LoadJSON(Query, "symptoms");
      if (!output.equals("false")) {
        jsonString = output;
        new getItemList().execute();
      }
      else
      {
        Toast.makeText(this, "Records not found!", Toast.LENGTH_SHORT).show();
        finish();
      }
    }
    catch (Exception ex) {
```

```
    }
}
private class getItemList extends AsyncTask<Void, Void, Void> {

    @Override
    protected void onPreExecute() {
        super.onPreExecute();
        // Showing progress dialog
        pDialog = new ProgressDialog(SearchActivity.this);
        pDialog.setMessage("Please wait...");
        pDialog.setCancelable(false);
        pDialog.show();
    }

    @Override
    protected Void doInBackground(Void... arg0) {
        try {
            if (jsonString != null) {
                JSONObject jsonObj = new JSONObject(jsonString);
                JSONArray jsonArray = jsonObj.getJSONArray("symptoms");

                spinnerArray =  new ArrayList<String>();
                for (int i = 0; i < jsonArray.length(); i++)
                {
                    JSONObject c = jsonArray.getJSONObject(i);
                    String Symptom = c.getString("symptom");

                    HashMap<String, String> item = new HashMap<>();
                    item.put("symptom", Symptom);

                    //listItems.add(item);
```

```
                spinnerArray.add(Symptom);

            }

        } else {
            runOnUiThread(new Runnable() {
                @Override
                public void run() {
                    Toast.makeText(getApplicationContext(), "Server Connection Error", Toast.LENGTH_SHORT).show();
                }
            });

        }
    } catch (final JSONException e) {
        runOnUiThread(new Runnable() {
            @Override
            public void run() {
                Toast.makeText(getApplicationContext(),"Json parsing error: " + e.getMessage(), Toast.LENGTH_LONG).show();
            }
        });

    }

    return null;
}

@RequiresApi(api = Build.VERSION_CODES.N)
@Override
protected void onPostExecute(Void result) {
```

```
            super.onPostExecute(result);
            if (pDialog.isShowing())
                pDialog.dismiss();


            ArrayAdapter<String> adapter = new ArrayAdapter<String>(SearchActivity.this,
android.R.layout.simple_spinner_item, spinnerArray);
            adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
            spSymptoms.setAdapter(adapter);
        }
    }
}
```

MapsActivity:

```
package com.example.patientapp;

import androidx.fragment.app.FragmentActivity;

import android.content.Intent;
import android.os.Bundle;

import com.google.android.gms.maps.CameraUpdateFactory;
import com.google.android.gms.maps.GoogleMap;
import com.google.android.gms.maps.OnMapReadyCallback;
import com.google.android.gms.maps.SupportMapFragment;
import com.google.android.gms.maps.model.LatLng;
import com.google.android.gms.maps.model.MarkerOptions;
import com.example.patientapp.databinding.ActivityMapsBinding;

public class MapsActivity extends FragmentActivity implements OnMapReadyCallback {

    private GoogleMap mMap;
    private ActivityMapsBinding binding;
    double hospital_lat, hospital_lng;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

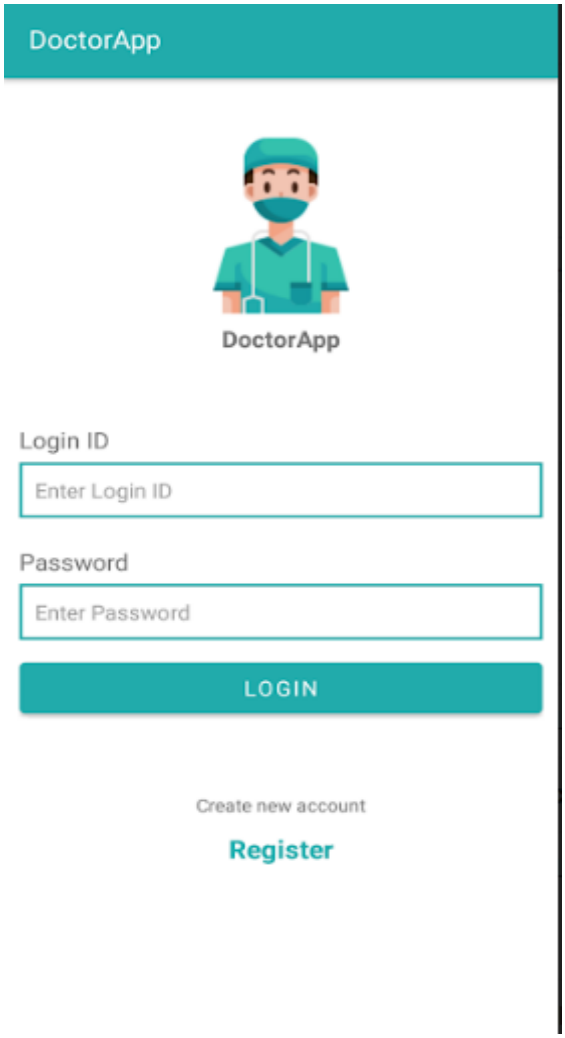
        binding = ActivityMapsBinding.inflate(getLayoutInflater());
        setContentView(binding.getRoot());

        // Obtain the SupportMapFragment and get notified when the map is ready to be used.
```

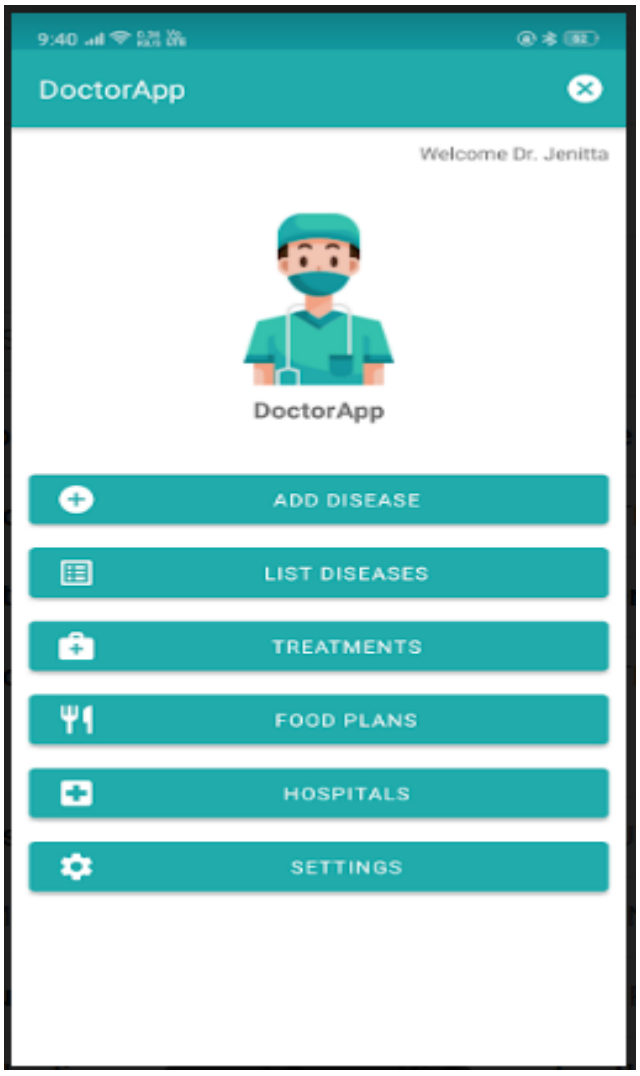
```
        SupportMapFragment mapFragment = (SupportMapFragment) getSupportFragmentManager()
                .findFragmentById(R.id.map);
        mapFragment.getMapAsync(this);
        Intent thisIntent = getIntent();
        hospital_lat = thisIntent.getDoubleExtra("lat", 0.0);
        hospital_lng = thisIntent.getDoubleExtra("lng", 0.0);
    }
    /**
     * Manipulates the map once available.
     * This callback is triggered when the map is ready to be used.
     * This is where we can add markers or lines, add listeners or move the camera. In this case,
     * we just add a marker near Sydney, Australia.
     * If Google Play services is not installed on the device, the user will be prompted to install
     * it inside the SupportMapFragment. This method will only be triggered once the user has
     * installed Google Play services and returned to the app.
     */
    @Override
    public void onMapReady(GoogleMap googleMap) {
        mMap = googleMap;
        // Add a marker in Sydney and move the camera
        LatLng sydney = new LatLng(hospital_lat, hospital_lng);
        mMap.addMarker(new MarkerOptions().position(sydney).title("Hospital Location"));
        mMap.moveCamera(CameraUpdateFactory.newLatLng(sydney));
    }
}
```

10. SCREENSHOTS

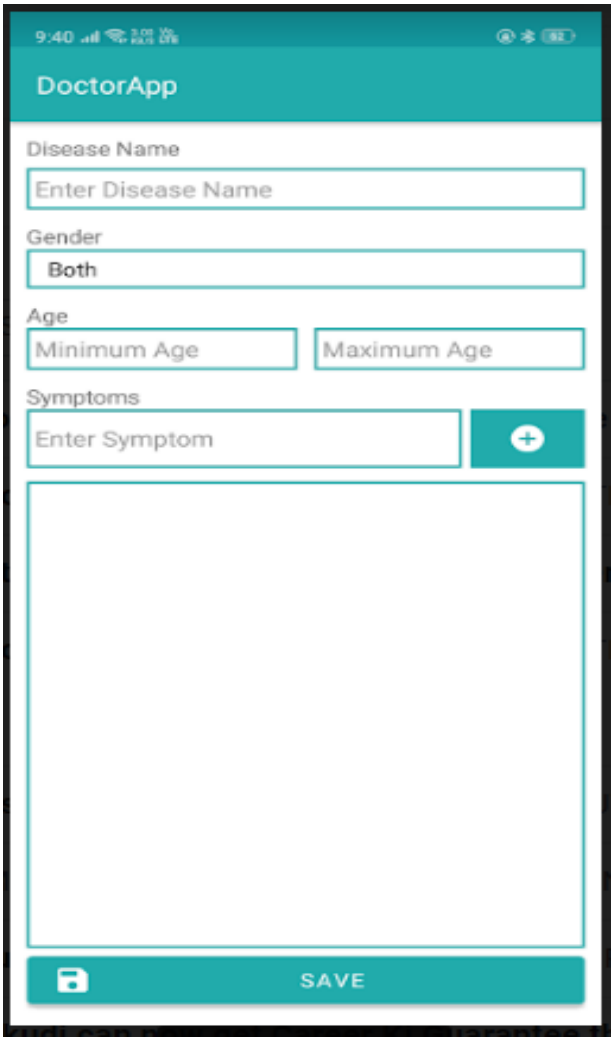
COLLEGE APP
LOGING PAGE:



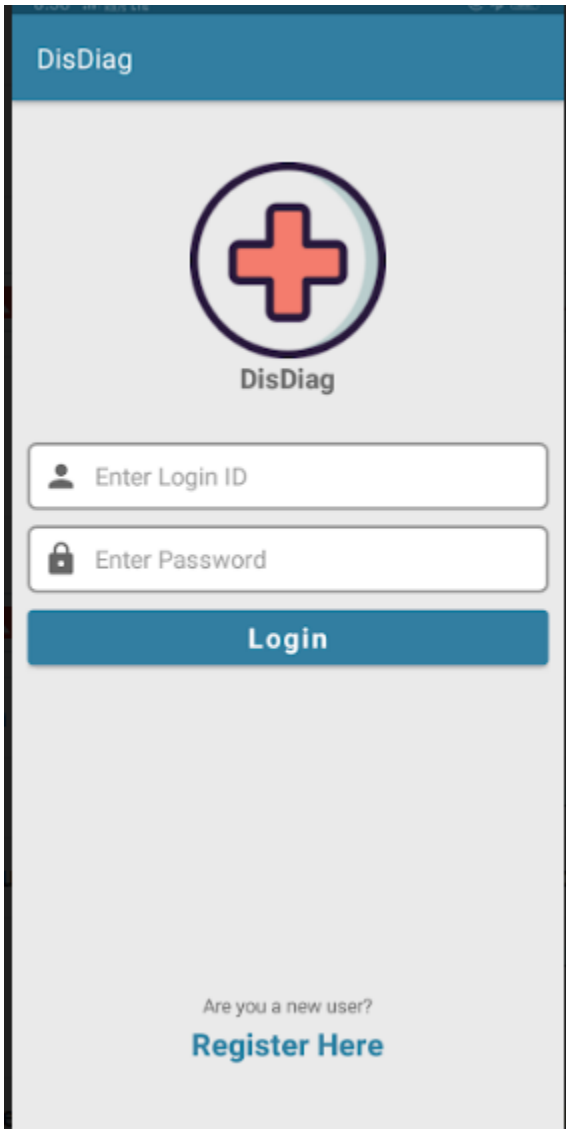
FRONT PAGE:


9:40
DoctorApp
Welcome Dr. Jenitta
DoctorApp
ADD DISEASE
LIST DISEASES
TREATMENTS
FOOD PLANS
HOSPITALS
SETTINGS

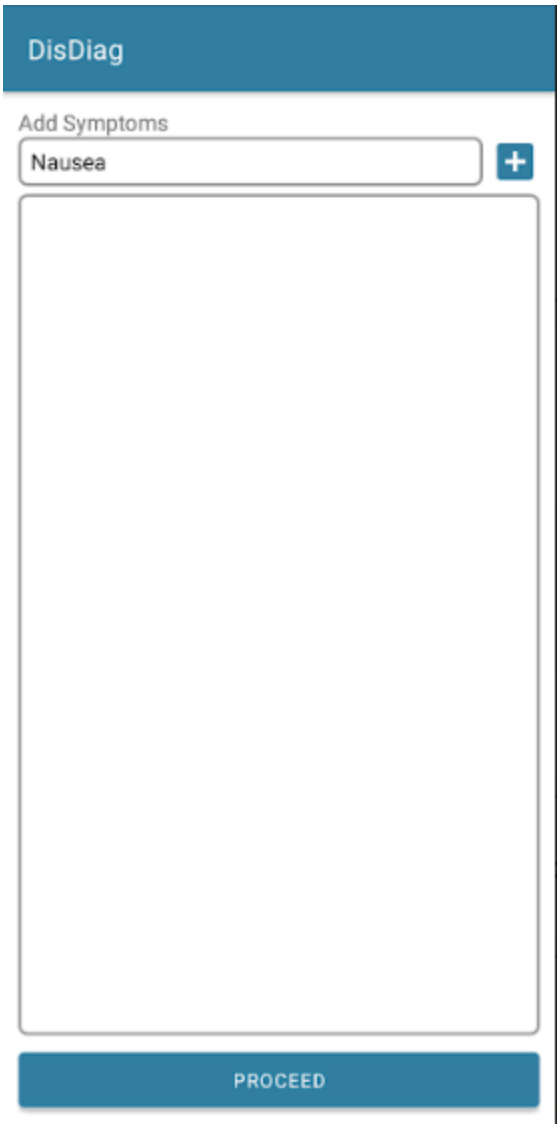
SYMPTOMS ADDING PGE:



PATIENT APP
LOGIN PAGE:



SYMPTOMS ADDING PAGE:



11. CONCLUSION

In this proposed project, SFFS algorithms that measure the influence that modifications of data values have on discovered statistical importance of patterns are being developed, although it would be impossible to develop a universal measure for all data mining algorithms. Even if data mining results are credible, convincing the health practitioners to change their habits based on evidence may be a bigger problem. Data mining in healthcare can be limited in data access, since the raw inputs for data mining frequently exist in different settings and systems, like administrations, clinics, laboratories etc. Therefore, data must be collected and integrated before data mining can take place.

12. FUTURE ENHANCEMENT

The future work will involve the amalgamation of the various specified algorithms to augment the accuracy so that the diagnosis can develop into more accurate in case of imperceptibly identified data sets. The research work mainly focused on knowing the major motive for commencement and indulging the youth in drugs. Ongoing efforts are geared towards increasing the size of data set. The research work is of great help for analyzing various factors for booming situation of drugs. The system is of great relevance to the user in detection of the various factors related to drug addiction which will help in providing the correct medication about him/her and will help in saving his precious human live.

BIBLIOGRAPHY

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- Android App Development For Dummies by Michael Burton
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- Android Application Development All-in-One For Dummies by Barry A. Burd and John Mueller
- Head First PHP & MySQL by Lynn Beighley and Michael Morrison

Website Referred

https://www.tutorialspoint.com/android/index.htm

https://www.javatpoint.com/android-tutorial

https://www.geeksforgeeks.org/android-tutorial/

https://stackoverflow.com/

https://www.w3schools.com/

FOOD WASTE MANAGEMENT

A project Submitted to

ST. MARY'S COLLEGE (AUTONOMOUS), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

in partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted By

ANNIE APSARA .K

Reg No.: 20[redacted]PCS03

Under the Supervision and Guidance of

Ms. A. Jenitta Jebamalar M.Sc., (IT)., M.Sc.,(CS), M.Phil., B.Ed.,

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi- 628001

May 2022

CERTIFICATE

This is to certify that this project work entitled as "**FOOD WASTE MANAGEMENT**" is submitted to St. Mary's College (Autonomous), Thooothukudi affiliated to Manonmaniam Sundaranar University, Tirunelveli, in partial fulfillment for the award of the degree of Master of Science in Computer Science for the work done during the year 2021-2022 by **ANNIE APSARA.K (REG NO.: 20SPCS03)**

Signature of the Guide

Signature of the Co-ordinator

Signature of the Director

Director
Self Supporting Courses
St. Mary's College (Autonomous)
Thoothukudi - 628 001.

Signature of the Principal

Principal
St. Mary's College (Autonomous)
Thoothukudi - 628 001.

Signature of the Examiner

DECLARATION

I do hereby declare that the project entitled "**FOOD WASTE MANAGEMENT**" submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Ms. A. Jenitta Jebamalar M.Sc., (IT)., M.Sc.,(CS), M.Phil., B.Ed.,** Assistant Professor, PG Department of Computer Science (SSC), St. Mary's College (Autonomous), Thoothukudi.

K. Annie Apsara.

Station: Thoothukudi

Signature of the Student

Date: 23.05.2022

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA.,M.Phil.,Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani, Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and Coordinator, PG Department of Computer Science (SSC) for her support and counsel.

I express my hearty thanks to my guide, Ms.A. Jenitta Jebamalar M.Sc.(IT), M.Sc.(CS), M.Phil., B.Ed., Assistant Professor, PG Department of Computer Science (SSC) for her valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC) for her encouragement and support.

I am much indebted to Mr.N. Arunachalam., M.sc(CS)., Proprietor., Acme Infotek., for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

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Website : www.acmeinfotek.com

Date: 14-05-2022

To

The Head of the Department
PG Department of Computer Science (SSC)
St. Mary's College (Autonomous)
Thoothukudi

Dear Sir/Madam,

Sub: Project Completion Certificate-Reg

On behalf of **Acme Infotek**, we are pleasure to inform you that **Mrs. K. Annie Apsara, Reg No: 20SPCS03** studying **M.Sc., Computer Science** Final year has been done the project work at our concern on "**Food Waste Management**" during the period from February 2022 to May 2022.

During this period, we noticed her to be diligent, sincere and hardworking and she accomplished her task within stipulated deadline. We wish her for all future endeavours.

ACME INFOTEK Tirunelveli

PROJECT DIRECTOR

ABSTRACT

ABSTRACT

In highly populated countries like India, food wastage is a disturbing issue. The streets, garbage bins and landfills have ample proof to prove it. Marriages, canteens, restaurants, social and family get-togethers and functions expel out so much food. Food wastage is not only an indication of hunger or pollution, but also of many economic problems. The high standard of living has resulted in the wastage of food because of quick changes in habits and lifestyle. Instead of wasting these things we can put them in use by donating them to various organizations such as orphanages, old age homes, etc. The product is an internet-based android application that basically aims at charity through donations. The sharp increase in the amount of wastage in terms of food makes the need for charity in terms of donation. This paper presents 'Helping Hands', a new internet-based application that provides a platform for donating old stuff and leftover food to all needy people/organizations. It provides information about the motivation to come up with such an application, thereby describing the existing donation system and how the proposed product works for the betterment of society.

The product is shown to be an effective means of donating things to organizations, etc., over the internet. It shows the potential for avoiding the wastage of food. The objectives of project is to study the current practices related to the various waste management initiatives taken in India for human wellbeing. The other purpose is to provide some suggestions and recommendations to improve the waste management practices in Indian towns. This project is based on secondary research. It offers deep knowledge about the various waste management initiatives in India and find out the scope for improvement in the management of waste for the welfare of the society. The paper attempts to understand the important role played by the formal sector engaged in waste management in our country. This work is original and could be further extended.

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INTRODUCTION

INTRODUCTION

Food Waste Definition According to the Waste Framework Directive by the EU law , waste is 'any substance or object which the holder discards or intends or is required to discard'. However, there is not a consensus about the exact meaning of the term "food waste". The Food and Agriculture Organisation of the United Nations distinguishes between the so-called "wastage" produced mainly in the beginning of the supply chain (during production, post-harvest and processing stages), called food loss, and the wastage generated principally at the end of the supply chain once the food has been processed, known as food waste. The disadvantages of this definition are the difficulty to measure and report these parameters separately; in addition the concepts "food loss" and "food waste" can cover different stages of the supply chain for different food products or geographical areas (e.g. biscuits produced in a factory or directly in the point of sale). By contrast, the project funded by the European Commission Framework Programme 7 named Food Use for Social Innovation by Optimising Waste Prevention Strategies (FUSIONS) and the UK Waste & Resources Action Programme (WRAP) refer to both of these concepts as food waste.Another major discrepancy is the consideration of the inedible parts of food as food waste. FAO only count the parts of the food that could have been eaten by people. FUSIONS and WRAP also include inedible parts of food (such as bones or egg shells) in the definition of food waste. The quantification and treatment of separate edible and inedible parts of the food is normally difficult, and commonly unfeasible (a wasted orange will normally consist of the inedible peel and the edible orange itself and will not be peeled for its treatment).

The hotel waste can be wet waste or dry waste. The wet waste comprises of vegetable, waste from non-vegan food and waste water. The papers, plastic wrappers and bags are placed under the dry waste of hotel industries. The major factors contributing to the food waste generation are urbanization, lifestyle pattern, excessive food production, improper handling and storage.

This method can be implemented only if the wastes generated are combustible. They are incinerated in pits and covered with soil after burning. Burning may be used to reduce the volume of the waste and may be appropriate when there is limited space for land filling or burial. The major constraint is the smoke or fire hazards produced on incineration of wastes.

SYSTEM SPECIFICATION

SYSTEM SPECIFICATION

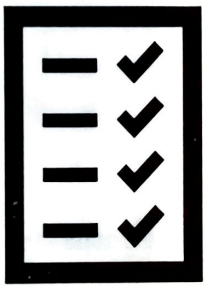
HARDWARE REQUIREMENTS

COMPONENT	SPECIFICATION
CPU	Intel Dual Core 2.4 GHz or Later
RAM	2GB DDR2
Hard Disk	160 GB
Display	Wide VGA (Video Graphics Array)
Input	Keyboard and Mouse
Optional Devices	Android Phone (Jelly Bean 4.2 or higher)

SOFTWARE REQUIREMENTS

COMPONENT	SPECIFICATION
Front End	Android
Back End	MySQL
IDE	Android Studio
Language	Java
Platform	Windows 7 or later
Database Server	XAMPP

PROJECT DESCRIPTION



PROJECT DESCRIPTION

The Project entitled Food Waste Management has following modules:

- Restaurant
- Admin
- Users
- Food Delivery

RESTAURANT

In this module, the restaurant can register their address and profile to the application. Each restaurant will provided with unique ID for login. The system uses one time login. The login process will enable the restaurant managers to add the excess food in the premises.

ADMIN

In this admin module, The admin can verify the authenticity of each users and restaurants. The food will be later send to users (orphanage or old-age homes) using delivery persons. The address/GPS will be used for pickup and delivery.

USERS

In this User module, any orphanage or old age homes can register themselves and avail the food to the premises. The information regarding during registration were Premises name, Category, Persons available.

DELIVERY

In this module, delivery guy with an android application will get update from the admin for from and where the foods have to be picked up and to and address of the user for delivery.

SYSTEM STUDY

SYSTEM STUDY

EXISTING SYSTEM

This paper provides a new automated measuring and accounting system, which helps discover trends in food wastage by correlating the food wastage with various other parameters like number of people generating that food, day of week and time of day. The another part of this paper is an LED display that presents the gross food waste that has been generated, associated cost of the food being dumped and an online portal wherein people can get more detailed information using easy to understand graphs and charts.

DISADVANTAGES OF EXISTING SYSTEM

1. Joint collection of all waste in one standard container (without lid) in municipalities and cities of India where separate waste collection is not yet widely used.
2. Incomplete coverage of waste sources by the waste collection system, which leads to unauthorized waste disposal in the environment (out of 711 MSW disposal facilities in the Perm region, 697 facilities were not authorized).
3. A high degree of deterioration of the container fleet and non-compliance of the placement and arrangement of container sites with the requirements of regulatory legislation.
4. Small garbage trucks for the collection and transportation of waste in most settlements, the efficiency of which decreases sharply when transporting waste over a distance of more than 5–10 km.

PROPOSED SYSTEM

The Proposed application Food donation portal is internet-based application that provides a platform for donating leftover food to all needy people/organizations. The product is shown to be an effective means of donating things to organizations, etc. over the internet. In highly populated countries like India, food wastage is a disturbing issue. Marriages, canteens, restaurants, social and family get togathers and functions expel out so much food. Instead of wasting these things

the system can put them in use by donating them to various organizations such as orphanages, old age homes, etc.

ADVANTAGES OF PROPOSED SYSTEM

1. Save food wastage in hostel.
2. Within less time attendance can perform.

METHODOLOGY

Step 1: Input the processes along with their burst time (bt). Sort all the processes in increasing order according to burst time. That is the number of different claims that are available for the excess food that is been updated with the distance and time to receive the excess food that is available.

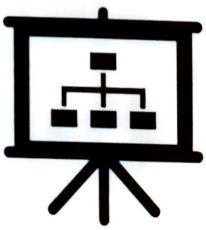
Step 2: Find waiting time (wt) for all processes. As first process that comes need not to wait so waiting time for process 1 will be 0 i.e. wt [0] = 0. Depending upon the time of availability that is the waiting time, the user gets constrained whether the excess food could be provided to the user.

Step 3: Find waiting time for all other processes i.e. for process I, wt[i] = bt[i-1] + wt[i-1].After finding out the distance based time provided to each user, the user with lesser waiting time is prioritized

Step 4:Find turnaround time for all other processes: Turnaround time = waiting time + burst time for all processes.

Step 5: Find average waiting time = Total waiting time / no of processes. Similarly, find average turnaround time= Total turnaround time / no of processes.

SYSTEM ANALYSIS



SYSTEM ANALYSIS

FEASIBILITY STUDY

All project is feasible when given unlimited resources and infinite time.it is both necessary and prudent to evaluate the feasibility of a project at the earliest possible time. A feasibility study is not warranted for system in which economic justification is obvious, technical risk is low, few legal problems are expected and no reasonable alternative exits an estimate is made of whether the identified user needs may be satisfied using current software and hardware technologies.

TECHNICAL FEASIBILITY

This is related to the technical of the project feasibility if check the cost to conduct a full system investigation, cost of hardware and software. The food waste management supports the economic feasibility to a great extends, development of the system and the cost of hardware and software are not high.

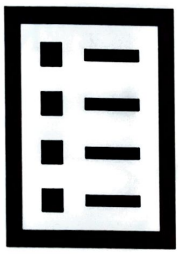
ECONOMIC FEASIBILITY

A system that can be develop d technically and that well be used, if installed, must be still good. Always the financial benefits must be equal or exceed the cost. Economic analysis is the most frequently used method for evaluating the effectiveness of a candidate system or more commonly known as cost or benefits analysis.

OPERATIONAL FEASIBILITY

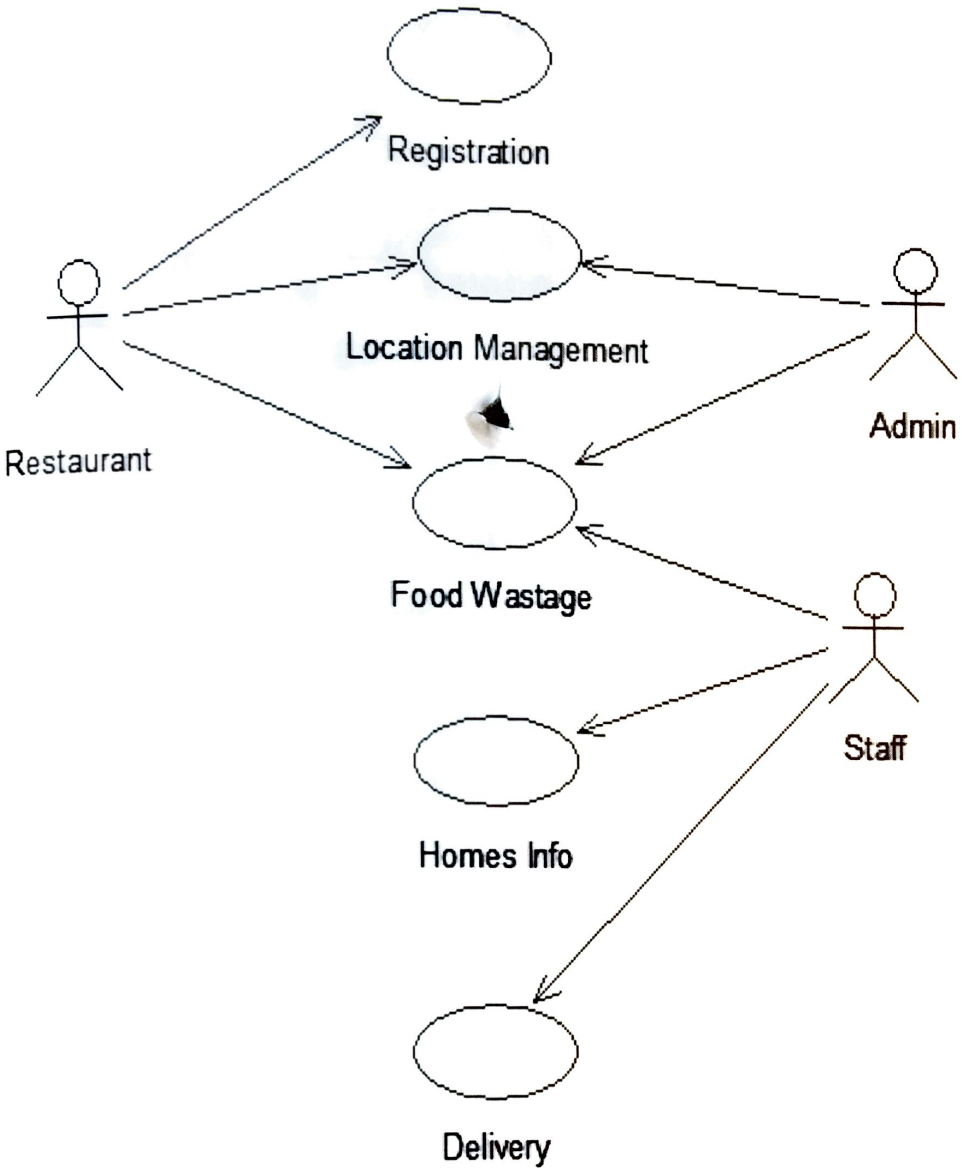
Proposed system is beneficial only if they can be turned into information systems. That is, it will meet the organization operating requirements and also check that whether the system will work when it is developed and installed. Therefore, it is understandable that the introduction of a candidate system requires special efforts to educate, sell and train others.

SYSTEM DESIGN

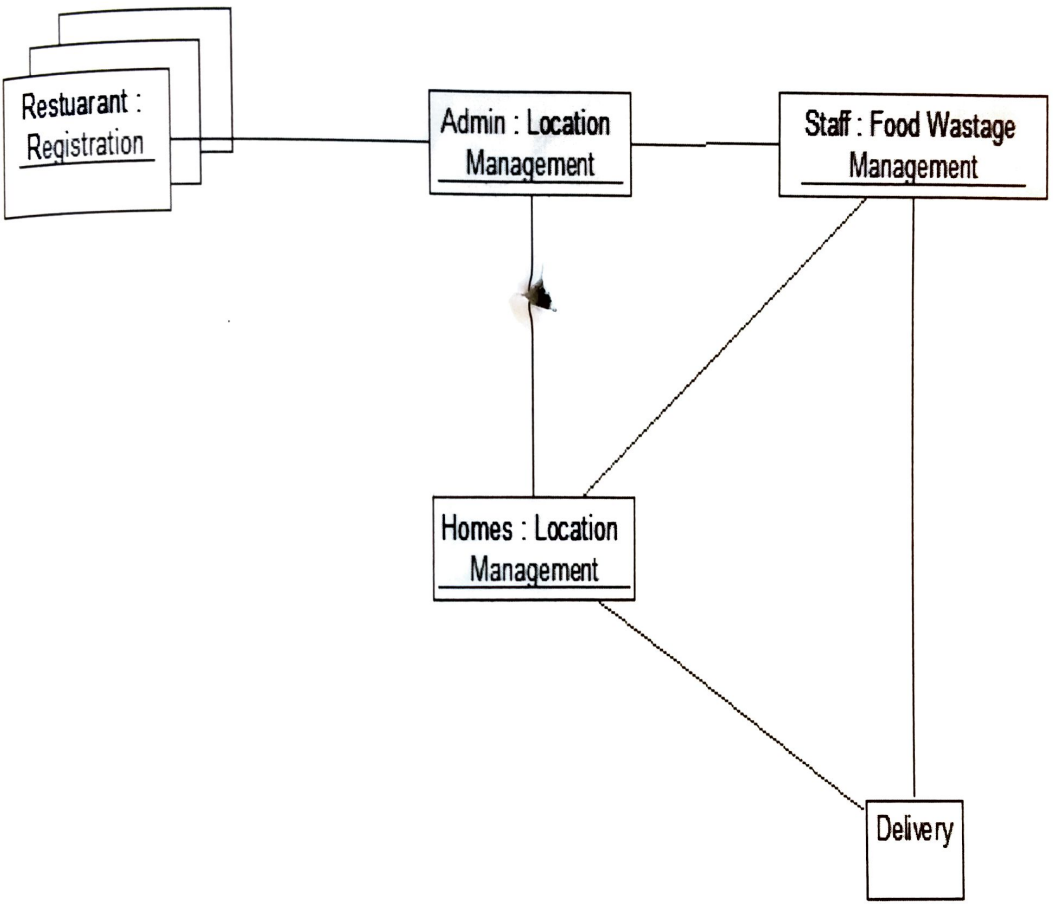


SYSTEM DESIGN

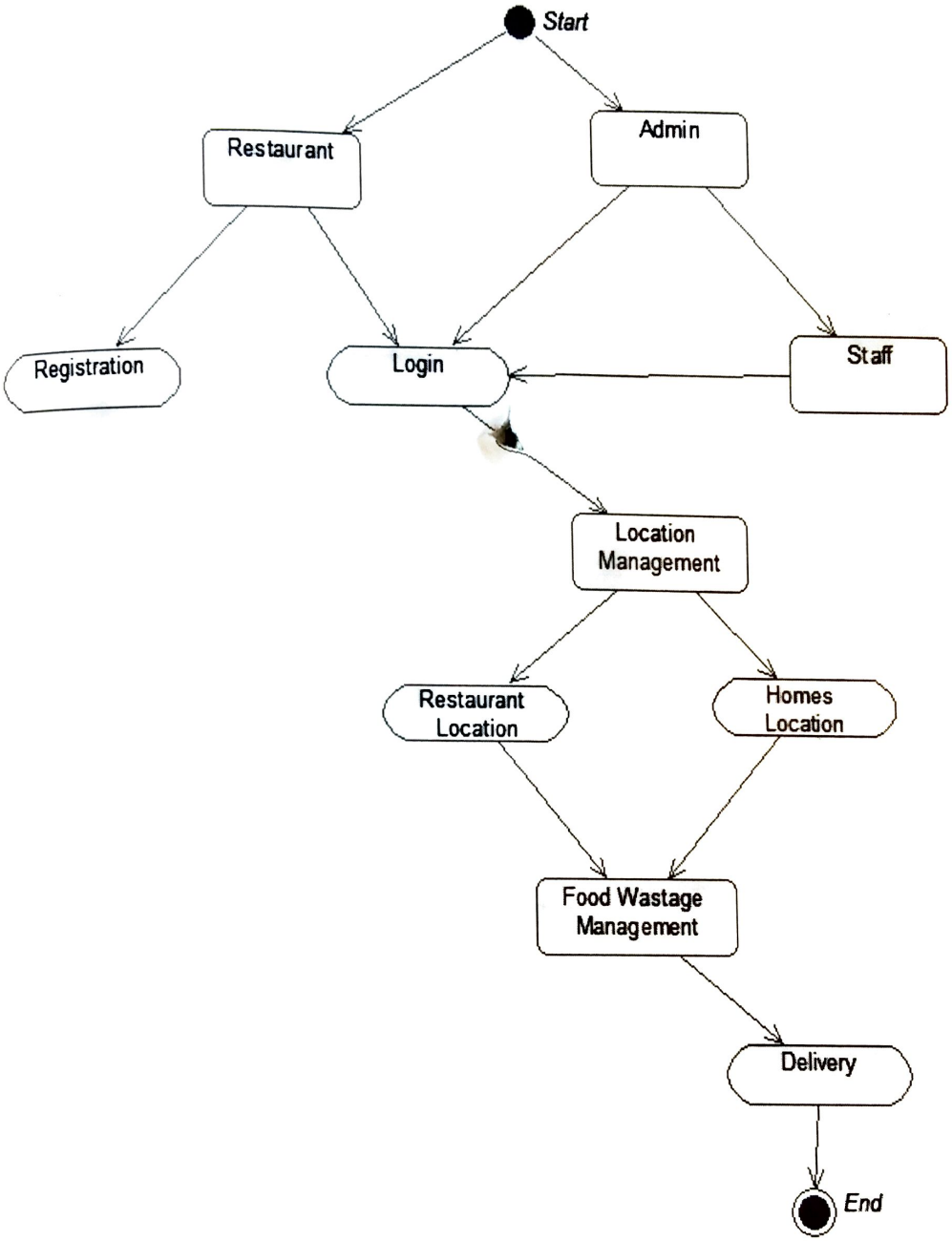
USE CASE



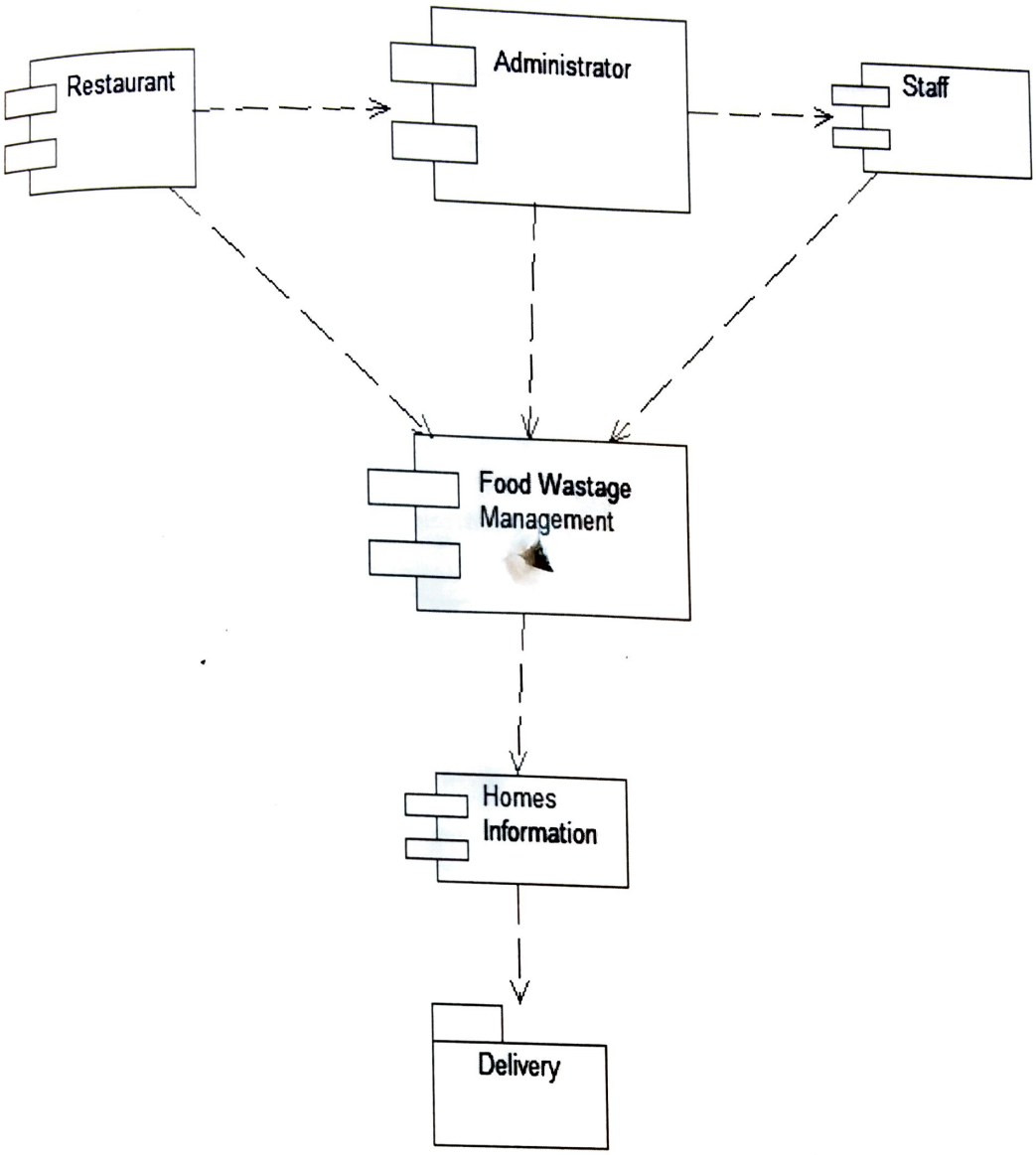
COLLOBRATION DIAGRAM



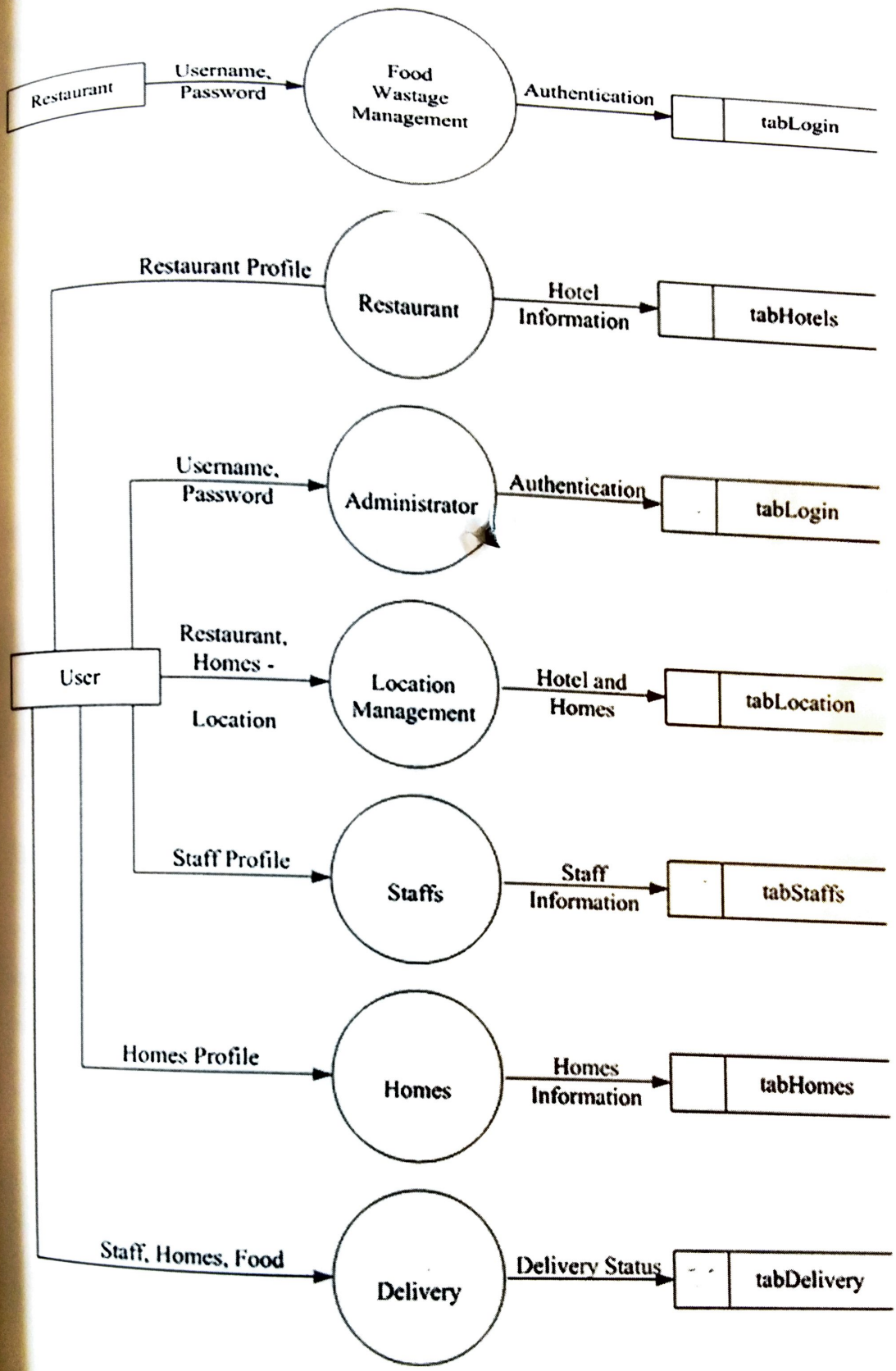
ACTIVITY DIAGRAM



COMPONENT DIAGRAM



DATA FLOW DIAGRAM



SYSTEM TESTING

SYSTEM TESTING

Before applying method to design effective test cases, a software engineer must understand the basic principles that guide software testing. Davis (DAV95) suggests a set of testing principles which have been adapted for use in this book.

- All tests should be traceable to customer requirements.
- Test should be planned long before testing begins.
- Test pare to principle applets to software testing.
- Testing should begin "in the small" and progress towards testing "in the page"
- Exhaustive testing is not possible.

Unit Testing

Unit testing focuses on verification errors on the smallest unit of software design-the module. Using the procedural design description as a guide, important control paths are tested to uncover errors within the boundary of the module.

The module interface is tested to ensure that the information properly flows into and out of the program unit under test. Boundary conditions are tested to ensure that the module operates properly at the boundaries established to limit of restrict processing.

White box Testing

White box testing is some time is called glass box testing, is a test case design that uses a control structure of the procedural design to drive the test cases. Using white-box testing methods, the software engineer can drive test cases that

- Guarantee that logical decisions are on the true and false sides
- Exercise all logical decisions are on the true and false sides
- Execute all loops at their boundaries and within their operational bounds
- Exercise internal data structure to assure the validity

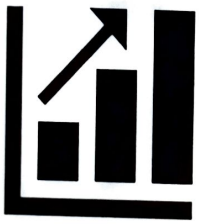
Black Box Testing

Black box testing focuses on the functional requirements of the software. That is black box testing enables the software engineer to drive a set of input conditions that will fully exercise the requirements for a program. Black box testing is not an alternative for white box testing techniques. Rather, it is a complementary approach that is likely to uncover different class of errors. Black box testing attempts to find errors in the following categories:

- Interface errors.
- Performances in data structures or external database access.
- Performance errors.
- Initialization and termination errors.
- Incorrect or missing functions.

All the above-mentioned errors were checked in the process of black.

CODING



CODING

FOOD ADMIN

Login page

```
package com.example.foodadmin;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;

import android.content.SharedPreferences;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.Toast;

public class LoginActivity extends AppCompatActivity {

EditText etLoginID, etPassword;

Button btnLogin;

SharedPreferences sharedPreferences;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity_login);

sharedPreferences = (SharedPreferences) getSharedPreferences("foodadmin",
MODE_PRIVATE);

etLoginID = (EditText) findViewById(R.id.etLoginID);

etPassword = (EditText) findViewById(R.id.etPassword);

btnLogin = (Button) findViewById(R.id.btnLogin);
```

```
btnLogin.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
String LoginID = etLoginID.getText().toString();
String Password = etPassword.getText().toString();
if(LoginID.equals("admin") && Password.equals("admin"))
{
Intent intent = new Intent(LoginActivity.this, MainActivity.class);
startActivity(intent);
finish();
}
else
{
Toast.makeText(LoginActivity.this, "Login Failed: Invalid Login ID or Password.",
Toast.LENGTH_SHORT).show();
}
}
});
}
}
```

RESTAURANT APP

Login page

```
package com.example.restaurantapp;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
```

```
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
public class LoginActivity extends AppCompatActivity {
SharedPreferences sharedPreferences;
DBHelper dbHelper;
EditText etLoginID, etPassword;
Button btnLogin;
TextView tvRegister;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_login);
sharedPreferences = (SharedPreferences) getSharedPreferences("restaurantapp",
MODE_PRIVATE);
String isLogged = sharedPreferences.getString("islogged", "no");
if (isLogged.equals("yes"))
{
Intent intent = new Intent(LoginActivity.this, MainActivity.class);
startActivity(intent);
finish();
```

```
}
dbHelper = new DBHelper(this);
etLoginID = (EditText) findViewById(R.id.etLoginID);
etPassword = (EditText) findViewById(R.id.etPassword);
btnLogin = (Button) findViewById(R.id.btnLogin);
btnLogin.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
String LoginID = etLoginID.getText().toString();
String Password = etPassword.getText().toString();
if (LoginID.length() > 0 && Password.length() > 0) {
String Query = "select * from tabhotels where loginid='" + LoginID + "' and password='" +
Password + "'";
String Result = dbHelper.CheckRecord(Query);
if (Result.equals("true")) {
SharedPreferences.Editor editor = sharedPreferences.edit();
editor.putString("islogged", "yes");
String HotelName = dbHelper.LoadRecord("select hotelname from tabhotels where loginid='" +
LoginID + "'");
editor.putString("loginid", LoginID);
editor.putString("hotelname", HotelName);
editor.commit();
Intent intent = new Intent(LoginActivity.this, MainActivity.class);
startActivity(intent);
finish();
} else if (Result.equals("false")) {
```

```
Toast.makeText(LoginActivity.this, "Login Failed: Invalid Login ID or Password.",
Toast.LENGTH_LONG).show();

} else {
Toast.makeText(LoginActivity.this, "Connection Failed: Unable to connect to the server.",
Toast.LENGTH_SHORT).show();

}

}

else {
Toast.makeText(LoginActivity.this, "Enter all mandatory fields.",
Toast.LENGTH_SHORT).show();

}

}

});
tvRegister = (TextView) findViewById(R.id.tvRegister);

tvRegister.setOnClickListener(new View.OnClickListener() {

 @Override

public void onClick(View view) {

Intent intent = new Intent(LoginActivity.this, RegistrationActivity.class);

startActivity(intent);

 }

});

}

}
```

VOLUNTEER APP

LOGIN PAGE

```
package com.example.volunteerapp;
```

```
import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;

import android.content.SharedPreferences;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.Toast;

public class LoginActivity extends AppCompatActivity {

SharedPreferences sharedPreferences;

DBHelper dbHelper;

EditText etLoginID, etPassword;

Button btnLogin;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity_login);

sharedPreferences = (SharedPreferences) getSharedPreferences("volunteerapp",
MODE_PRIVATE);

String isLogged = sharedPreferences.getString("islogged", "no");

if (isLogged.equals("yes"))

{

Intent intent = new Intent(LoginActivity.this, MainActivity.class);

startActivity(intent);

finish();}
```

```
dbHelper = new DBHelper(this);
etLoginID = (EditText) findViewById(R.id.etLoginID);
etPassword = (EditText) findViewById(R.id.etPassword);
btnLogin = (Button) findViewById(R.id.btnLogin);
btnLogin.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
String LoginID = etLoginID.getText().toString();
String Password = etPassword.getText().toString();
if (LoginID.length() > 0 && Password.length() > 0) {
String Query = "select * from tabstaffs where loginid='" + LoginID + "' and password='" +
Password + "'";
String Result = dbHelper.CheckRecord(Query);
if (Result.equals("true")) {
SharedPreferences.Editor editor = sharedPreferences.edit();
editor.putString("islogged", "yes");
String HotelName = dbHelper.LoadRecord("select staffname from tabstaffs where loginid='" +
LoginID + "'");
editor.putString("loginid", LoginID);
editor.putString("staffname", HotelName);
editor.commit();
Intent intent = new Intent(LoginActivity.this, MainActivity.class);
startActivity(intent);
finish();
} else if (Result.equals("false")) {
```

```
Toast.makeText(LoginActivity.this, "Login Failed: Invalid Login ID or Password.",
Toast.LENGTH_LONG).show();

} else {

Toast.makeText(LoginActivity.this, "Connection Failed: Unable to connect to the server.",
Toast.LENGTH_SHORT).show();

}

}

else {

Toast.makeText(LoginActivity.this, "Enter all mandatory fields.",
Toast.LENGTH_SHORT).show();

}

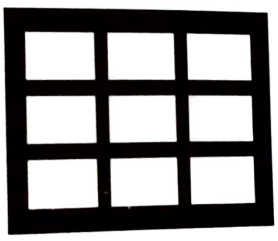
}

})

}

}
```

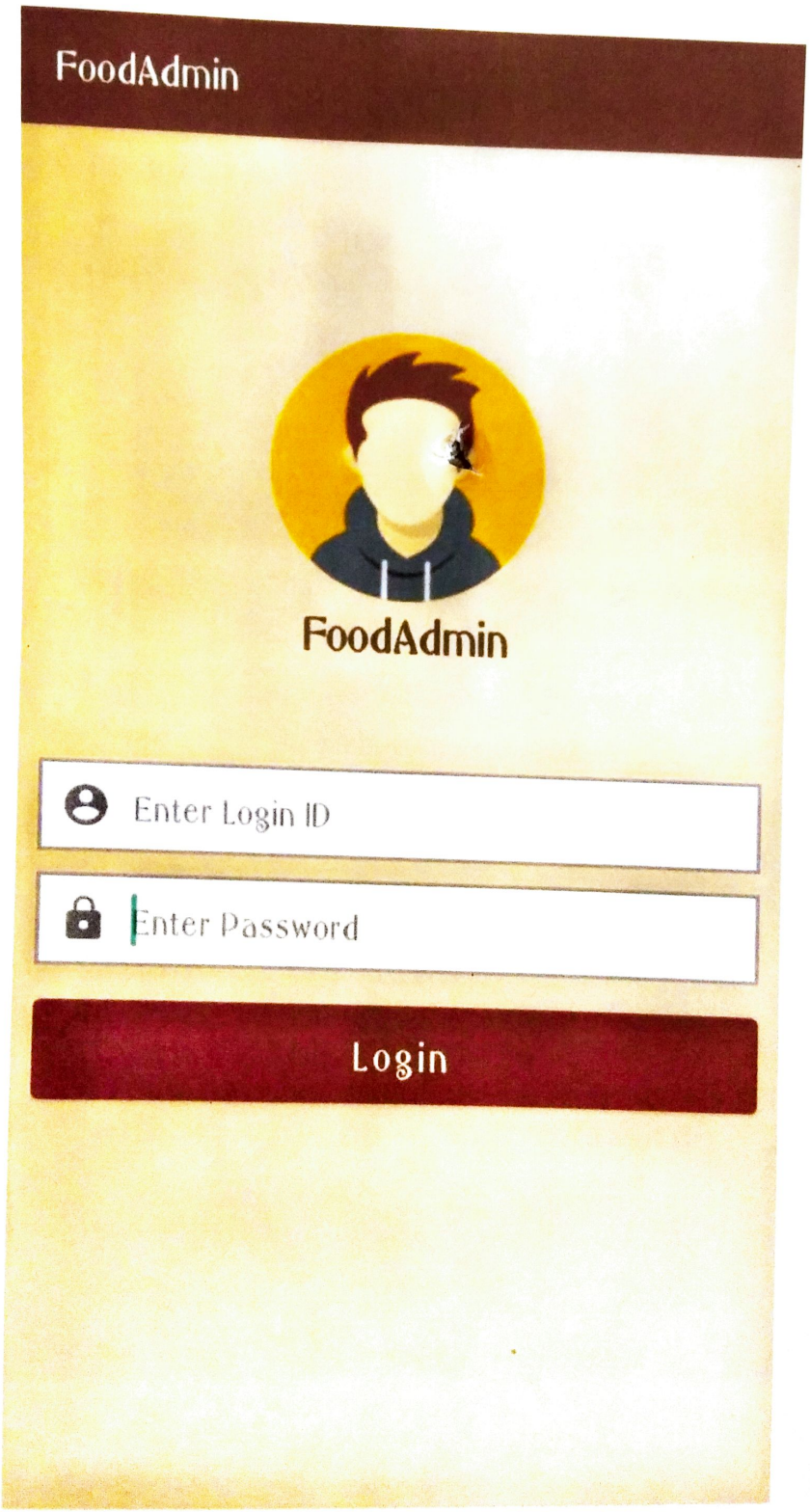
SCREENSHOTS



SCREENSHOTS

FOOD ADMIN

LOGIN PAGE



FOOD ADMIN

HOMEPAGE

RESTAURANT

LOGIN PAGE

RESTURANT APP

HOMEPAGE

VolunteerApp

VolunteerApp

Enter Login ID

Enter Password

Login

CONCLUSION

CONCLUSION

The development of this product surely prompts many new areas of investigation. This product has wide scope of implementation by making it live. Moreover this product creates many benefits for the business and the community. By taking it online it will help many people throughout the city by donating food daily. Hundreds of thousands of tons of food are either lost or wasted while millions of people suffer from malnutrition.

A plausible initiative is the food donation portal in which large retail chains and potentially other organizations can donate food. This food is collected and delivered by Third Party vendor to NGO in need. Food donation portal will help thousands of people that suffer from starvation and also consume food that are wasted with no reason. As consequence, research and actions are needed to improve the efficiency of food donation portal.

FUTURE ENHANCEMENT

FUTURE ENHANCEMENT

- In Future I will step forward to donate the food for slump area peoples.
- Marriages, canteens, restaurants, social and family get togathers and functions expel out so much food, can also be taken into consideration for distribution.

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CHILD SAFETY APP

A project Submitted to

ST. MARY'S COLLEGE (AUTONOMOUS), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

in partial fulfilment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted By

ANTONY JENITTA MARY.D

Reg.No.: 20SPCS04

Under the Supervision and Guidance of

Ms. A. Jenitta Jebamalar M.Sc.(IT), M.Sc.(CS), M.Phil., B.Ed

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi- 628001

MAY 2022

CERTIFICATE

This is to certify that this project work entitled as "**CHILD SAFETY APP**" is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to Manonmaniam Sundaranar University, Tirunelveli, in partial fulfilment for the award of the degree of Master of Science in Computer Science for the work done during the year 2021-2022 by **ANTONY JENITTA MARY.D (Reg.No.:20SPCS04).**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do hereby declare that the project entitled "**CHILD SAFETY APP**" submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Ms. A. Jenitta Jebamalar M.Sc.(IT), M.Sc.(CS), M.Phil., B.Ed.,** Assistant Professor, PG Department of Computer Science (SSC), of St. Mary's College (Autonomous), Thoothukudi.

Station: Thoothukudi **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA.,M.Phil.,Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani, Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and Coordinator, PG Department of Computer Science (SSC) for her support and counsel.

I express my hearty thanks to my guide**,** Ms. A. Jenitta Jebamalar M.Sc.(IT), M.Sc.(CS), M.Phil., B.Ed., Assistant Professor, PG Department of Computer Science (SSC) for her valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC) for her encouragement and support.

I am much indebted to Mr. N. Arunachalam M.Sc.(CS)., Proprietor., Acme Infotek for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

ABSTRACT

In today's world, people using smart phones have increased rapidly and hence, a smart phone can be used efficiently for personal security or various other protection purposes. The safety of children is a concern of increasing urgency in India and other countries. The primary issue in the handling of these cases by the police lies in constraints preventing them from responding quickly to calls of distress. These constraints include not knowing the location of the crime, and not knowing the crime is occurring at all: at the victim's end, reaching the police assuredly and discreetly is a challenge.

The evil incident that outraged the entire nation have waken us to go for the safety issues and so a host of new apps have been developed to provide security systems to children via their phones. This project presents an Android Application for the Safety of Children and this app can be activated this app by a single click, whenever need arises. A single click on this app identifies the location of place through GPS and sends a message comprising this location URL to the registered contacts and also call on the first registered contact to help the one in dangerous situations. The unique feature of this application is to send the message to the registered contacts continuously for every five minutes until the “stop” button in the application is clicked. Continuous location tracking information via SMS helps to find the location of the victim quickly and can be rescued safely.

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INTRODUCTION

This android application uses SMS services and googles geo assistance in locating the missing child's location by the survey of missing children in 2004. There are of total 5996 kids are missing. Out of those only 4092 children return or were found by police. However, 1904 children are missed. And also the kid's ages 14 years and 17 years are missed or ran far from home. The oldsters are worried about their children. By missing the youngsters, the parents are scared to go on a family trip. There are many chances to miss the child on the trip. The project is developed for those parents who have worried to miss their child. In Today's world, most of Child's have smartphones. With the assistance of smartphones, geo, and SMS-based tracking applications parents can watch on their child. Geo is combined with GSM-based SIM card into mobile to look at on Child's location. The google geo uses longitude and latitude to trace the placement the SMS (Short Message Service) is used to communicate child side and parent side applications. SMS service is used when mobile phones don't support internet connectivity. System ready to send the child's smartphone's exact location in the parent's smartphone when parent demand to test the child's location.

Children's security is the main aim of this application. For a parent it is risky to give children with school bus driver. Will they reach school? Will the driver drive bus within speed limit? Will he bring them to home safely? Will he follow the proper root to home? All such question will come to the parent, so there is a need to solve these questions. This application Secure Child will be very helpful to such worried parents and assures them the safety of children. Internet has brought revolution in the field of communication. One can use internet for various purpose but the main aim of internet is sharing of information. The most useful application of internet is web services where internet plays a very important role.

This Smartphones have changed the world as we can do almost everything from them. Faster Internet connections, calling features and the smart user interface has attracted many people to go for smartphones and almost everyone has access to it. Many businesses are using Android smartphones to launch their app for ease of doing business. There are many scopes of android based smartphones, one such is the „security for users", which can be achieved by using

different sensors and APIs of the Android operating system. Security of women has been a major concern for our society, women feel uncomfortable walking alone at night and avoid going to deserted places. Many cases of sexual and mental harassment against women are scared to work in an environment where a number of male employees are more. Parents are scared to send their girls to night parties, hangouts, and other places. People from different age groups are also getting mentally and sexually harassed in different places like school, college, workplaces, and public transports, etc, and they keep quiet about these problems and they don't have any means to ask for help in such a situation in India. Children are also getting harassed and bullied in schools and colleges and they are unable to ask for help. According to Wikipedia, over 14% of students from high school consider suicide, and 7% of them attempt suicide. Students that bullied are around 2 to 9 times more likely to consider suicide than non-victims. A study from Britain says that in young people more than suicide is related to bullying. Since abduction cases are increasing, parents always worry when their small kid come late to home, and they always want to know their whereabouts. Many non-government and government agencies are working constantly to solve these problems.

OBJECTIVES

- This app can be used to track location and send it to different emergency contacts, ask for help when getting bullied and harassed by someone, and call police when there is emergency.
- This App is developed carefully with simple and easy to understand user interface for users to easily access and use the app in emergency without any confusion.
- The app should be capable of installing in any android-based devices with API level greater than 20.
- The app has the feature of recording audio and video for later recognizing the criminals. The app is fully dedicated to provide features for child and women security.

SYSTEM SPECIFICATION

HARDWARE REQUIREMENTS

COMPONENT	SPECIFICATION
CPU	Intel Dual Core 2.4 GHz or Later
RAM	2GB DDR2
Hard Disk	160 GB
Display	Wide VGA (Video Graphics Array)
Input	Keyboard and Mouse
Optional Devices	Android Phone (Jelly Bean 4.2 or higher)

SOFTWARE REQUIREMENTS

COMPONENT	SPECIFICATION
Front End	Android
Back End	MySQL
IDE	Android Studio
Language	Java
Platform	Windows 7 or later
Database Server	XAMPP

PROJECT DESCRIPTION

The project entitled Child Safety App has following modules:

- User Module
- Guardian Module
- Location Module
- Alert Module

USER MODULE

In this module, user can register their accounts in their smart phones and login to the main page of the app. The app uses one time registration so that enables fast retrieval of local information. In the registration process, the student can upload the basic information along with guardian details and contact number and secure authentication password for login purpose. The login and profile details are available in centralized server. The application regularly updates the user location and the location will be available to the guardian app.

GUARDIAN MODULE

In this module, the guardian can use separate smart phone to register for their child safety. The login details will be simple; it does require the guardian phone number only. The Child Location will be available to the guardian app in the main screen.

LOCATION MODULE

In this module, user location will record in the centralized server in regular interval of one minute. The location usually contains the Latitude and Longitude position and the position will be available in the Google Map API of the User App and Guardian App. For the recording of location parameter, user must turn on Mobile Data and Location settings in their phones.

ALERT MODULE

In this module, it generates a very high-volume scream in times of distress when the lungs of a person fail in screaming in trouble. The generated scream is in a child's voice is severely helpful in discouraging the potential strong trouble makers. The only work done by this application is whenever the person pushes or touches the application, the phone screams loudly and SMS will send to the guardian phone.

SYSTEM STUDY

EXISTING SYSTEM

In the existing system there is no monitoring system for girls, it should create many problems for them and the no safety mechanism to protect the girls from the misbehaviour activities. In addition, in the existing system there is no alert mechanism for the girl's safety, it should be done by manually only.

DISADVANTAGES

- All the existing systems must be connected to the GPRS service to work properly, hence cannot be used during emergency if there is no internet connectivity.
- There is no hidden camera detector which is portable to ensure our privacy.
- Monitoring was tedious.
- Mischance in arriving rate.

PROPOSED SYSTEM

We proposed in this project. an Android Application is used to find the location and send the location to the group of people stored in the phone, SOS Message, Track your phone and additionally we used a technique of clicking the volume button, if the button is pressed on time then message alert, second if button is pressed two times then message and audio and third if the button is pressed long time then.

ADVANTAGES OF PROPOSED SYSTEM

- Easy tracking in Map
- Get the best route to the kid
- Child phone will alert the parent.

SYSTEM ANALYSIS

FEASIBILITY STUDY

1. Technology & System Feasibility:

Feasibility study of technology and system depends on the interface design of how android application is interactive, best visualized and user-friendly for architectural students and on the system functionalities how the features of architectural application are best and useful and also on hardware availability.

2. Human-Factor/Time Feasibility:

Feasibility study of human-factor and schedule depends on user background so that user can set their on background and on comfortability, how the user is able to use the application efficiently and produce meaningful and precise output and also on user's demands, project deadlines and readiness that how the application fulfils the flexibility and requirement of the users.

3. Financial Feasibility:

Economy feasibility study depends on infrastructure cost, Maintenance cost and overall solution cost of proposed application.

4. Legal Feasibility:

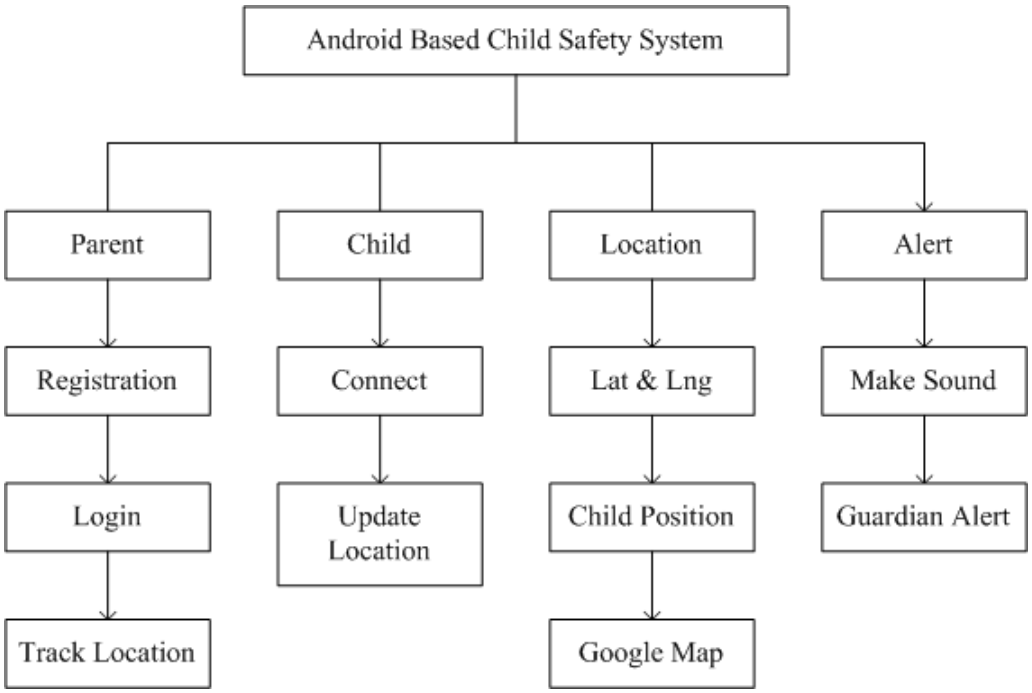
Legal feasibility depends on privacy, security and legal concerns such as data privacy, accountability, nepotism , and many more.

5. Operational/Resource Feasibility:

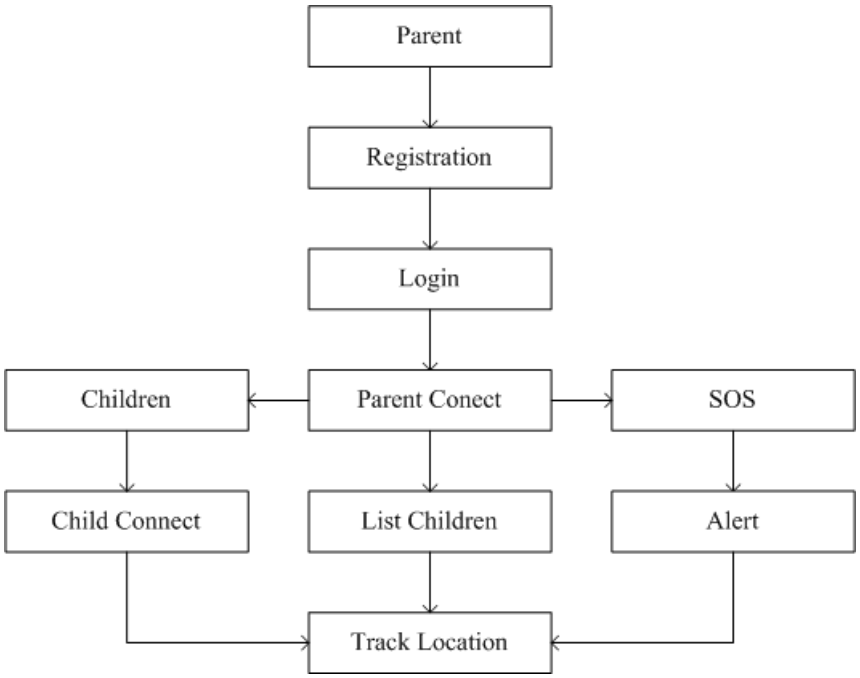
It depends on how application (system) solves the problems and satisfies the requirement of users by using some operational parameter such as affordability, reliability, disposability, maintainability, sustainability, usability, supportability, producibility and resource feasibility depends on time availability and amount of resources.

SYSTEM DESIGN

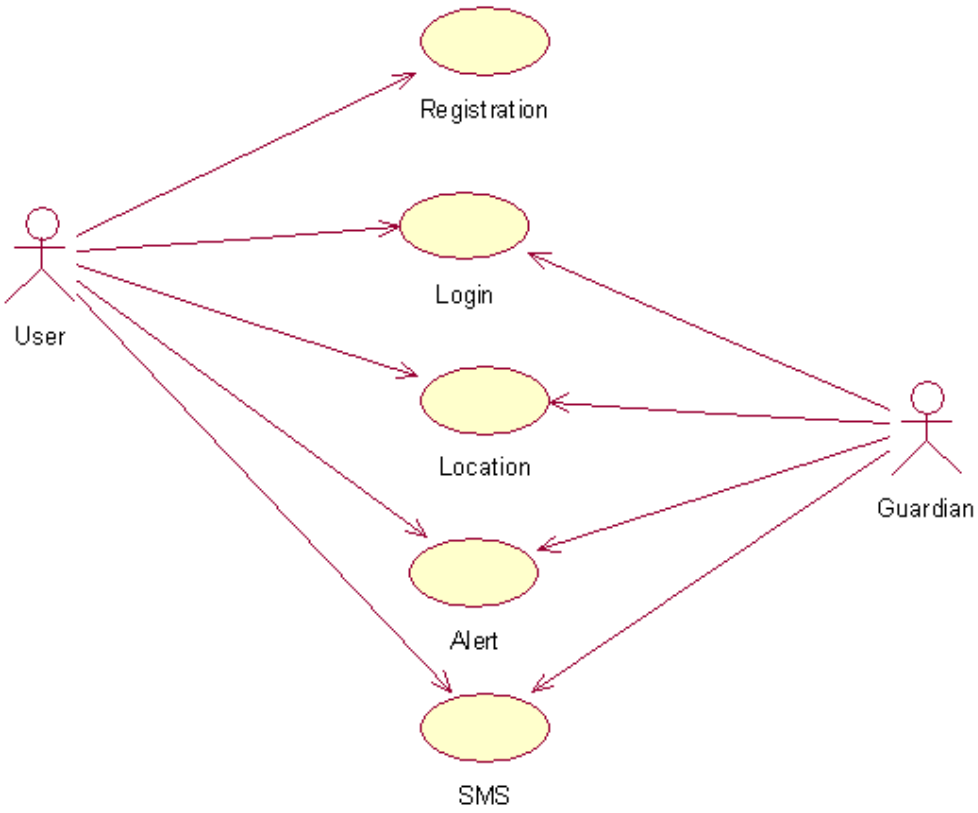
ARCHITECTURE DIAGRAM



FLOW DIAGRAM



USE CASE DIAGRAM



SYSTEM TESTING

SYSTEM TESTING

Before applying method to design effective test cases, a software engineer must understand the basic principles that guide software testing. Davis (DAV95) suggests a set of testing principles which have been adapted for use in this book.

- All tests should be traceable to customer requirements.
- Test should be planned long before testing begins.
- Test pare to principle applets to software testing.
- Testing should begin “in the small” and progress towards testing “in the page”
- Exhaustive testing is not possible.

UNIT TESTING

Unit testing focuses on verification errors on the smallest unit of software design-the module. Using the procedural design description as a guide, important control paths are tested to uncover errors within the boundary of the module.

The module interface is tested to ensure that the information properly flows into and out of the program unit under test. Boundary conditions are tested to ensure that the module operates properly at the boundaries established to limit of restrict processing.

WHITE BOX TESTING

White box testing is some time is called glass box testing, is a test case design that uses a control structure of the procedural design to drive the test cases. Using white-box testing methods, the software engineer can drive test cases that

- Guarantee that logical decisions are on the true and false sides
- Exercise all logical decisions are on the true and false sides
- Execute all loops at their boundaries and within their operational bounds
- Exercise internal data structure to assure the validity

BLACK BOX TESTING

Black box testing focuses on the functional requirements of the software. That is black box testing enables the software engineer to drive a set of input conditions that will fully exercise the requirements for a program.

Black box testing is not an alternative for white box testing techniques. Rather, it is a complementary approach that is likely to uncover different class of errors.

Black box testing attempts to find errors in the following categories:

- Interface errors.
- Performances in data structures or external database access.
- Performance errors.
- Initialization and termination errors.
- Incorrect or missing functions.
- All the above-mentioned errors were checked in the process of black.

CODING

LOGIN.PHP:

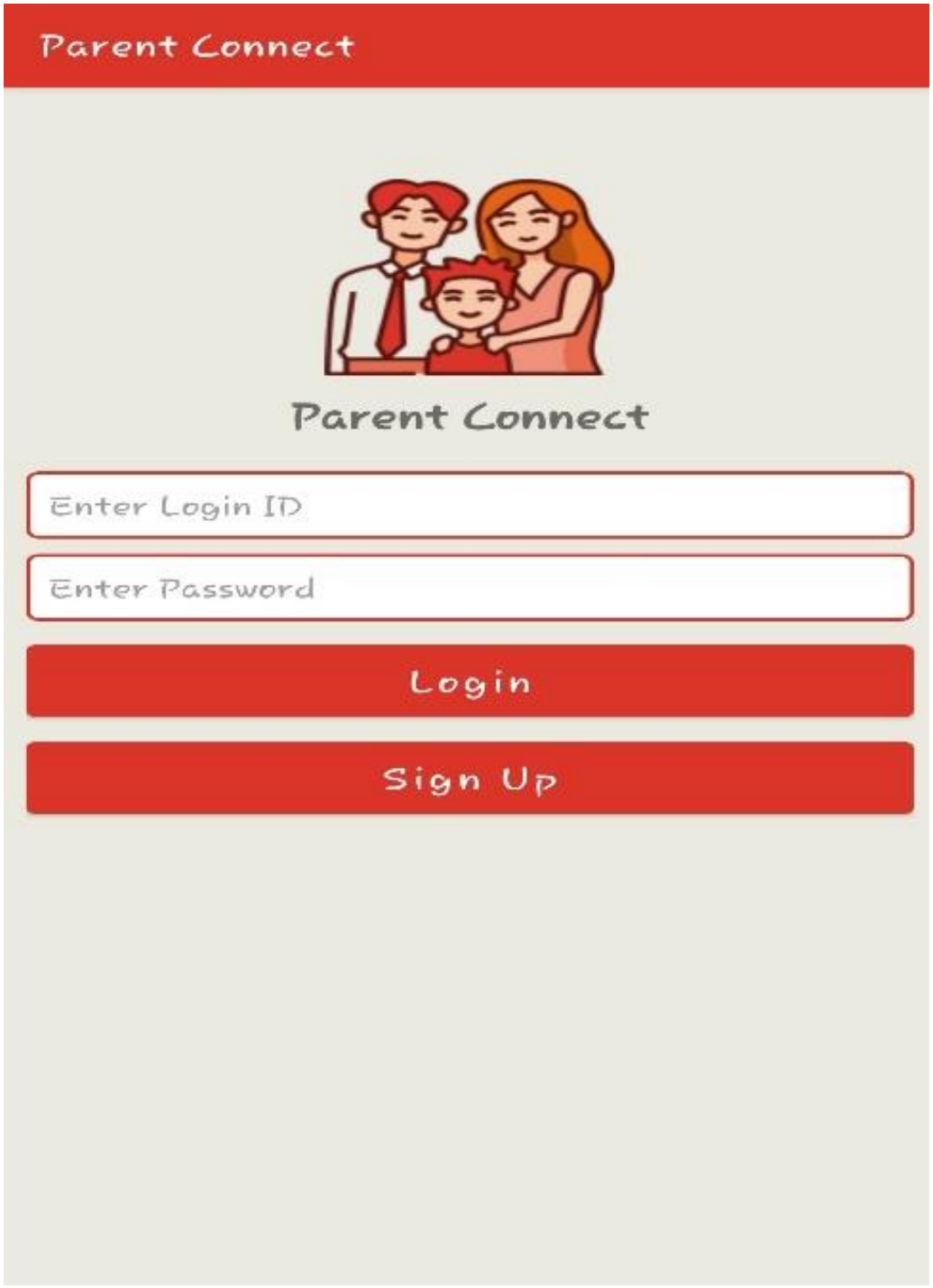
```
<?php
include("dbcon.php");
$parentname = $_GET['parentname'];
$mobilenumber = $_GET['mobilenumber'];
$loginid = $_GET['loginid'];
$password = $_GET['password'];
$query = "select * from tabusers where loginid='$loginid'";
$result = mysqli_query($con, $query);
if (mysqli_num_rows($result) == 0)
{
$query = "insert into tabusers (parentname, mobilenumber, loginid, password) values('$parentname', '$mobilenumber', '$loginid', '$password')";
mysqli_query($con, $query);
if (mysqli_affected_rows($con) > 0)
{
echo "ACCOUNT_REGISTERED";
}
}
else
{
echo "ACCOUNT_EXISTS";
}
?>
```

REGISTER.PHP:

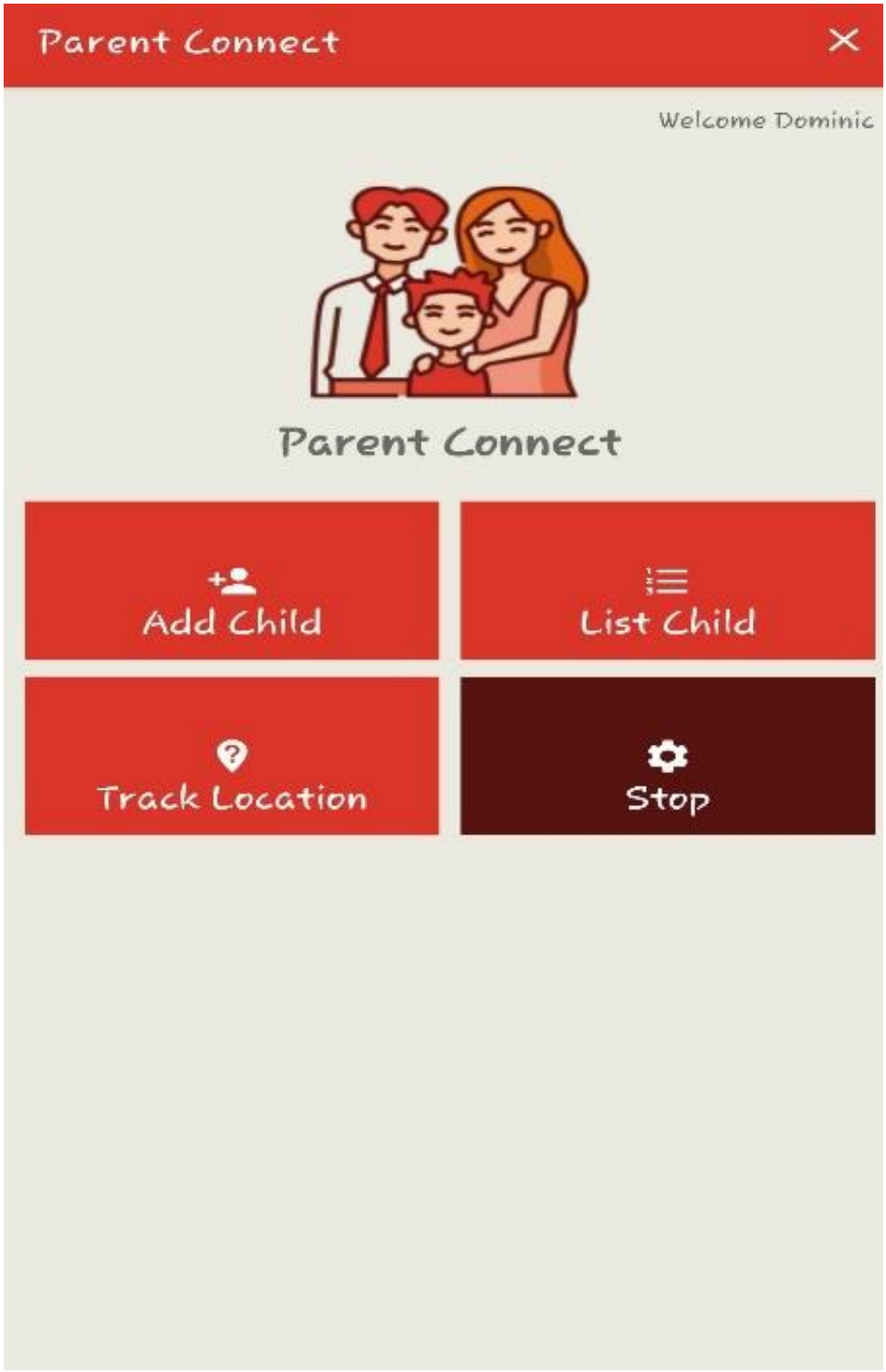
```
<?php
include("dbcon.php");
$parentname = $_GET['parentname'];
$mobilenumber = $_GET['mobilenumber'];
$loginid = $_GET['loginid'];
$password = $_GET['password'];
$query = "select * from tabusers where loginid='$loginid'";
$result = mysqli_query($con, $query);
if (mysqli_num_rows($result) == 0)
{
$query = "insert into tabusers (parentname, mobilenumber, loginid, password)
values('$parentname', '$mobilenumber', '$loginid', '$password')";
mysqli_query($con, $query);
if (mysqli_affected_rows($con) > 0)
{
echo "ACCOUNT_REGISTERED";
}
}
else
{
echo "ACCOUNT_EXISTS";
}
?>
```

SCREENSHOTS

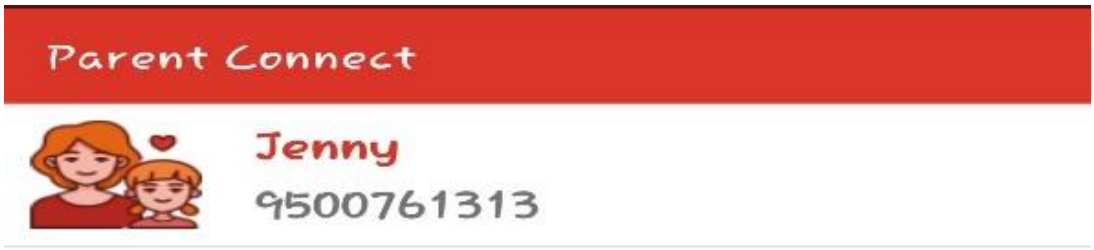
LOGIN PAGE:



WELCOME PAGE:



CHILD LIST:



TRACK LOCATION:

CHILD LOGIN:


ChildApp
ChildApp
Enter Child Mobile Number
Enter Password
Login

CHILD SOS:


ChildApp
Welcome Jenny
Your Location will be send to your parent app every 5 min.
SOS

CONCLUSION

The system has presented a Smart safety device for child monitoring using Android. It provides efficient monitoring of child with the help of GPS and GSM based Technology. This app can be used to track location and send it to different emergency contacts, ask for help when getting bullied and harassed by someone, and call police when there is emergency. This App is developed carefully with simple and easy to understand user interface for users to easily access and use the app in emergency without any confusion. The proposed system provides communication between parent and child. It provides parents with the real time Location, and the ability to locate their child or alert by standers in acting to rescue or comfort the child. The application keeps track of the child periodically and updates the status of child to the user. Thus, the parents are always kept aware of their Child constantly

FUTURE ENHANCEMENT

For surveillance of the child's surroundings, to get a clearer picture of the location, this wearable can also contain a camera module incorporated in it. The camera will be collecting information in the same manner as the GPS module. It will be on standby conserving power waiting for the particular keyword "SNAPSHOT" to be sent from the user's smart phone to the GSM shield will activate the camera to start clicking a snapshot of the surrounding and save the file temporarily on the external microSD card. After which Arduino Uno will access the saved image from the microSD storage and transfer it to the GSM module which send it to the user via SMS/MMS text.

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   Author: Luke Welling

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   Author: Richard Blum

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- https://www.javatpoint.com/android-tutorial
- https://www.vogella.com/tutorials/android.html

FARMER EQUIPMENT TRACKER APP

A project Submitted to

ST. MARY'S COLLEGE (AUTONOMOUS), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

in partial fullfilment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted By

BRISKILLA.L

Reg.No.: 20SPCS05

Under the Supervision and Guidance of

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MAY 2022

CERTIFICATE

This is to certify that this project work entitled as "**FARMER EQUIPMENT TACKING**" is submitted to St. Mary's College (Autonomous), Thooothukudi affiliated to **Manonmaniam Sundaranar University, Tirunelveli,** in partial fulfillment for the award of the degree of Master of Science in Computer Science for the work done during the year 2020-2021 by **BRISKILLA.L (Reg.No.:20SPCS09).**

Signature of the Guide

Signature of the Co-ordinator

Signature of Director
Director
Self Supporting Courses
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Thoothukudi - 628 001.

Signature of Principal
Principal
St. Mary's College (Autonomous)
Thoothukudi - 628 001.

Signature of the Examiner

DECLARATION

I do hereby declare that the project entitled "**FARMER EQIUPMENT TRACKING**" submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Ms.C.NAYANTHRA MASCARENHAS M.Sc., M. Phil., SET(Coordinator)**. Assistant Professor, PG Department of Computer Science (SSC), St.Mary's College (Autonomous), Thoothukudi.

L. Brisilla

Signature of the Student

Station: Thoothukudi

Date: 23/05/2022

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to **Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani, Director of SSC,** St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

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I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

Acme Infotek

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Date: 14-05-2022

To

The Head of the Department
PG Department of Computer Science (SSC)
St. Mary's College (Autonomous)
Thoothukudi

Dear Sir/Madam,

Sub: Project Completion Certificate-Reg

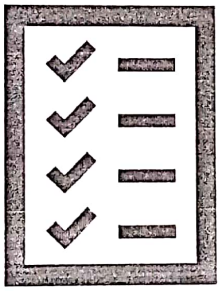
On behalf of **Acme Infotek**, we are pleasure to inform you that **Miss. L. Briskilla, Reg No: 20SPCS05** studying **M.Sc., Computer Science** Final year has been done the project work at our concern on "**Farmer Equipment Tracker**" during the period from February 2022 to May 2022.

During this period, we noticed her to be diligent, sincere and hardworking and she accomplished her task within stipulated deadline. We wish her for all future endeavours.

PROJECT DIRECTOR

ACME INFOTEK Tirunelveli

ABSTRACT



ABSTRACT

Agriculture continues to be the most important sector of the Indian economy and agriculture is a more or less a compulsion for livelihood of millions of farmers. Land and water resources have almost reached their limits, price of commodities are fluctuating almost every day, profit are negligible for most of the marginal and small farmers and most of all getting information is cumbersome. In Indian most of the population is dependent on agriculture so there is a need to review and revitalize the mechanism for updating the technology. Majority of the Indian farmers are small-scale producers and are often unable to access the information and technological resources that could increase the yield and lead to better prices for their crops and products. The main purpose of our project is to find the availability and location of resources or equipments for farming. This equipment includes Tractors, Maize Husker, Round Straw Baler, Motorized Shredder, Rice Transplanter, etc. The farmers can register their account in our android application and add their equipments available in their premises along with their details and cost. Also the farmers can search for any agriculture equipments in the app and find out the product detail and reachable distance through Google Map. Our application uses android Google Map navigation API to locate the machinery by GPS co-ordinates. This system will help the farmers to find the best and cost efficient machines and resources in most easiest way.

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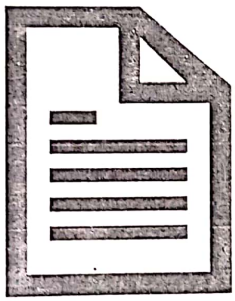
INTRODUCTION



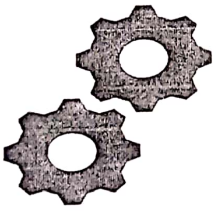
INTRODUCTION

In India Farmers Faced many problems because they do not know technical and technology skills. Mobile phones have become an integral part and personality of the present generation and they like to embrace all the things in the scope of this modern technology. This modern generation is much more advanced of usage of modern technical gadgets. In fact, a lot of research is happening on the use of mobiles. So the project team decided to introduce a mobile application to the farmers. Farmers cannot find the actual merchants, they do not know the actual prices, they do not know the suitable market for their sales, and also they cannot predicate the actual weather and price of their cultivation. There are no such a web/mobile apps in India to increase the cultivation and sales and also there are no apps to help to the farmers.

Smart Cultivation Partner Mobile apps Service helps the farmers to work with the motive of greater profitability by direct communication between farmer-to- Merchant, farmer-to-farmer and also farmers can know the contact details of the relevant agriculture and agrarian department .This service also provides new technology features news introduced in cultivations, new fertilizer, new crops details to the farmers. This service boosts business communication and brings transparency in the system. This innovative site allows a good farmer, retailer and Merchant communication. It provides an option of login to farmers and communicates to respective dealers. The farmers also have an option to submit their grievances and complaints to respective dealers or authorities using their farmer login on a separate complaints page and authorities will get access to that page regularly using their login id and passwords. The proposed system has lot of benefits to the user that are , Separate login areas with appropriated functionality for farmers, Merchants and administrator. An effective Graphical User Interface (GUI) so that rural people may easily use the service, this app can be used in languages (English), this app locate the actual location of the farmer and provide the suitable details, new technology news and videos can post to the farmers.

A separate page where only farmers can post complaints and only assigned administrators can read and edit the page features. Farmers are notified of these notifications via Short Message Service (SMS) whenever new advertisements are published. Can be over for multiple villages to communicate and deal with each other. Farmers can directly contact Merchants by searching online. Farmers may submit their grievances online. Farmers get notification of any new offers/schemes. Farmers can compare price in different areas. To overcome these issues project I have decided to propose this project to make the farming environment more efficient and productivity.

SYSTEM SPECIFICATION



2 SYSTEM SPECIFICATION

2.1. HARDWARE SPECTIFICATION

COMPONENT	SPECIFICATION
CPU	Intel Dual Core 2.4 GHz or Later
RAM	2GB DDR2
Hard Disk	160 GB
Display	Wide VGA (Video Graphics Array)
Input	Keyboard and Mouse

2.2. SOFTWARE SPECIFICATION

COMPONENT	SPECIFICATION
Front End	Android
Back End	MySQL
IDE	Notepad++
Platform	Windows 7 or later
Database Server	XAMPP

PROJECT DESCRIPTION

PROJECT DESCRIPTION

OVERVIEW OF THE PROJECT:

This project introduces the architecture and component models of Android, and analyzes the anatomy of an Android application including the functions of Activity, Intent Receiver, Service, SMS, and etc. Based on Android, the design method of a location-based mobile service is then presented. The design example shows that it's so easy to implement location application which fetches latitude and longitudinal values and sends through the desired phone number.

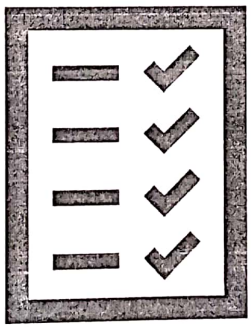
OBJECTIVE OF THE PROJECT:

The main objective of the project is routing and tracking farming equipments in a large area environment based on the Global Positioning System (GPS) and Global System for Mobile Communication (GSM). The system uses GPS for locating the position of vehicle. We will also find the speed of the vehicle in real time.

AIM OF THE PROJECT:

The main aim of the project is to find the location of an object either stationary or moving. Some of tracking systems require special hardware devices to be installed for example in some of farming vehicle and asset tracking systems, but however this can also be achieved by mobile positioning. Mobile positioning, which is a Location-based service that can provide with the actual coordinates of a mobile phone user. This is a technology used by telecommunication companies to find the location of a mobile phone user.

MODULE DESCRIPTION



MODULE DESCRIPTION

MODULES:

- Farmer Identity Management
- Farming Equipments
- Search
- Location Tracking
- Notification

FARMER IDENTITY MANAGEMENT:

- In this module, farmers can register account using user profile.
- The user profile includes name of the farmer, address, city, mobile, email, login ID, password.
- The login ID will be used as unique identity for each farmer.
- The default constraint for login ID and passwords will be minimum of 4 characters length.
- The farmer profile can later used to displayed in the selection of farming equipments.

FARMING EQUIPMENTS:

- In this module, farmers can add the equipments along with the category and rental of the equipments.
- The farmers can also edit or delete the farming equipments.
- The categories includes Agriculture Implements, Grain Processing Machine, Brush Cutter and Accessories, Sprayers, Tillers and Cultivator, Lawn Mower, and Shredder etc.
- The cost basis can be calculated on two types, either day basis or hour basis.

SEARCH:

- In this module, the farmers can search for the specified equipments and result will be displayed in tabular format.

- Later the entries can be verified and the farmers can call or send simple message the equipment owner.
- The current location of the equipment owner can also be shown in the search module.
- The current location will displayed in the Google map API.

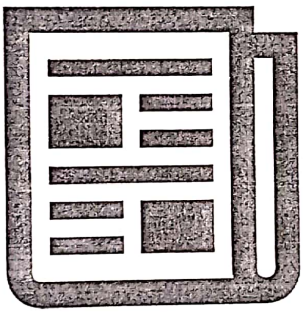
LOCATION TRACKING:

- In this module, a GPS enable smart phone is required for tracking the live location of farming equipment.
- The tracking code will be track the location of equipment owner's mobile phone. In order to track the location, the farmers has to enable the location services in the smart phone.
- The system will automatically retrieve the location as the minor changes in the current location.
- Later this location co-ordinates will be displayed in the Google map API.

NOTIFICATION:

- In this module, the farmers can request the equipment owners about the availability of the equipment through voice call or SMS or notification message.
- The Call and SMS button only be available to equipment owners who registered their mobile numbers.
- The notification menu shows the all the incoming notification messages about the equipment needs and the sender of the request for the same.

SYSTEM STUDY



SYSTEM STUDY

EXISTING SYSTEM:

In this existing system, a novel method called location-based delivery (LBD), which combines the short message service (SMS) and global position system (GPS), is proposed, and further, a realistic system for tracking a target's movement is developed. LBD reduces the number of short message transmissions while maintaining the location tracking accuracy within the acceptable range. This existing approach, LBD, consists of three primary features: Short message format, location prediction, and dynamic threshold. The defined short message format is proprietary. Location prediction is performed by using the current location, moving speed, and bearing of the target to predict its next location. When the distance between the predicted location and the actual location exceeds a certain threshold, the target transmits a short message to the tracker to update its current location. The threshold is dynamically adjusted to maintain the location tracking accuracy and the number of short messages on the basis of the moving speed of the target.

DISADVANTAGES OF EXISTING SYSTEM:

- The system leaves the Android mobile phones vulnerable.
- The simplicity of Android mobile phones can let the thief get an easy access.

PROPOSED SYSTEM:

A farmer tracking system is one in which the correctness of the computations not only depends upon the logical correctness of the computation but also depend upon the time in which the result is produced. The real time systems process inputs, take correct way of decisions and also generate output necessary to control the peripherals connected to them .This system viewed as organized collection of software extensions of hardware, consisting of control routines for operating a computer and generating an environment for execution of programs. Most real time systems interface with and control hardware directly. Real time Applications can be either in the form embedded applications or non embedded (desktop)application.

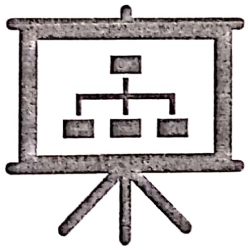
Most of today's real time embedded systems are like to work in dynamic environments, where the characteristics of the computational load cannot always be predicted in advance. The proposed system describes mobile phone location tracking system which has the following objectives:

- Develop an Android application which is used to receive GPS location and a web application that can be used to track mobile phone's location.
- This application can track the last location of farmer's mobile phone.
- Previous locations can be tracked.

ADVANTAGES OF PROPOSED SYSTEM:

- The user interface is very simple and has an easy accessibility.
- The data stored in the cloud can also be easily accessed through the mobile phones.
- Cost efficient

SYSTEM ANALYSIS



SYSTEM ANALYSIS

FEASIBILITY STUDY:

Feasibility study is the both necessary and prudent to evaluate the feasibility of a project at the earliest possible time. It also involves preliminary investigation of the project and examines whether the designed system will be useful to the organization. Months or years of effort, thousand for millions of dollars and untold professional embarrassment can be averted if an ill-conceived system is recognized early in the definition phase.

OBJECTIVE OF FEASIBILITY STUDY :

The objective is to study the scope of the problem in the project before it happens and also avoid the situation of loss.

FEASIBILITY STUDY PARTS :

The parts of feasibility study as follows:

- Economic feasibility
- Technical feasibility
- Functional feasibility

ECONOMIC FEASIBILITY :

Economic feasibility deals about the economical impact faced by the organization to implement a new system. It is an evaluation of development cost weighed against the ultimate income or benefit derived from the developed system .Very important information 8 contained in the feasibility study is that it takes care of the cost benefit analysis, which is the assessment of the economic justification for a computer based system project.

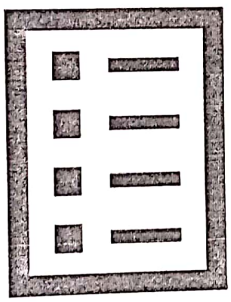
TECHNICAL FEASIBILITY:

It deals with study of function, performance and constraints that may affect the ability to achieve an acceptable system .According to the proposed plan, it needs minimum hardware configuration as specified software requirement. The latest technology is incorporated so as to achieve the best of this new development on the system. The system has been developed fully generalized, so that any future expansion will not be a problem.

FUNCTION FEASIBILITY :

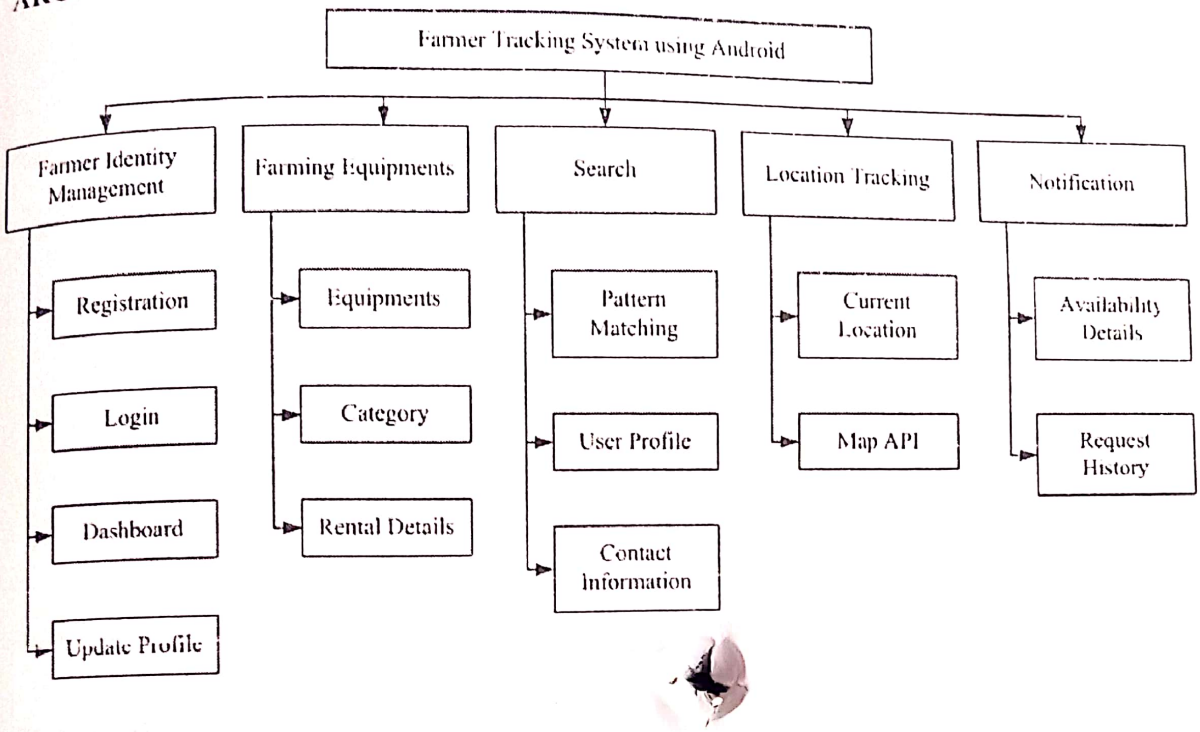
The operations are completely computerized. The current existing system is less interactive and up to the mark in terms of user support. Data retrieval and interaction to end-user is the main objective of this proposed project .So the objective of this proposed system can be fulfilled .The proposed system produces efficient results, quickly and timely information retrieval, high performance and above all user-friendly.

SYSTEM DESIGN

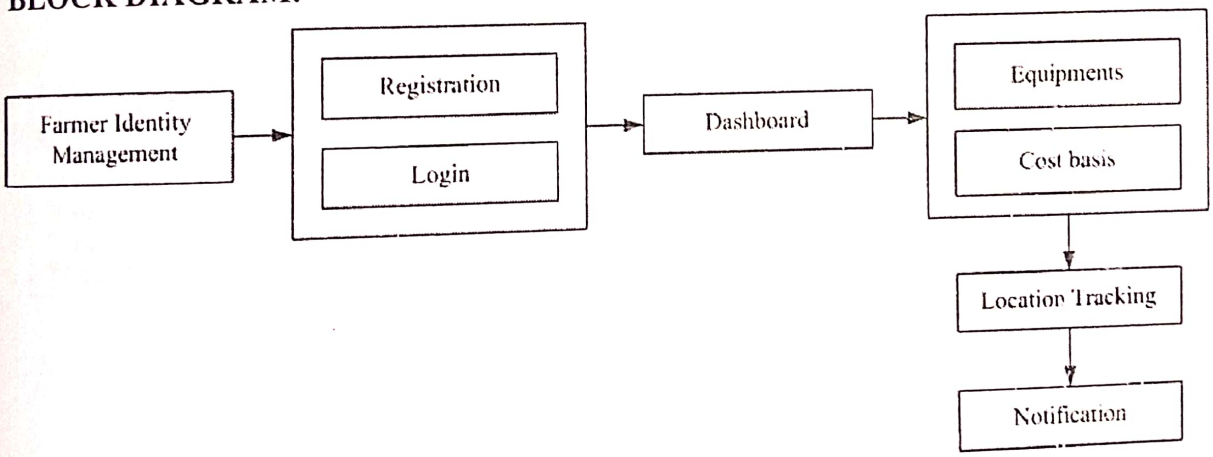


SYSTEM DESIGN

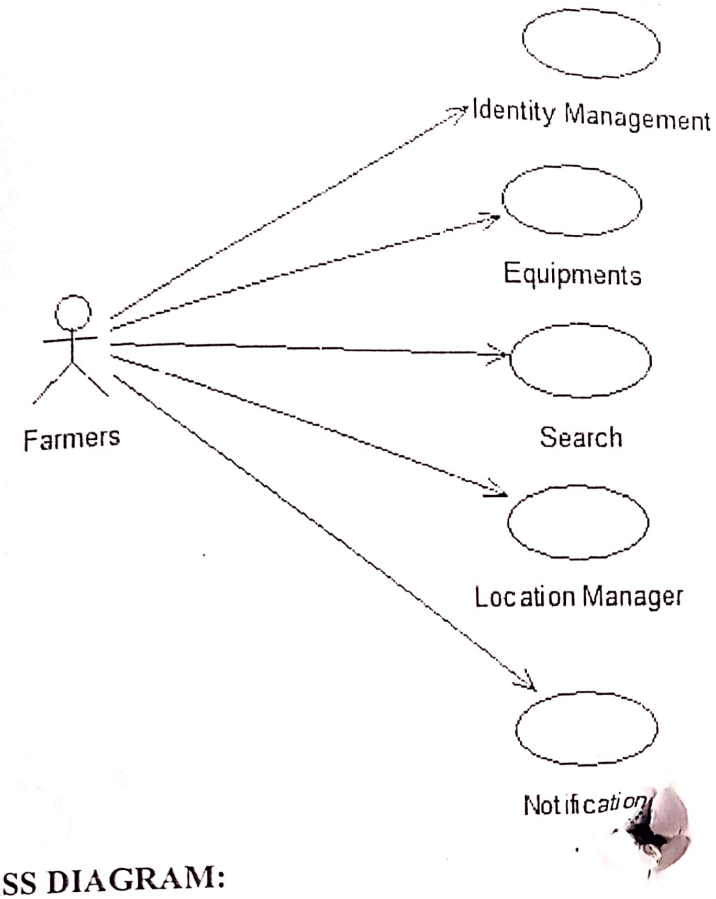
ARCHITECTURE DIAGRAM:



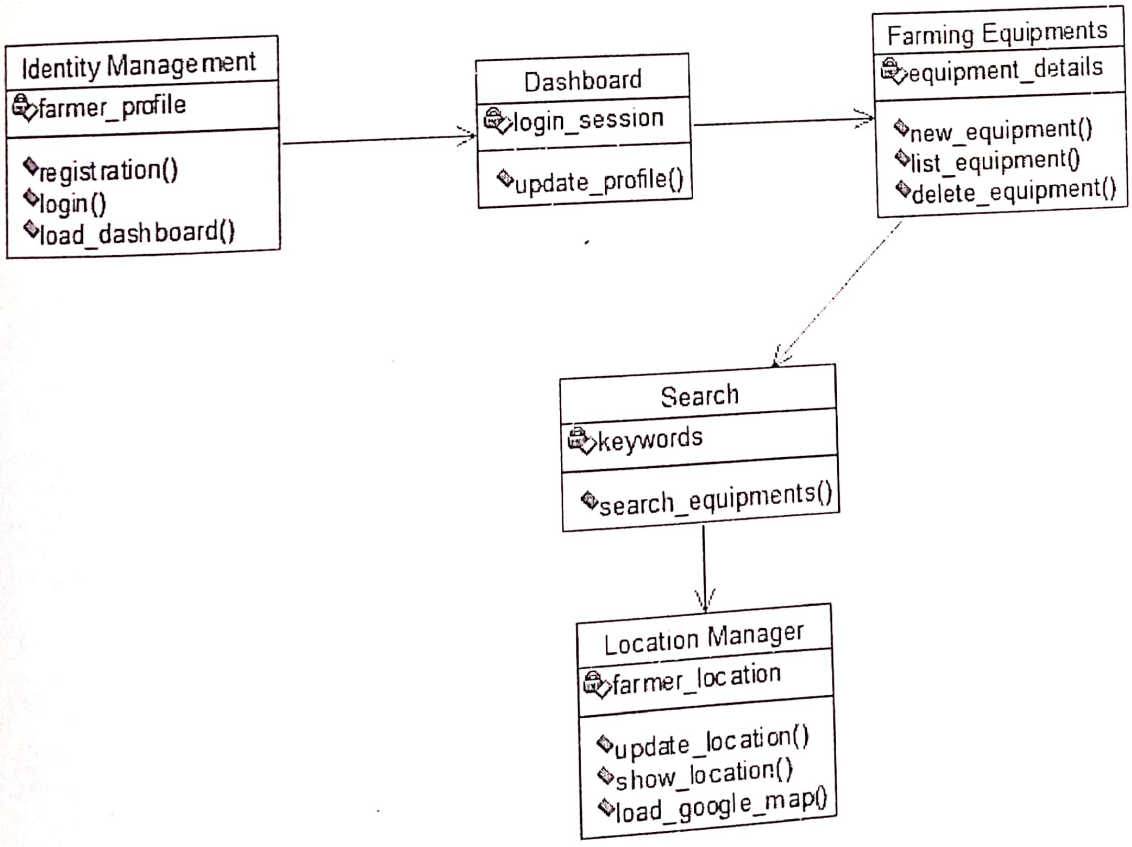
BLOCK DIAGRAM:



USECASE DIAGRAM:



CLASS DIAGRAM:



SYSTEM TESTING

SYSTEM TESTING

System testing is actually a series of different tests whose primary purpose is to fully exercise the computer based system. Although each test has a different purpose all work should verify that all system element have been properly integrated and perform allocated functions. System testing of software or hardware is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing falls within the scope of black box testing, and as such, should require no knowledge of the inner design of the code or logic. As a rule, system testing takes, as its input, all of the "integrated" software components that have passed integration testing and also the software system itself integrated with any applicable hardware system(s).

TYPES OF TESTING:

- Unit testing
- Integration testing
- Validation testing
- Acceptance testing

UNIT TESTING:

Unit testing focuses on verification errors on the smallest unit of software design-the module. Using the procedural design description as a guide, important control paths are tested to uncover errors within the boundary of the module.The module interface is tested to ensure that the information properly flows into and out of the program unit under test. Boundary conditions are tested to ensure that the module operates properly at the boundaries established to limit of restrict processing.

INTEGRATION TESTING:

Integration testing is a systematic technique for constructing the program structure while conducting test to uncover errors associated with interfacing. The objective is to take unit tested modules and build a program structure that has been dictated by design.

WHITE BOX TESTING:

White box testing is some time is called glass box testing, is a test case design that uses a control structure of the procedural design to drive the test cases. Using white-box testing methods, the software engineer can drive test cases that

- Guarantee that logical decisions are on the true and false sides
- Exercise all logical decisions are on the true and false sides
- Execute all loops at their boundaries and within their operational bounds
- Exercise internal data structure to assure the validity

ACCEPTANCE TESTING :

Finally when the software is completely built, a series of acceptance tests are conducted to enable the client to validate all requirements. The user conducts these tests rather than the system developer, which can range from informal test drive to a planned and systematical executed series of tests. These acceptance tests are conducted over a period of weeks or months, there by uncovering cumulative errors that might degrade the system order time. In this process alpha testing and beta testing are used to uncover the errors that only the end user seems able to find.

ALPHA TESTING:

The customer conducts the alpha test at the developer's site. The client notes the errors and usage problems and gives report to the developer. Alpha tests are conducted in a control environment.

BETA TESTING:

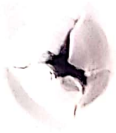
The beta testing is conducted at one or more customer's sites by the end users of the software. Unlike the alpha testing, the developer is not present. Therefore a beta test is a "live" application of the software in the environment that cannot be developed by the developer. The customer records all the problems encountered during the beta testing and reports these to the developers at regular intervals.

BLACK BOX TESTING:

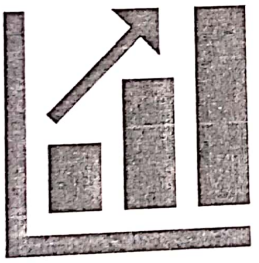
Black box testing focuses on the functional requirements of the software. That is black box testing enables the software engineer to drive a set of input conditions that will fully exercise the requirements for a program. Black box testing is not an alternative for

white box testing techniques. Rather, it is a complementary approach that is likely to uncover different class of errors. Black box testing attempts to find errors in the following categories:

- Interface errors.
- Performances in data structures or external database access.
- Performance errors.
- Initialization and termination errors.
- Incorrect or missing functions.



CODING



CODING

FARMER EQIUPMENT TRACKER:

LOGIN:

```
package com.example.farmchat

import android.content.Context;

import android.content.res.Resources;

import android.os.AsyncTask;

import java.io.BufferedReader;

import java.io.InputStream;

import java.io.InputStreamReader;

import java.net.HttpURLConnection;

import java.net.URL;

public class LoginTask extends AsyncTask<String, Void, String> {

private Context context;

private String link;

private String Username, Password;

public LoginTask(Context context) {

this.context = context;

}

@Override

protected String doInBackground(String... strings) {

String result = "";

Try

{
```

```
Username = (String) strings[0];

Password = (String) strings[1];

Resources resources = context.getResources();

link = resources.getString(R.string.server_ip) + "login.php?Username=" +          Username
+ "&Password=" + Password;

URL url = new URL(link);

HttpURLConnection client = (HttpURLConnection) url.openConnection();

client.setRequestProperty("User-Agent", "");

client.setRequestMethod("POST");

client.setDoInput(true);

client.connect()

InputStream inputStream = client.getInputStream();

BufferedReaderin=newBufferedReader(new InputStreamReader(inputStream));

StringBuffer sb = new StringBuffer("");

String line="";

while ((line = in.readLine()) != null) {

sb.append(line);

break;

}

in.close();

result = sb.toString();

}

catch (Exception ex)
```

```
    {
     //do nothing
    }
    return result;
    }
  @Override
   protected void onPostExecute(String s) {
    super.onPostExecute(s);
   }
}
```

REGISTRATION ACTIVITY:

```
package com.example.farmchat2;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
public class RegistrationActivity extends AppCompatActivity {
private EditText etFarmerName, etMobile, etUsername, etPassword;
 private Button btnRegister;
@Override
 protected void onCreate(Bundle savedInstanceState) {
  super.onCreate(savedInstanceState);
  setContentView(R.layout.activity_registration);
 etFarmerName = (EditText) findViewById(R.id.etFarmerName);
    etMobile = (EditText) findViewById(R.id.etMobile);
    etUsername = (EditText) findViewById(R.id.etUsername);
    etPassword = (EditText) findViewById(R.id.etPassword);
```

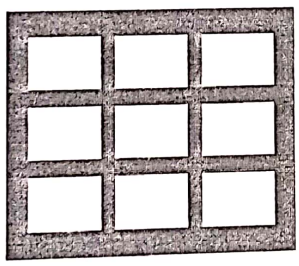
```
btnRegister = (Button) findViewById(R.id.btnRegister);
    btnRegister.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View v) {
        try {
String FarmerName = etFarmerName.getText().toString();
String Mobile = etMobile.getText().toString();
String Username = etUsername.getText().toString();
String Password = etPassword.getText().toString();
Stringresult=newRegistrationTask(RegistrationActivity.this).execute(FarmerName,Mobile,
Username, Password).get();
if (result == "account_registered")
 {
 Toast.makeText(getApplicationContext(),"Account Registered Successfully!",
Toast.LENGTH_LONG).show();
  }
  if (result == "username_not_available")
  {
 Toast.makeText(getApplicationContext(), "Username not available. Please specify different
username for login.", Toast.LENGTH_LONG).show();
  }
  }
catch (Exception ex)
  {
 Toast.makeText(getApplicationContext(),ex.getMessage().toString(),
Toast.LENGTH_LONG).show();
  }
  }
  });
  }
  }
```

ADD EQUIPMENT ACTIVITY:

```
package com.example.farmchat2;
import androidx.appcompat.app.AppCompatActivity;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Spinner;
import android.widget.Toast;
public class AddEquipmentActivity extends AppCompatActivity {
private SharedPreferences sharedPreferences;
private EditText etEquipmentName, etAmount;
   private Spinner drpCategory, drpAmountBasis;
   private Button btnAddEquipment;
@Override
   protected void onCreate(Bundle savedInstanceState) {
  super.onCreate(savedInstanceState);
  setContentView(R.layout.activity_add_equipment);
sharedPreferences=(SharedPreferences)getSharedPreferences("farmerchat",
MODE_PRIVATE);
 etEquipmentName = (EditText) findViewById(R.id.etEquipmentName);
  etAmount = (EditText) findViewById(R.id.etAmount);
  drpCategory = (Spinner) findViewById(R.id.drpCategory);
 drpAmountBasis = (Spinner) findViewById(R.id.drpAmountBasis);
btnAddEquipment = (Button) findViewById(R.id.btnAddEquipment);
btnAddEquipment.setOnClickListener(new View.OnClickListener()
 @Override
 public void onClick(View v) {
   try {
   String Username = sharedPreferences.getString("username", "null");
   String EquipmentName = etEquipmentName.getText().toString();
    String Amount = etAmount.getText().toString();
     String Category = drpCategory.getSelectedItem().toString();
     String AmountBasis = drpAmountBasis.getSelectedItem().toString();
```

```
Stringresult=newAddEquipmentTask(AddEquipmentActivity.this).execute(Username,Equip
mentName, Category, Amount, AmountBasis).get();
if (result.equals("equipment_added")) {
Toast.makeText(getApplicationContext(),"EquipmentAddedSuccessfully!",
Toast.LENGTH_LONG).show();
    }
    if (result.equals("failed")) {
 Toast.makeText(getApplicationContext(),"Unabletoaddequipment.",
Toast.LENGTH_LONG).show();
    }
    } catch (Exception ex) {
   Toast.makeText(getApplicationContext(),ex.getMessage().toString(),
Toast.LENGTH_LONG).show();
          }
       }
    });
  }
}
```

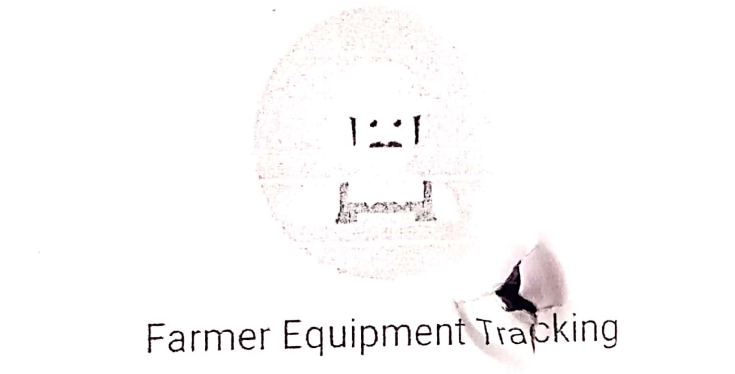
SCREENSHOTS



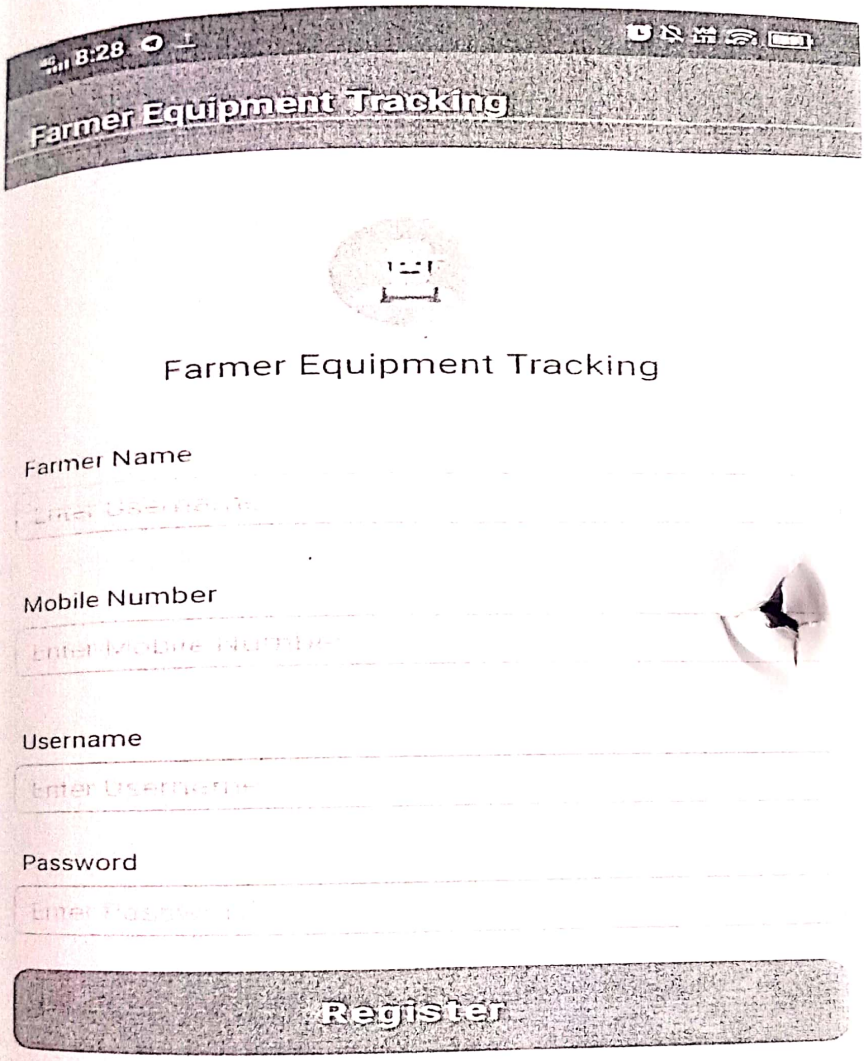
SCREENSHOTS

FARMER EQIUPMENT TRACKER:

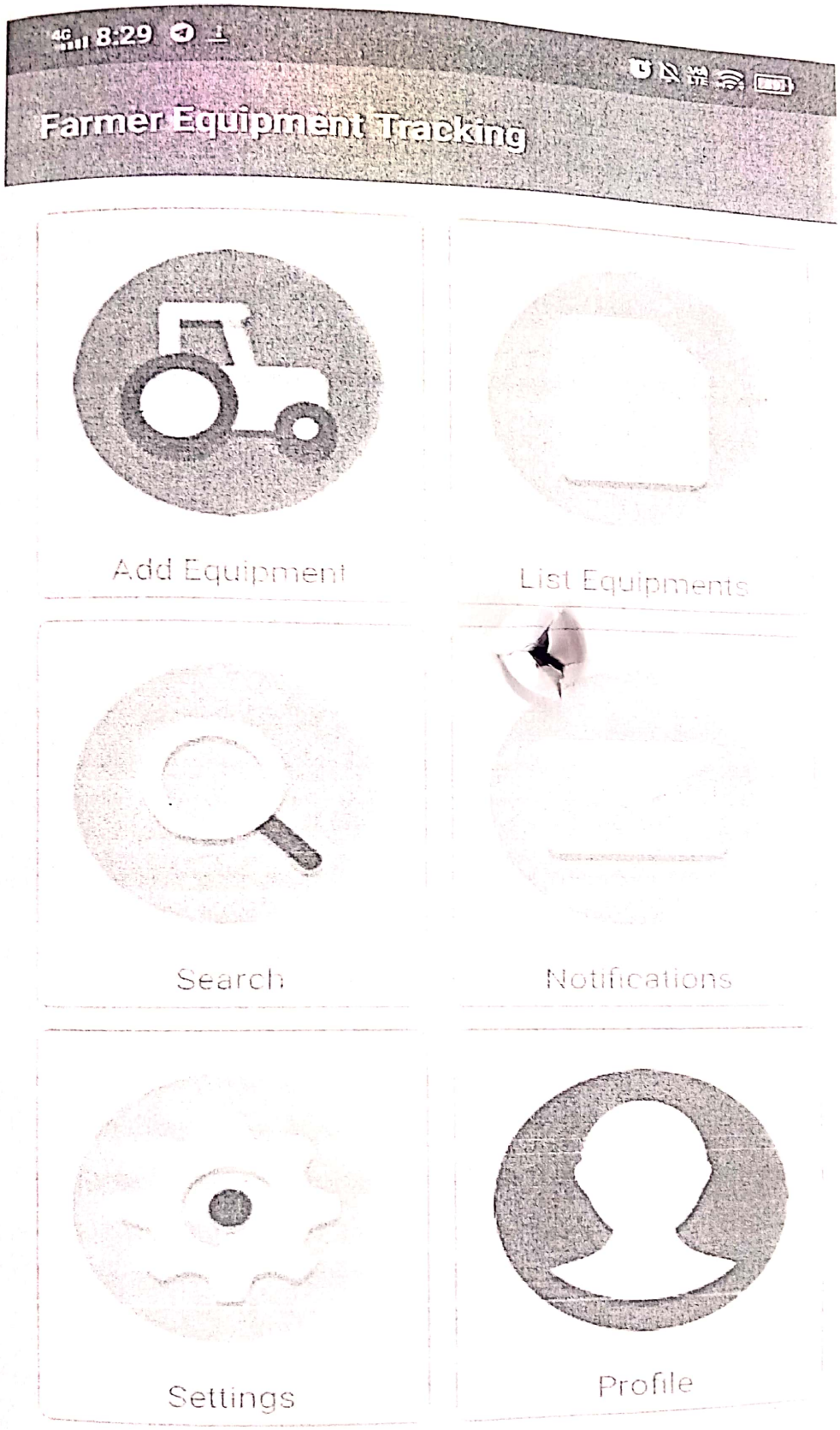
SIGNUP PAGE:



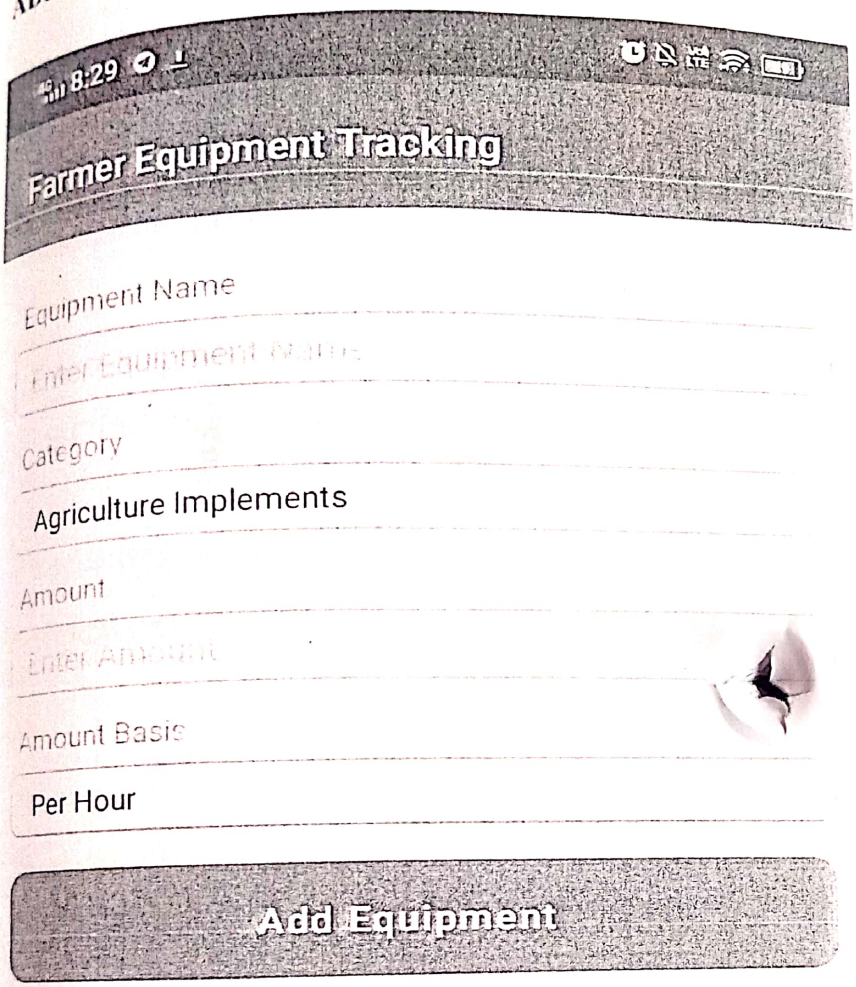
REGISTRATION PAGE:



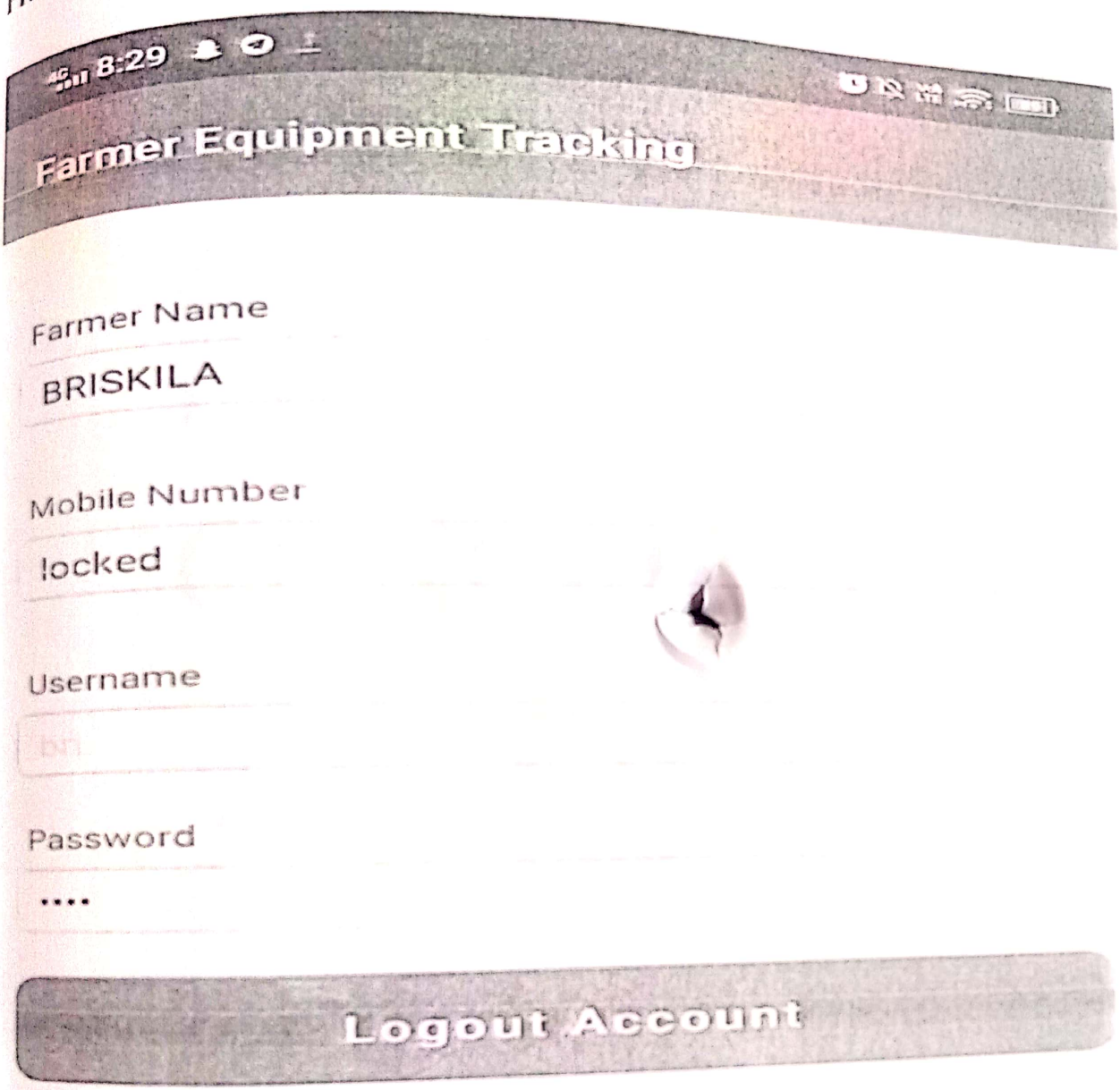
WELCOME PAGE:



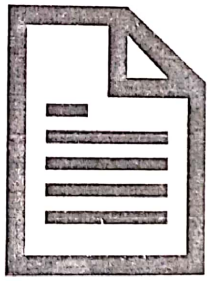
ADD EQUIPMENT PAGE:



PROFILE PAGE:



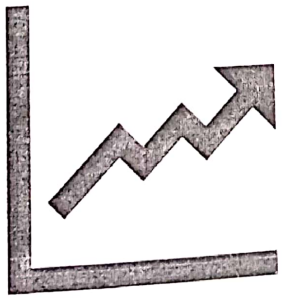
CONCLUSION



CONCLUSION

The proposed project stands different from the existing system as it's not only the GPS value it makes use of but it works on GSM services which makes application a simple & unique one. This project explains all the details of development process for the Location tracking of an farming equipments using GPS Location software system. The main feature of the proposed system is to provide location tracking functionalities to Android devices using GPS. This application locates device by making device ring and get latitude and longitude of an Android device.

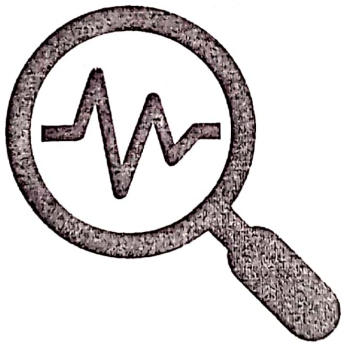
FUTURE ENHANCEMENT



FUTURE ENHANCEMENT

- In future a feature can be added to this application that will allow the farmers to search and live locate for farming equipments.
- Tamil name product will be added

BIBLIOGRAPHY



BIBLIOGRAPHY

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- Android Cookbook by Ian Darwin
- Android App Development For Dummies by Michael Burton
- Android Studio Development Essentials by Neil Smith
- PHP: THE COMPLETE REFERENCE by Steven Holzner
- Learning MySQL by Seyed M. M. Tahaghoghi

WEBSITE REFERRED

- https://www.javatpoint.com/android-tutorial
- https://stackoverflow.com/
- https://www.tutorialspoint.com/android/index.htm
- https://developer.android.com/training/basics/firstapp

PATIENT CARE PLAN

A project submitted to

ST. MARY'S COLLEGE (Autonomous), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

In partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

N.Iswarya Lakshmi

Reg. No.: 20SPCS06

Under the Supervision and Guidance of

Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET.,

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi-628001

MAY- 2022

CERTIFICATE

This is to certify that this project work entitled as "**PATIENT CARE PLAN"** is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to **Manonmaniam Sundaranar University, Tirunelveli,** in partial fulfillment for the award of the degree of Master of Science in **Computer Science** for the work done during the year 2021-2022 by **N.ISWARYA LAKSHMI (Reg. No.:20SPCS06)**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do here by declare that, the project entitled "**PATIENT CARE PLAN"** submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET.,** Assistant Professor, PG Department of Computer Science (SSC), St.Mary's College (Autonomous), Thoothukudi**.**

Station: Thoothukudi

Date: **Signature of the student**

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength to finish our project successfully.

My sincere thanks to **Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Joshpine Jeyarani, Director of SSC**, St. Mary's College(Autonomous), Thoothukudi, for giving permission to work on this project.

I express my hearty thanks to my guide **Ms. C. Nayanthra Mascarenhas M.Sc., MPhil., SET.,** Assistant professor and Coordinator, PG Department of computer science (SSC) for her valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to **Ms. A. Jenitta Jebamalar M.Sc (IT), M.Sc (CS), M.Phil., B.Ed.,** Assistant Professor, PG Department of computer science(SSC) and **Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D.,** Assistant Professor, PG Department of Computer Science(SSC), for her encouragement and support.

I am much indebted to **Mr. Saravanan Chandra Krishnan CEO, Tekspear Soft** for his untiring effort, immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

TEK SPEAR
SOLUTIONS MADE SIMPLE

111/1c/1, [illegible], Tuticorin-628002

17-05-2022

To

The Head of the Department

PG Department of Computer Science (SSC)

St. Mary's College (Autonomous)

Thoothukudi

Dear Madam,

Sub : Project Completion Certificate-Reg

On behalf of **TEKSPEAR SOLUTIONS,** We are pleasure to inform you that **Ms. N. Iswarya Lakshmi, REG No. 20SPCS06** studying M.sc Computer Science Final year has been done the project work at our concern On **"Patient Care Plan"** during the period from **Feburary 2022** to **May 2022**.

During this period, we noticed her to be diligent, sincere and hardworking and she accomplished her within stipulated deadline.

We wish her for all future endeavors.

TEKSPEAR SOLUTIONS
PROJECT DIRECTOR

(C.SARAVANAN) H.R

ABSTRACT

ABSTRACT

‘Patient Care Plan’ is a module in Remote Cares project used to create care plans for the patients who are in need. Care Plan includes the documentation of patient’s health. This includes the medical records, medications, allergies and list of providers etc. The main purpose of care plan is to help patients with chronic conditions and the primary goals of care plan are to assist patients with accessing needed health services and coordinating care. This module consists of menu named CCM Summary. The CCM Summary includes list of CCM enrolled patients. We can create care plan for those patients. This includes various tabs such as Goals, action plans, medications, problems and care team. We have to create Goals and Action Plans type in RCS Admin application. Goals tab allows to create the primary problems and in order to cure that, various medication plans are created and these plans are managed by the care team. Thus, the care plan allows personalized attention through coordinated care.

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7.	FORM DESIGN	
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INTRODUCTION

INTRODUCTION

Intelligent Healthcare Delivered from the Cloud

The patient care journey is traditionally a fragmented one, especially for more complex cases or chronic conditions that involve multiple healthcare providers and clinical specialists. As a result, a patient's critical health data may be stored and siloed across disparate IT systems or in outdated pen-and-paper systems.

RemoteCares was founded to solve this challenge. RemoteCares is transforming the healthcare space with its unified platform for health management, which collects and consolidates data from clinical management systems, medical devices, and patients in real time into a single view and protects it with modern encryption standards. It also provides intelligent healthcare, with built-in risk stratification tools, care plan templates, continuous monitoring of vitals, smart algorithms, and data analytics.

Real-Time Remote Consultation with Telehealth

One of the headline features of RemoteCares is its telehealth platform, a highly popular video-conferencing solution that connects healthcare providers with patients to offer remote consultations—whether in one-on-one sessions or in conferences of up to 100 people.

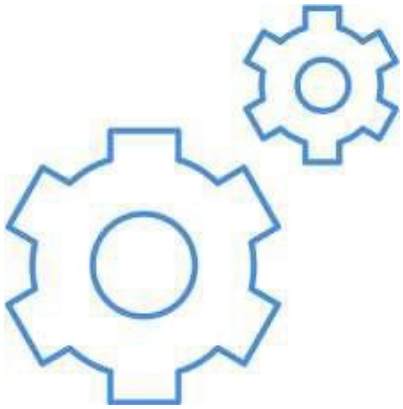
Preventive services

Preventive care is care you receive to prevent illness, detect medical conditions, and keep you healthy. Medicare Part B covers many preventive services, such as screenings, vaccines, and counseling. RemoteCare's intuitive platform is a one-stop wellness program built to help practices get compliant, patients get the most out of proactive care, and practitioners get time back in their days to focus on connecting and providing excellent care. It's HIPAA compliant and covers more facets of Medicare preventive care than any other platform.

Our most popular software solutions allow practices to effectively manage these Medicare programs in their office with their staff. We'll provide the tools and training. You provide the clinical resources. Medicare Programs supported through our platform include:

- Chronic Care Management
- Remote Patient Monitoring
- Annual Wellness Visits

SYSTEM SPECIFICATIONS



SYSTEM SPECIFICATIONS

HARDWARE REQUIREMENTS

Front-end Tools	:	Visual Studio 2019
Back-end Tools	:	Microsoft SQL Server Management Studio
Web API	:	Rest API
Platform	:	Windows

SOFTWARE REQUIREMENTS

Operating System	:	Windows 10
Application Front-end Tools	:	UI
Database Back-end Tools	:	Entity Framework Core

INSTALLATION PROCEDURE

Step 1 - Make sure your computer is ready for Visual Studio

Before you begin installing Visual Studio:

1. Check the system requirements. These requirements help you know whether your computer supports Visual Studio 2019.
2. Apply the latest Windows updates. These updates ensure that your computer has both the latest security updates and the required system components for Visual Studio.
3. Reboot. The reboot ensures that any pending installs or updates don't hinder your Visual Studio install.
4. Free up space. Remove unneeded files and applications from your system drive by, for example, running the Disk Cleanup app.

Step 2 - Download Visual Studio

Next, download the Visual Studio bootstrapper file.

To do so, choose the following button, choose the edition of Visual Studio that you want, choose **Save**, and then choose **Open folder**.

Step 3 - Install the Visual Studio Installer

Run the bootstrapper file to install the Visual Studio Installer. This new lightweight installer includes everything you need to both install and customize Visual Studio.

1. From your **Downloads** folder, double-click the bootstrapper that matches or is similar to one of the following files:
    - **vs_community.exe** for Visual Studio Community
    - **vs_professional.exe** for Visual Studio Professional
    - **vs_enterprise.exe** for Visual Studio Enterprise

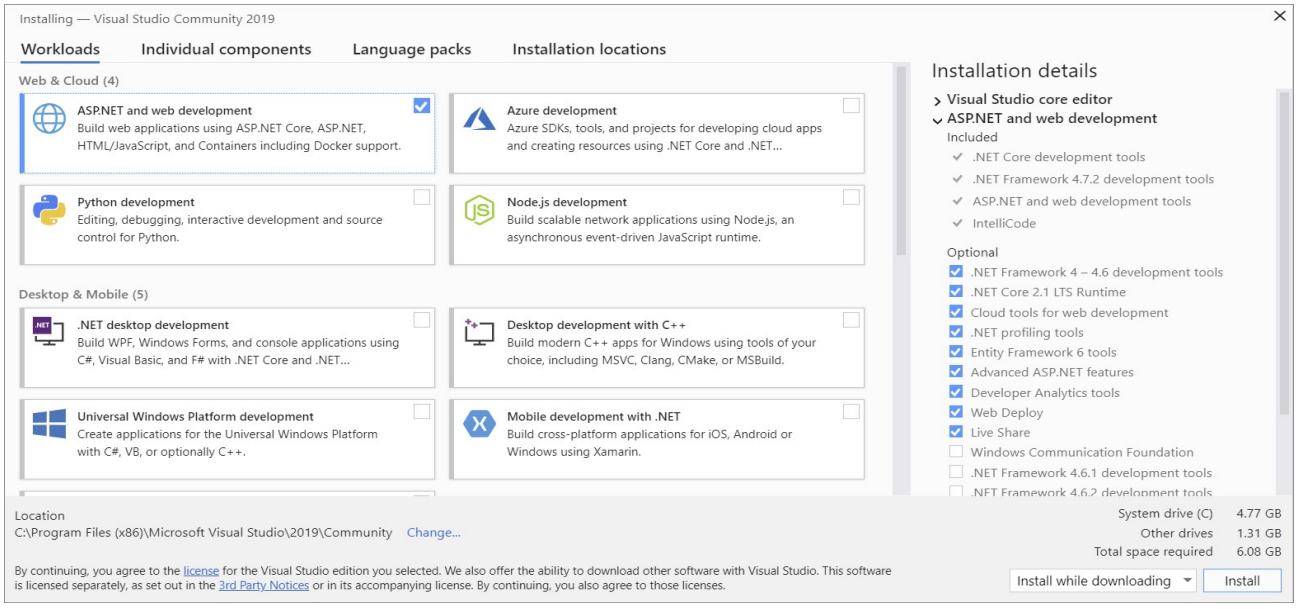
    If you receive a User Account Control notice, choose **Yes**.

2. We'll ask you to acknowledge the Microsoft License Terms and the Microsoft Privacy Statement. Choose **Continue**.

Step 4 - Choose workloads

After the installer is installed, you can use it to customize your installation by selecting the feature sets—or workloads—that you want. Here's how.

1. Find the workload you want in the **Visual Studio Installer**.



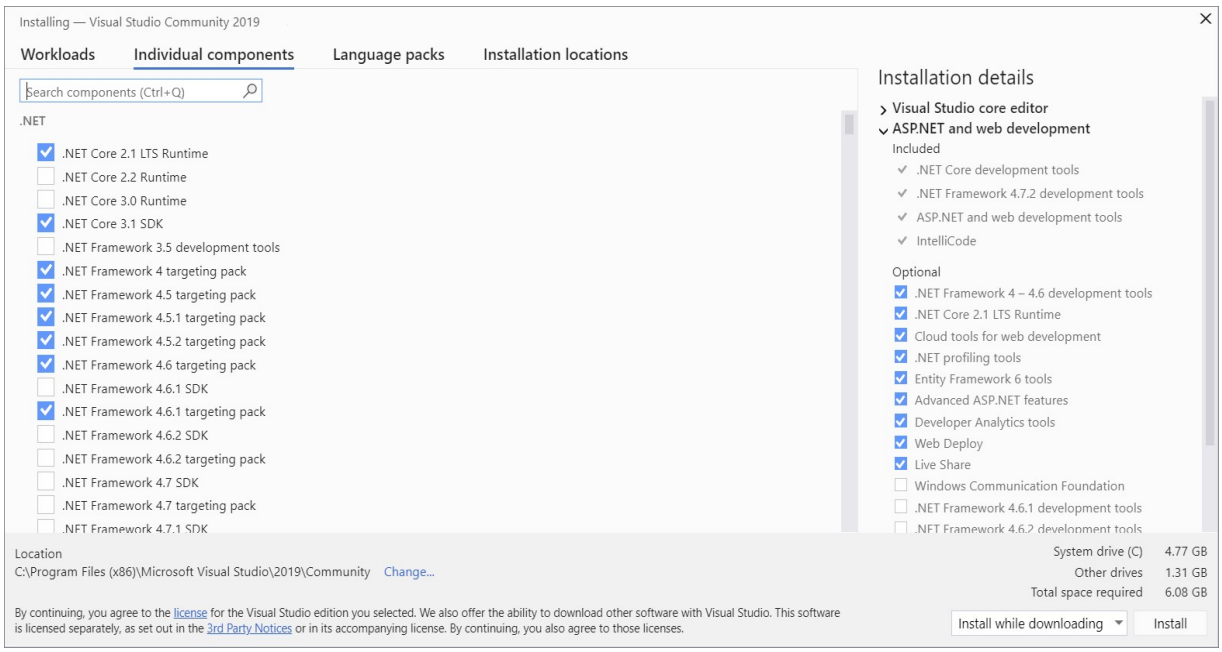
For example, choose the "ASP.NET and web development" workload. It comes with the default core editor, which includes basic code editing support for over 20 languages, the ability to open and edit code from any folder without requiring a project, and integrated source code control.

2. After you choose the workload(s) you want, choose **Install**.

Next, status screens appear that show the progress of your Visual Studio installation.

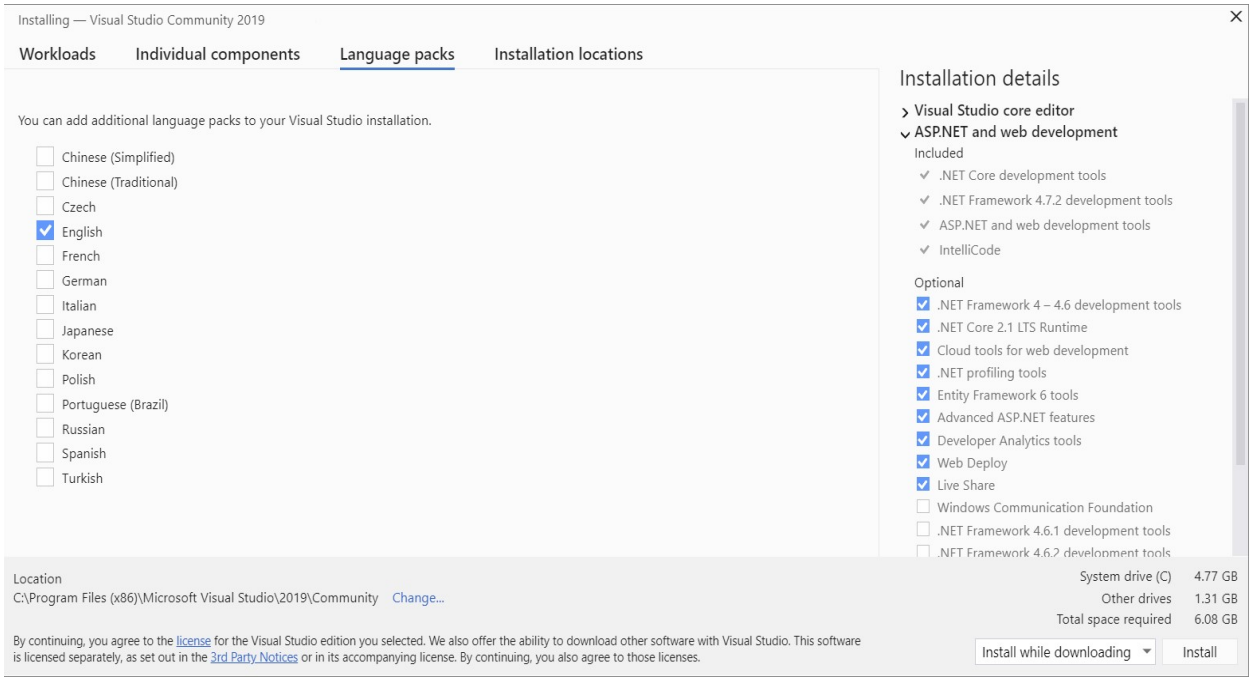
Step 5 - Choose individual components

If you don't want to use the Workloads feature to customize your Visual Studio installation, or you want to add more components than a workload installs, you can do so by installing or adding individual components from the **Individual components** tab. Choose what you want, and then follow the prompts.



Step 6 - Install language packs

By default, the installer program tries to match the language of the operating system when it runs for the first time. To install Visual Studio in a language of your choosing, choose the **Language packs** tab from the Visual Studio Installer, and then follow the prompts.

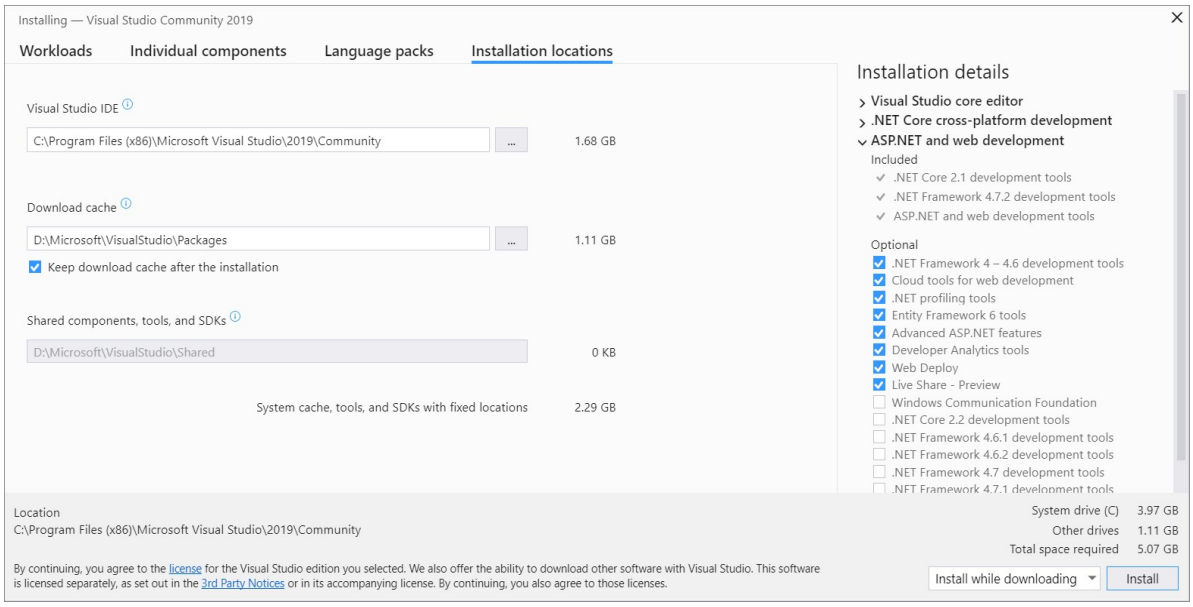


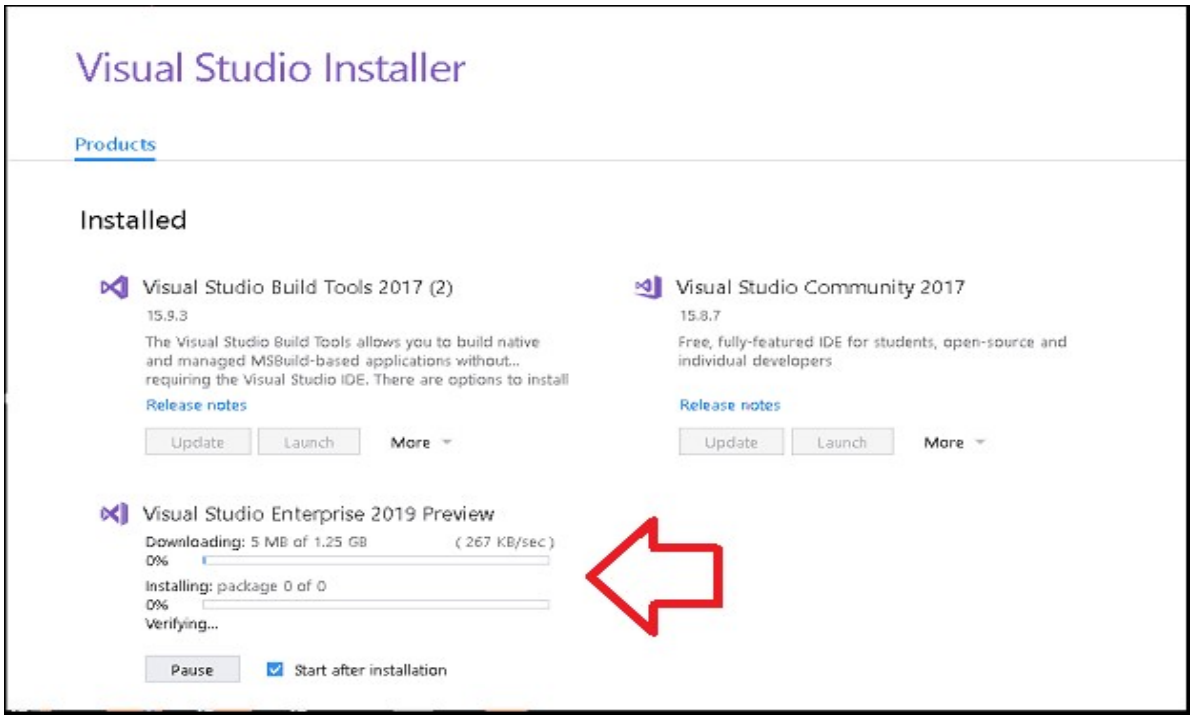
Change the installer language from the command line

Another way that you can change the default language is by running the installer from the command line. For example, you can force the installer to run in English by using the following command: `vs_installer.exe --locale en-US`. The installer will remember this setting when it is run the next time. The installer supports the following language tokens: zh-cn, zh-tw, cs-cz, en-us, es-es, fr-fr, de-de, it-it, ja-jp, ko-kr, pl-pl, pt-br, ru-ru, and tr-tr.

Step 7 - Select the installation location

You can reduce the installation footprint of Visual Studio on your system drive. You can choose to move the download cache, shared components, SDKs, and tools to different drives, and keep Visual Studio on the drive that runs it the fastest.





Step 8 - Start developing

1. After Visual Studio installation is complete, select the **Launch** button to get started developing with Visual Studio.
2. On the start window, choose **Create a new project**.
3. In the search box, enter the type of app you want to create to see a list of available templates. The list of templates depends on the workloads that you chose during installation. To see different templates, choose different workloads.

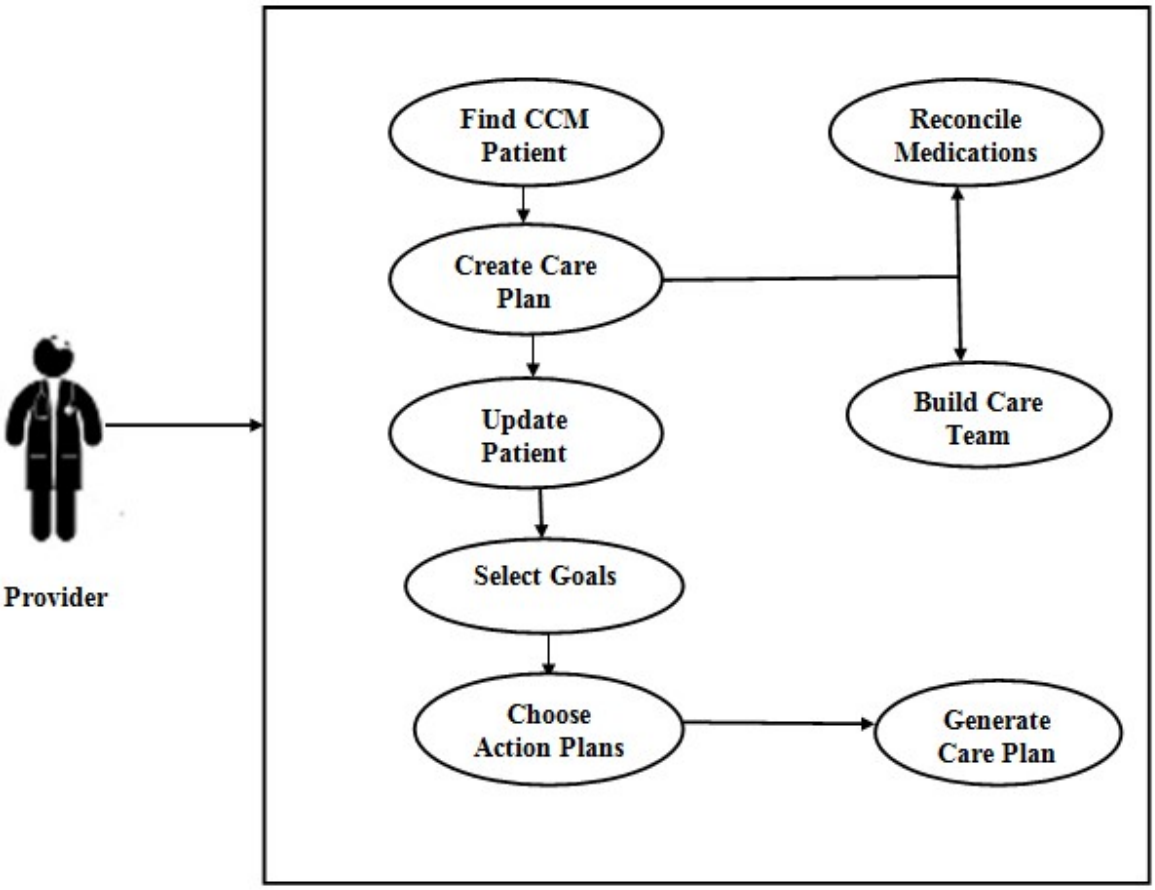
   You can also filter your search for a specific programming language by using the **Language** drop-down list. You can filter by using the **Platform** list and the **Project type** list, too.

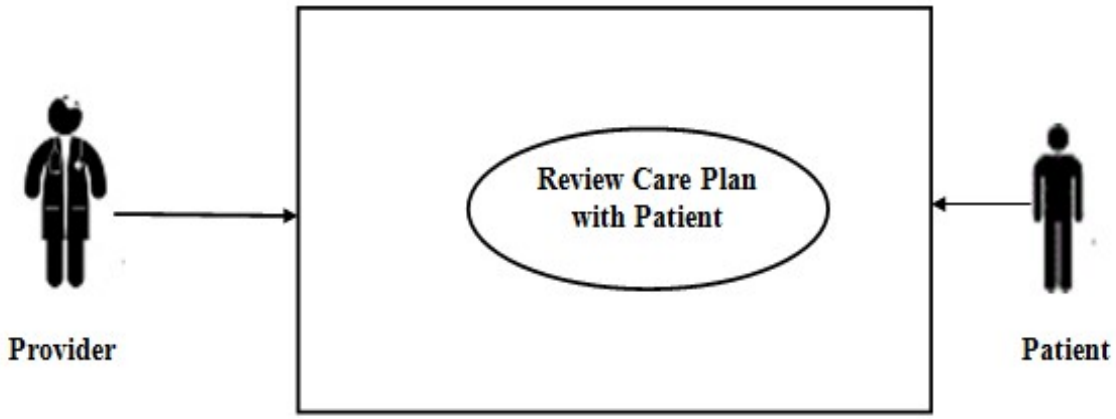
4. Visual Studio opens your new project, and you're ready to code!

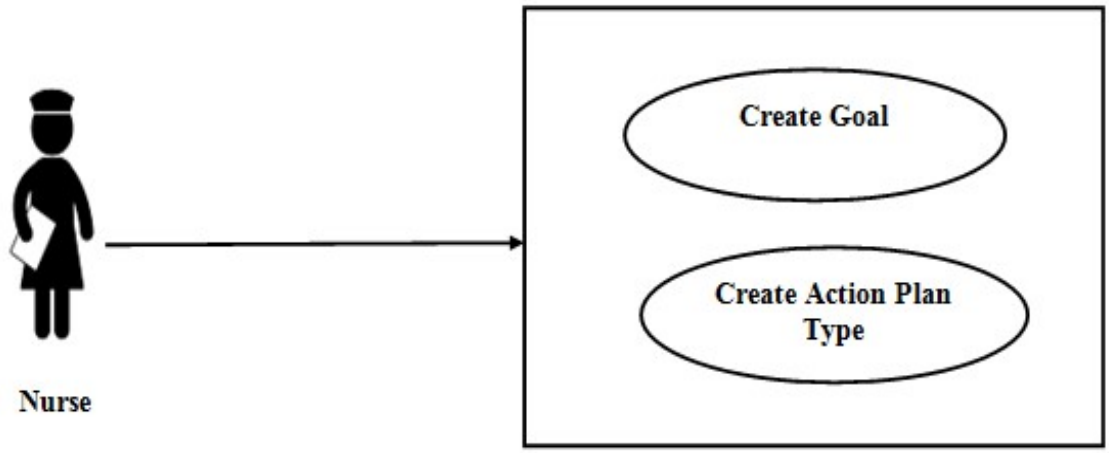
SYSTEM DESIGN

SYSTEM DESIGN

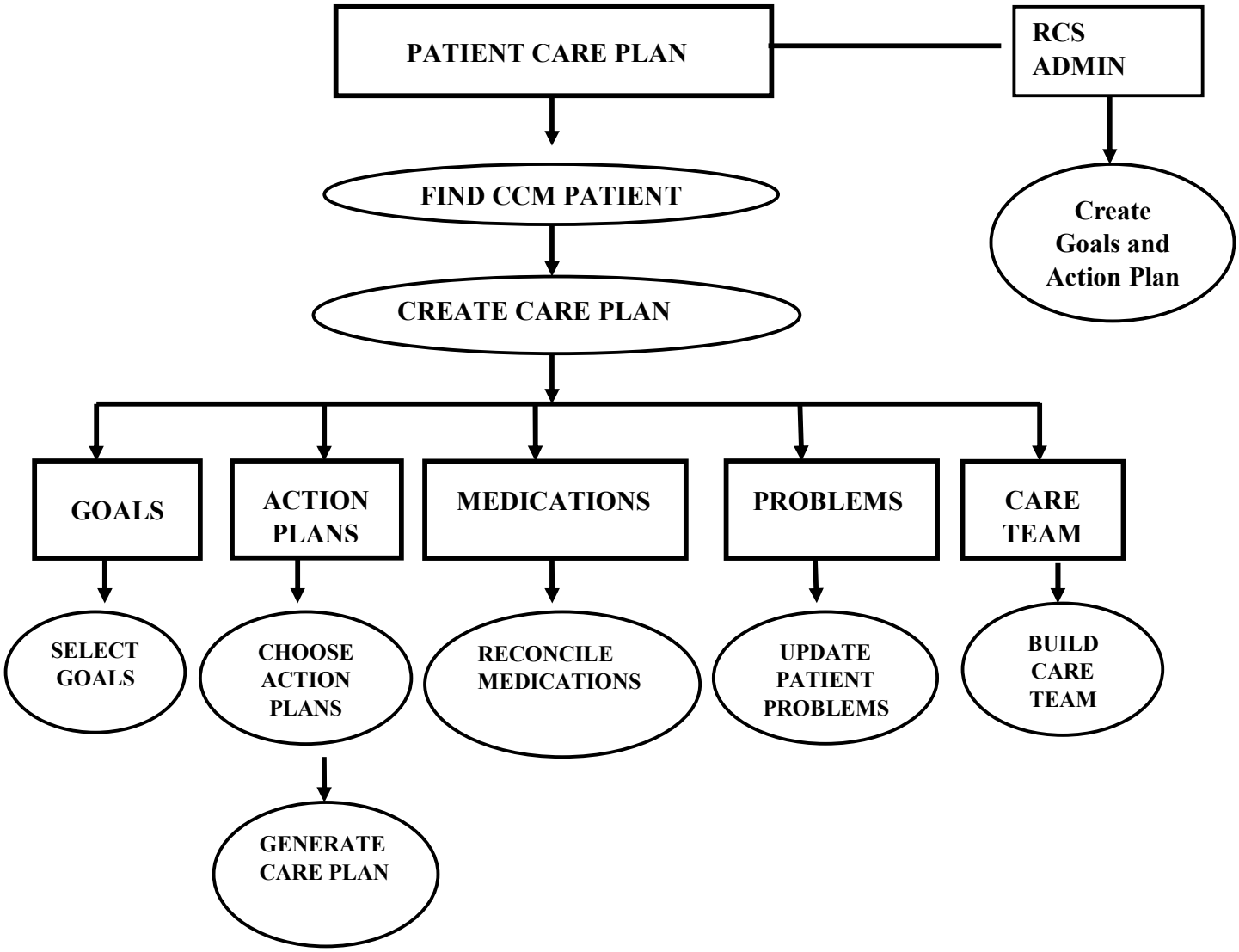
USE CASE DIAGRAM:



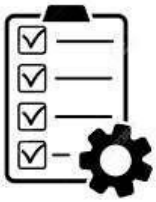

Review Care Plan
with Patient
Provider
Patient


Create Goal
Create Action Plan
Type
Nurse

ENITTLED RELATIONSHIP DIAGRAM



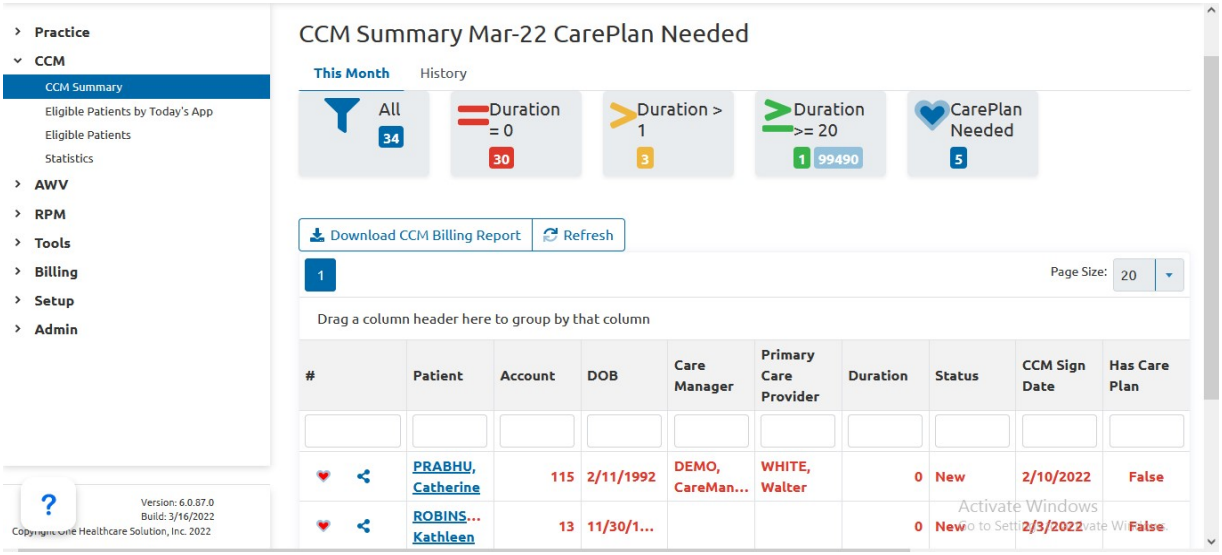
PROJECT DESCRIPTION



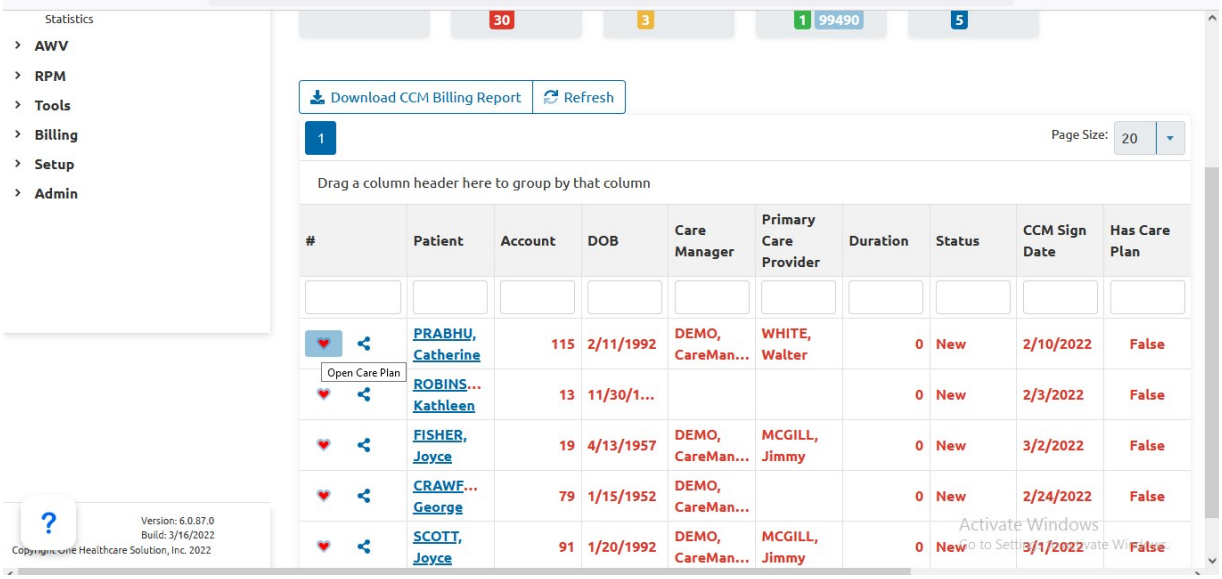
PROJECT DESCRIPTION:

PATIENT CARE PLAN:

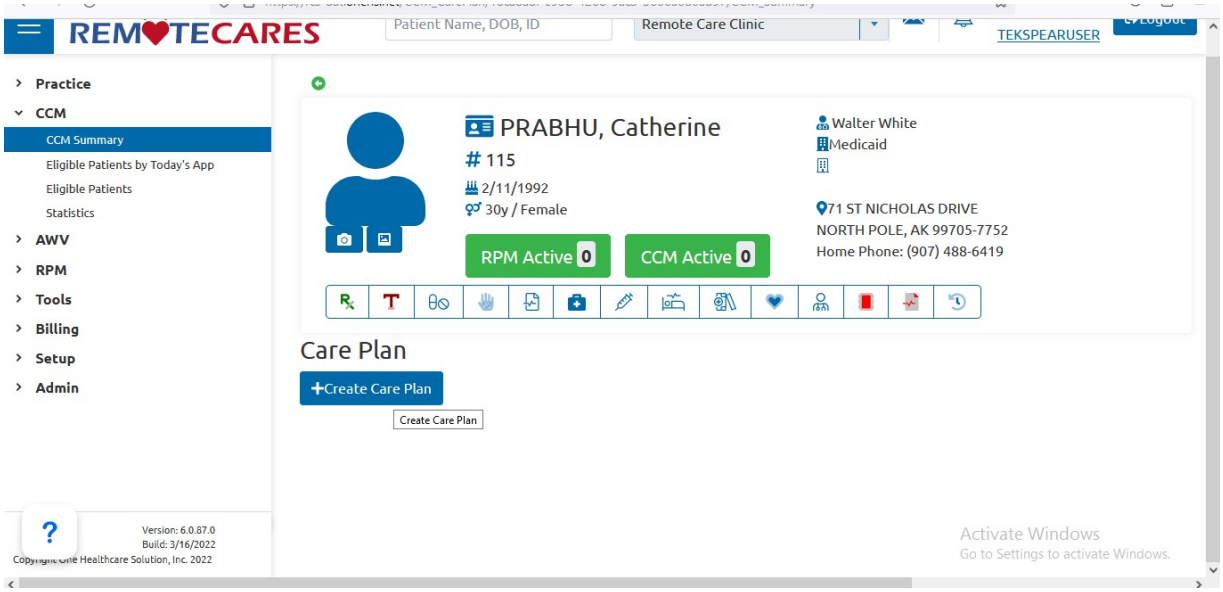
"CCM Summary" link in the navigation menu. Then click the care plan for patient



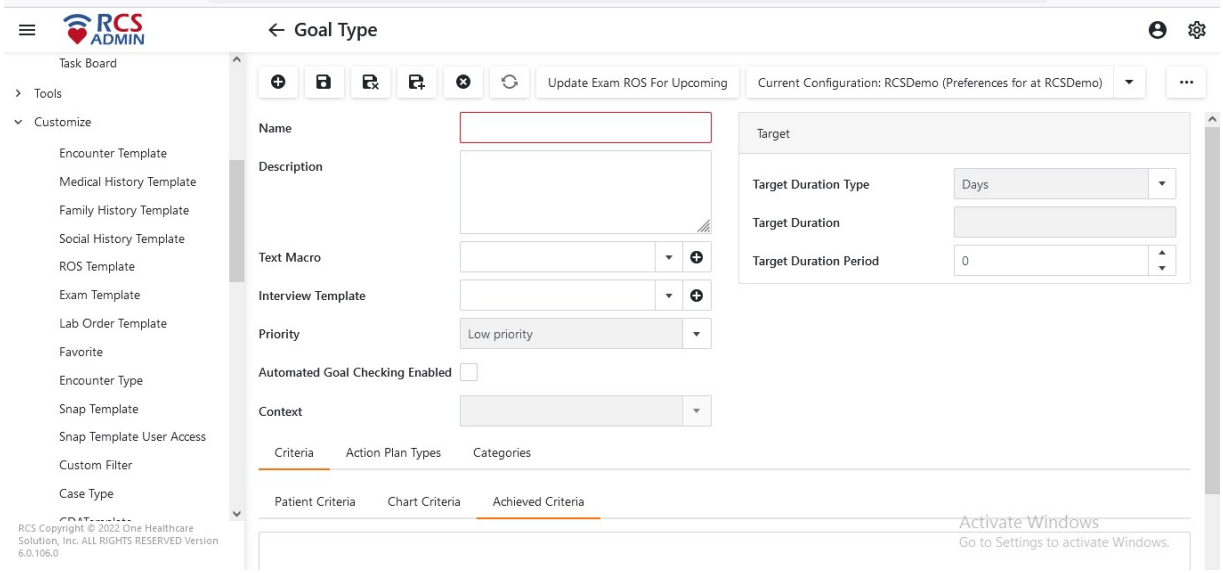
Open the care plan for patients who are care plan needed



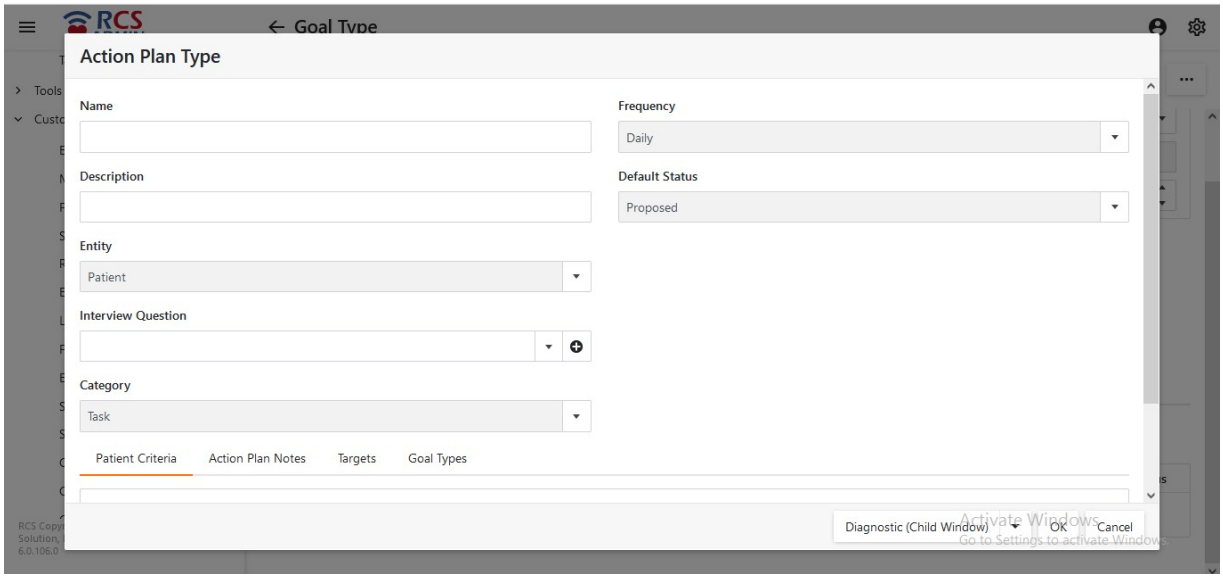
To create a care plan, users will find the blue button at the upper right of the **"CCM Summary"**.



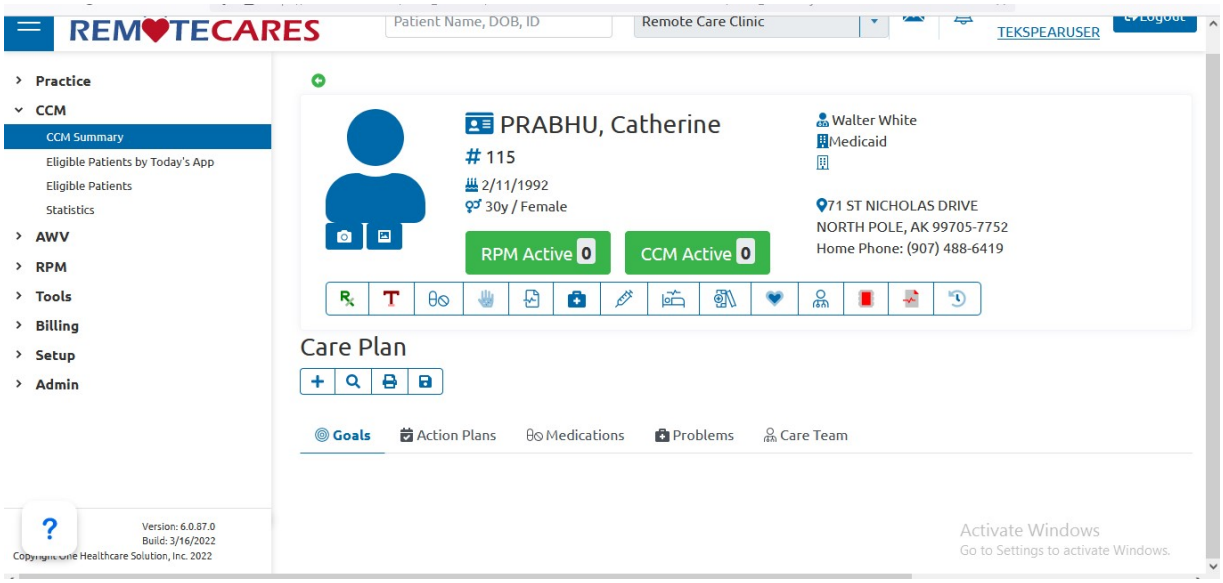
We have to create new goal type for care plan



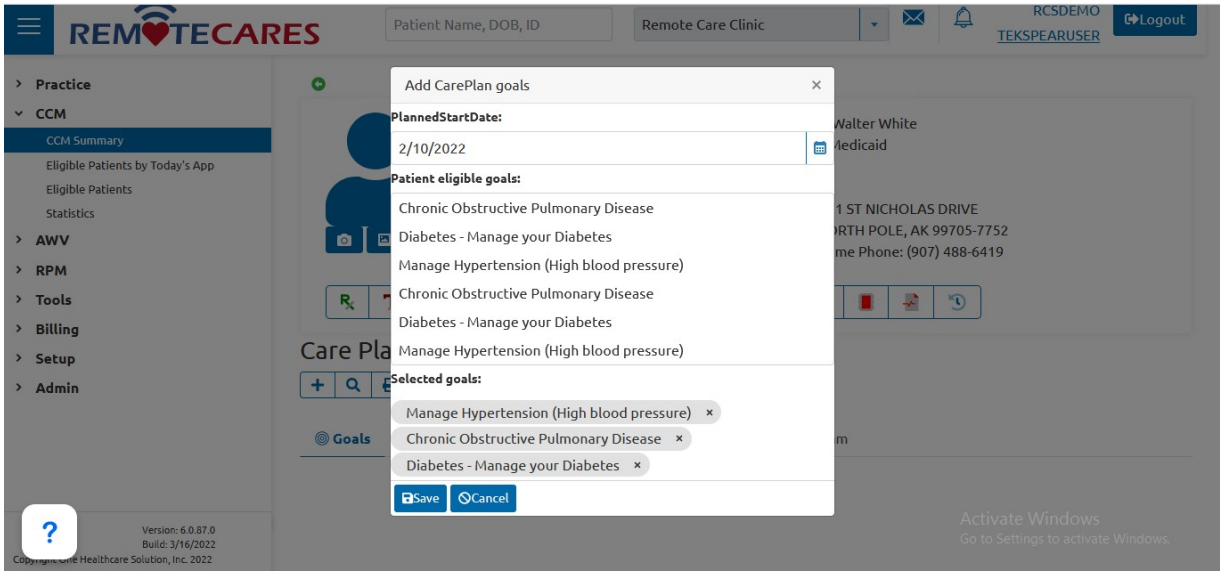
We have to create new Action Plan Type for care plan



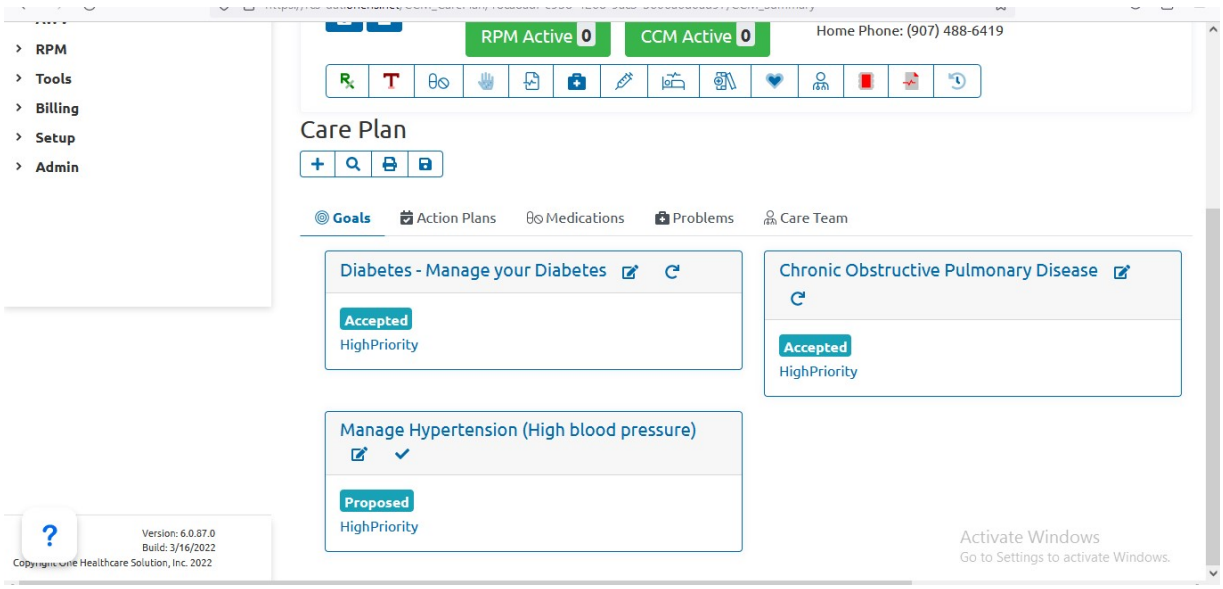
Create Care plan- five tabs (Goals, Action Plans, Medications, Problems, Care Team)



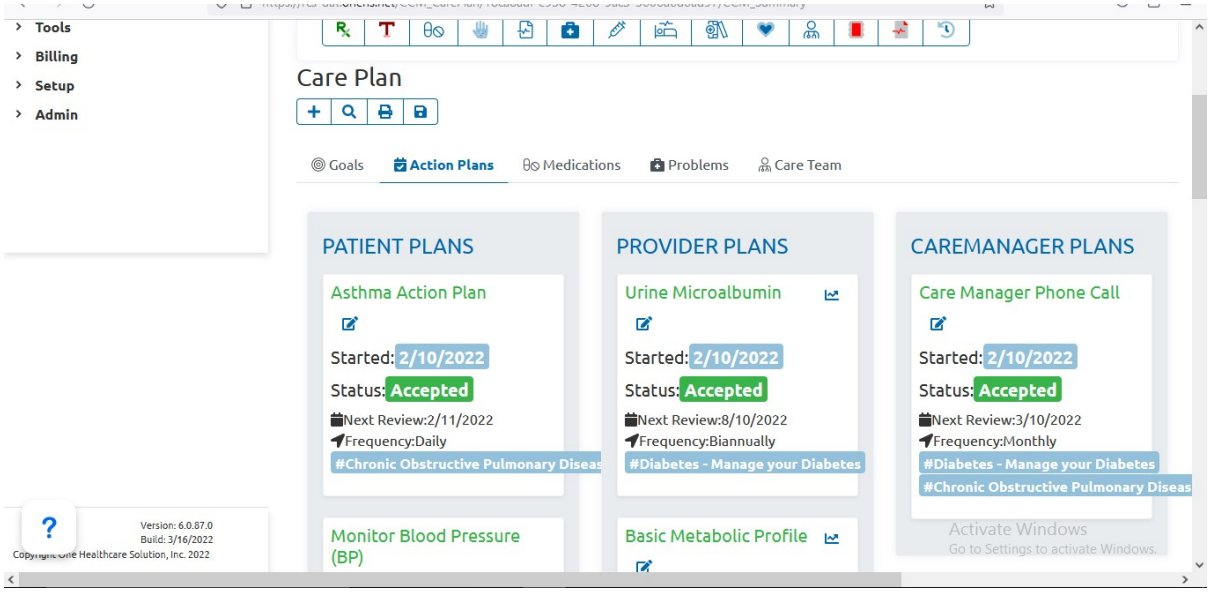
Click **“Goals”** tab for select patient eligible goals then click “**Save”** button



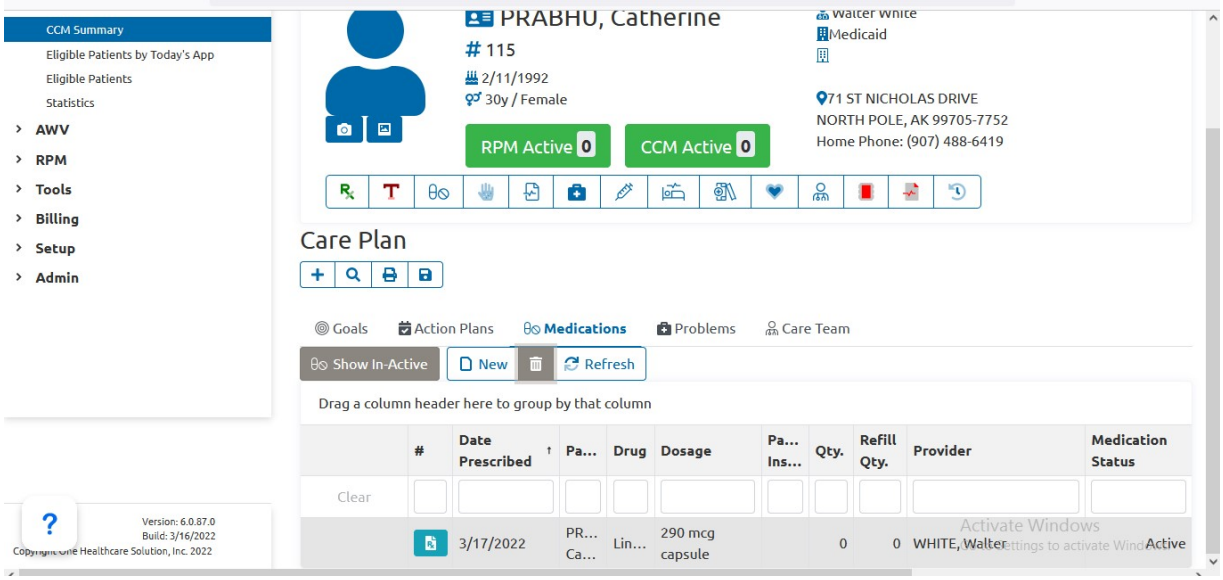
After selecting the goals of the patient in selected goals text box, the goals of the patient will be displayed in the Care Plan page.



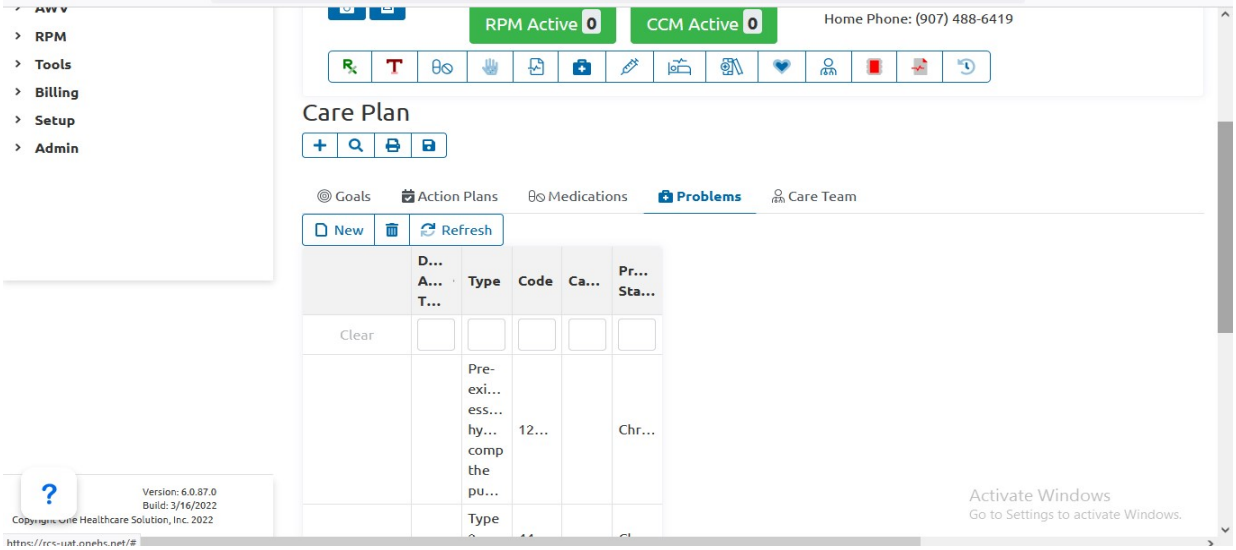
"**Action plans**", tab patients set a goal for behavior that they wish to change, and coaches engage patients in a discussion of an action plan that can help the patient fulfill the goal.



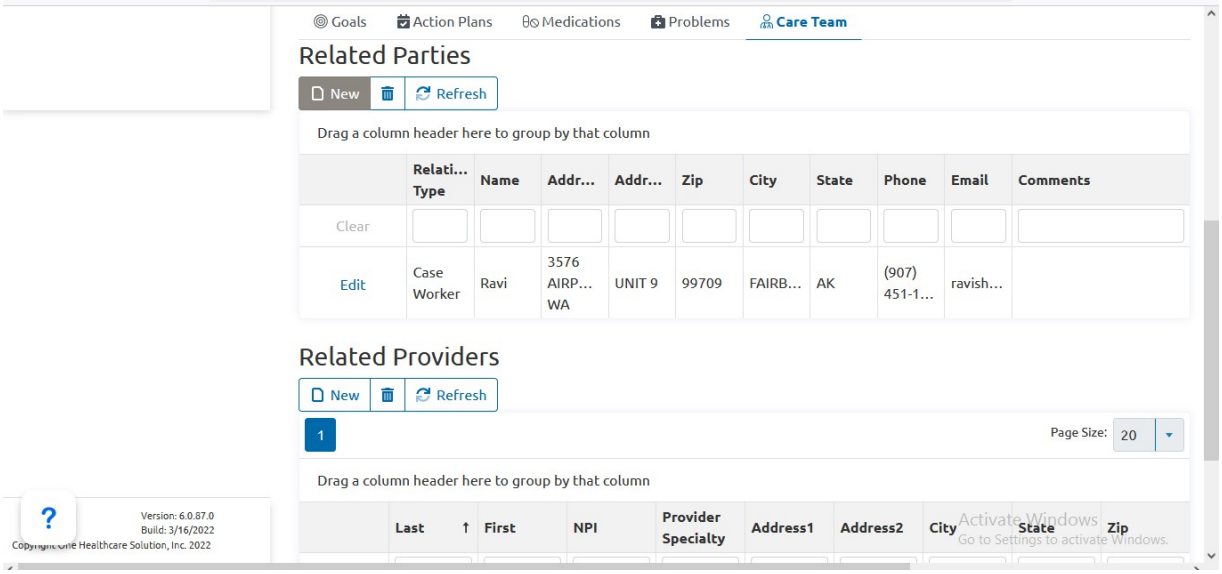
"**Medication"** tab resolve drug-related and other issues, and to help patients set and help achieve healthcare goals.



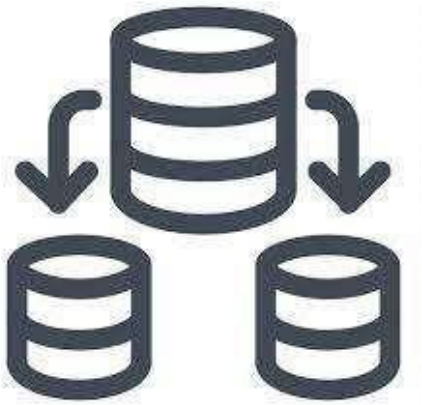
“Problems” tab for patient problem code, type, problem status



Click the “**Care team”** tab for patient related parties and related providers



DATABASE DESCRIPTION



DATABASE DESCRIPTION

Care Plan Health Concern Table:

ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Created	datetime	Checked
CreatedBy	uniqueidentifier	Checked
LastModified	datetime	Checked
ModifiedBy	uniqueidentifier	Checked
IsSynchronized	bit	Checked
IsArchived	bit	Checked
ObjectId	uniqueidentifier	Checked
ObjectType	nvarchar(100)	Checked
Property	nvarchar(100)	Checked
Value	nvarchar(200)	Checked
Sequence	int	Checked
OptimisticLockField	int	Checked
GCRecord	int	Checked
CarePlan	uniqueidentifier	Checked

Care Plan Table:

ColumnName	DataType	AllowNull
Oid	Uniqueidentifier	Unchecked
Text	nvarchar(MAX)	Checked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
PlannedStartDate	Datetime	Checked
CareplanStatus	Int	Checked

Goal Table:

ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
CarePlan	uniqueidentifier	Checked
Type	uniqueidentifier	Checked
Priority	Int	Checked
TargetStart	datetime	Checked
TargetCompletion	datetime	Checked
ActualCompletion	datetime	Checked
Category	uniqueidentifier	Checked
GoalStatus	Int	Checked
Text	nvarchar(MAX)	Checked

Medication Table:

ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
Category	uniqueidentifier	Checked
Drug	uniqueidentifier	Checked
Name	nvarchar(500)	Checked
MedicationStatus	int	Checked
Source	int	Checked
MedicalHistory	uniqueidentifier	Checked
InfoProvidedToPatient	bit	Checked
Started	datetime	Checked
Stopped	datetime	Checked
PrescriptionStatus	int	Checked
NoteToPharmacy	nvarchar(210)	Checked
RefillsAsNeeded	bit	Checked
RefillQuantity	numeric(5, 0)	Checked
GenericsOK	bit	Checked
FormularyChecked	bit	Checked
WrittenDate	datetime	Checked
Pharmacy	uniqueidentifier	Checked
Quantity	nvarchar(16)	Checked
LastFilled	datetime	Checked
Frequency	uniqueidentifier	Checked
Dispense	nvarchar(16)	Checked
DispenseUnit	nvarchar(100)	Checked
DaysSupply	numeric(5, 0)	Checked

PatientInstructions	nvarchar(400)	Checked
PharmacyNotes	nvarchar(210)	Checked
PrescibedBy	uniqueidentifier	Checked
DoseSpotID	int	Checked
SureScriptsMessageId	nvarchar(100)	Checked
SubstitutionsOK	bit	Checked
QuantityInt	numeric(10, 0)	Checked
[Order]	uniqueidentifier	Checked
ScriptSureID	numeric(10, 0)	Checked

Problem Table:

ColumnName	**DataType**	**AllowNull**
Oid	uniqueidentifier	Unchecked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
ParentChartItem	uniqueidentifier	Checked
Type	uniqueidentifier	Checked
Source	nvarchar(100)	Checked
Category	uniqueidentifier	Checked
MedicalHistory	uniqueidentifier	Checked
ProblemStatus	int	Checked

Related Party Table:

ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Created	datetime	Checked
CreatedBy	uniqueidentifier	Checked
LastModified	datetime	Checked
ModifiedBy	uniqueidentifier	Checked
IsSynchronized	bit	Checked
IsArchived	bit	Checked
IsProvider	bit	Checked
RelatedProvider	uniqueidentifier	Checked
RelationType	uniqueidentifier	Checked
[Case]	uniqueidentifier	Checked
OptimisticLockField	int	Checked
GCRecord	int	Checked
ObjectType	int	Checked
Provider	uniqueidentifier	Checked
Patient	uniqueidentifier	Checked
ThirdParty	uniqueidentifier	Checked

Related Provider Table:

ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Signature	varbinary(MAX)	Checked
Resource	uniqueidentifier	Checked
BillingResourceID	nvarchar(100)	Checked
EPrescribePIN	nvarchar(100)	Checked
ProcessMetrics	bit	Checked
ClearPathId	int	Checked
IsActive	bit	Checked
StartedPhase1	datetime	Checked
StartedPhase2	datetime	Checked
StartedPhase3	datetime	Checked
Created	datetime	Checked
CreatedBy	uniqueidentifier	Checked
LastModified	datetime	Checked
ModifiedBy	uniqueidentifier	Checked
IsSynchronized	bit	Checked
IsArchived	bit	Checked
ProviderInfo	uniqueidentifier	Checked
[User]	uniqueidentifier	Checked
DEANumber	nvarchar(100)	Checked
DPS	nvarchar(100)	Checked
FileID	nvarchar(100)	Checked
DentistLicenseNumber	nvarchar(100)	Checked
MedicaidNumber	nvarchar(100)	Checked
MedicareNumber	nvarchar(100)	Checked
NPI	nvarchar(100)	Checked
PPONumber	nvarchar(100)	Checked

PriorAuthorization	nvarchar(100)	Checked
UPIN	nvarchar(100)	Checked
MutuallyDefined	nvarchar(100)	Checked
Specialty	uniqueidentifier	Checked
TaxID	nvarchar(100)	Checked
UserName	nvarchar(100)	Checked
IsLoginActive	bit	Checked
BillingID	nvarchar(100)	Checked
SSN	nvarchar(100)	Checked
Title	nvarchar(100)	Checked
First	nvarchar(100)	Checked
Last	nvarchar(100)	Checked
MiddleInitial	nvarchar(100)	Checked
PreferredName	nvarchar(100)	Checked
Suffix	nvarchar(100)	Checked
Degree	nvarchar(100)	Checked
PreferredPhoneNum	nvarchar(100)	Checked
HomePhone	nvarchar(100)	Checked
WorkPhone	nvarchar(100)	Checked
MobilePhone	nvarchar(100)	Checked
Pager	nvarchar(100)	Checked
Fax	nvarchar(100)	Checked
Email	nvarchar(100)	Checked
Email2	nvarchar(100)	Checked
Address1	nvarchar(100)	Checked
Address2	nvarchar(100)	Checked
City	nvarchar(100)	Checked
State	nvarchar(100)	Checked
Zip	nvarchar(100)	Checked
Gender	int	Checked

DirectUserOrGroupAddress	nvarchar(100)	Checked
Middle	nvarchar(100)	Checked
OptimisticLockField	int	Checked
GCRecord	int	Checked
Location	uniqueidentifier	Checked
NightPhone	uniqueidentifier	Checked
ChangePasswordOnFirstLogon	bit	Checked
ProcessRPMMedicaidBilling	bit	Checked

Action Plan Table:

ColumnName	**DataType**	**AllowNull**
Oid	uniqueidentifier	Unchecked
Created	datetime	Checked
CreatedBy	uniqueidentifier	Checked
LastModified	datetime	Checked
ModifiedBy	uniqueidentifier	Checked
IsSynchronized	bit	Checked
IsArchived	bit	Checked
Frequency	int	Checked
Start	datetime	Checked
NextReview	datetime	Checked
ProgressNote	nvarchar(MAX)	Checked
Type	uniqueidentifier	Checked
OptimisticLockField	int	Checked
GCRecord	int	Checked
PatientInstructions	nvarchar(MAX)	Checked
TargetMeasure	uniqueidentifier	Checked
TargetRangeStart	nvarchar(50)	Checked
TargetRangeEnd	nvarchar(50)	Checked

Status	int	Checked
CarePlan	uniqueidentifier	Checked

Action Plan Type Table:

ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Created	datetime	Checked
CreatedBy	uniqueidentifier	Checked
LastModified	datetime	Checked
ModifiedBy	uniqueidentifier	Checked
IsSynchronized	bit	Checked
IsArchived	bit	Checked
Name	nvarchar(100)	Checked
Description	nvarchar(100)	Checked
InterviewQuestion	uniqueidentifier	Checked
Category	int	Checked
AppointmentType	uniqueidentifier	Checked
Drug	uniqueidentifier	Checked
VaccineType	uniqueidentifier	Checked
ProcedureType	uniqueidentifier	Checked
ProviderSpecialty	uniqueidentifier	Checked
Frequency	int	Checked
PatientCriteria	nvarchar(MAX)	Checked
OptimisticLockField	int	Checked
GCRecord	int	Checked
Entity	int	Checked
DefaultStatus	int	Checked
EncounterType	uniqueidentifier	Checked

Goal Type Tables: (Goal Type is derived from Observation Type and Chart Item class)

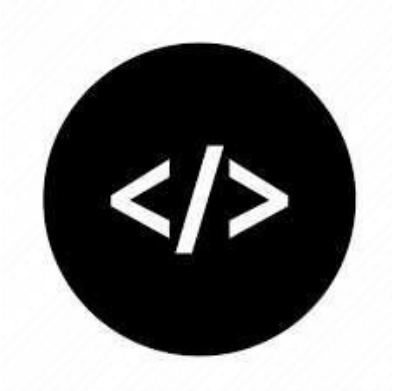
Observation Type Table:

ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Code	nvarchar(100)	Checked
CodeNumber	float	Checked
UmlsCui	nvarchar(100)	Checked
CodeType	int	Checked
ICD9	nvarchar(200)	Checked
ICD10	nvarchar(200)	Checked
ProblemCategory	uniqueidentifier	Checked
MediTalkID	int	Checked
ProblemStatus	int	Checked
FindingCategory	uniqueidentifier	Checked
GoalCategory	uniqueidentifier	Checked
AchievedCriteria	nvarchar(MAX)	Checked
PatientGoal	bit	Checked
ProviderGoal	bit	Checked
PatientCriteria	nvarchar(MAX)	Checked
ChartCriteria	nvarchar(MAX)	Checked
ChartCriteriaType	nvarchar(100)	Checked
TextMacro	uniqueidentifier	Checked
InterviewTemplate	uniqueidentifier	Checked
Priority	int	Checked
TargetMeasure	uniqueidentifier	Checked
TargetRangeStart	float	Checked
TargetRangeEnd	float	Checked
TargetDurationPeriod	int	Checked
TargetDurationType	int	Checked
GoalTypeReport	uniqueidentifier	Checked

Chart Item Table:

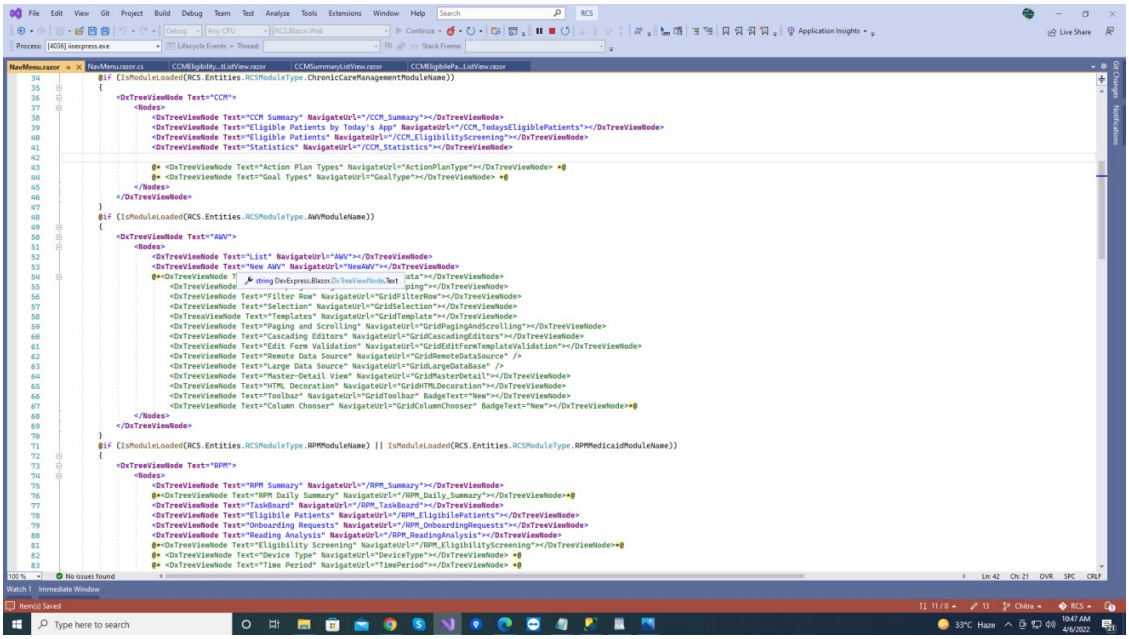
ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Created	datetime	Checked
CreatedBy	uniqueidentifier	Checked
LastModified	datetime	Checked
ModifiedBy	uniqueidentifier	Checked
IsSynchronized	bit	Checked
IsArchived	bit	Checked
Name	nvarchar(500)	Checked
Description	nvarchar(4000)	Checked
SnomedConcept	bigint	Checked
PatientDescription	nvarchar(250)	Checked
ClinicianDescription	nvarchar(250)	Checked
MaxPerPatient	numeric(10, 0)	Checked
MaxPerEncounter	numeric(10, 0)	Checked
MinTimeBetweenMultipe	Checked	Checked
TargetChartItemType	nvarchar(100)	Checked
OptimisticLockField	int	Checked
GCRecord	int	Checked
ObjectType	int	Checked

CODE DESIGN



CODE DESIGN

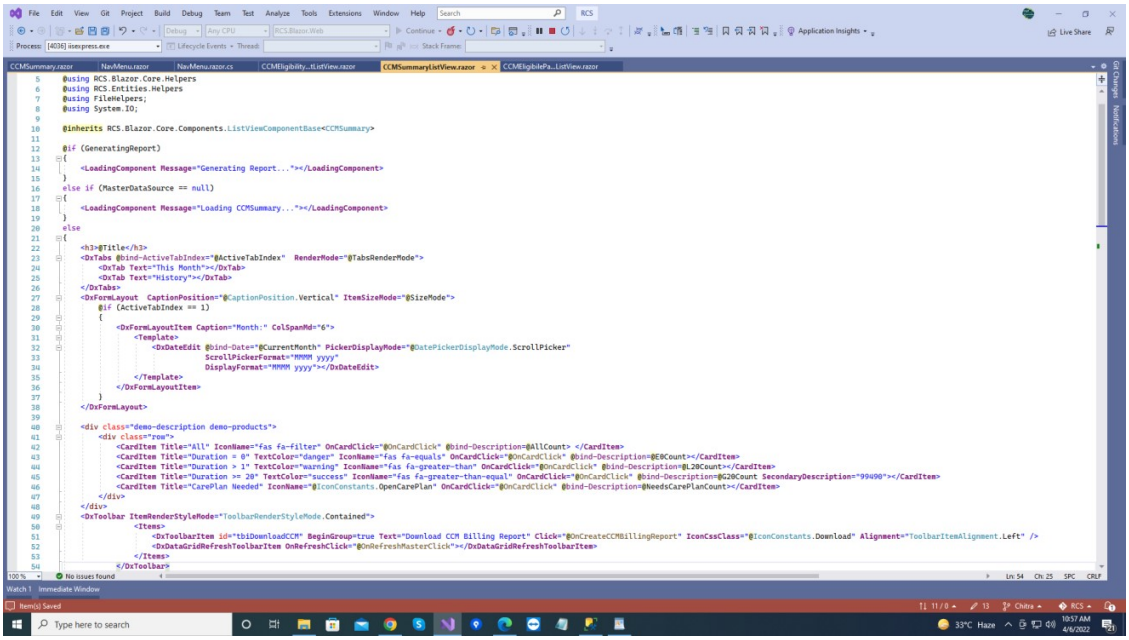
CCM Tree View:



```
@if (IsModuleLoaded(RCS.Entities.RCSModuleType.ChronicCareManagementModuleName))
{
    <DxTreeViewNode Text="CCM">
        <Nodes>
            <DxTreeViewNode Text="CCM Summary" NavigateUrl="/CCM_Summary"></DxTreeViewNode>
            <DxTreeViewNode Text="Eligible Patients by Today's App" NavigateUrl="/CCM_TodaysEligiblePatients"></DxTreeViewNode>
            <DxTreeViewNode Text="Eligible Patients" NavigateUrl="/CCM_EligibilityScreening"></DxTreeViewNode>
            <DxTreeViewNode Text="Statistics" NavigateUrl="/CCM_Statistics"></DxTreeViewNode>

            @* <DxTreeViewNode Text="Action Plan Types" NavigateUrl="ActionPlanType"></DxTreeViewNode> *@
            @* <DxTreeViewNode Text="Goal Types" NavigateUrl="GoalType"></DxTreeViewNode> *@
        </Nodes>
    </DxTreeViewNode>
}
@if (IsModuleLoaded(RCS.Entities.RCSModuleType.AWVModuleName))
{
    <DxTreeViewNode Text="AWV">
        <Nodes>
            <DxTreeViewNode Text="List" NavigateUrl="AWV"></DxTreeViewNode>
            <DxTreeViewNode Text="New AWV" NavigateUrl="NewAWV"></DxTreeViewNode>
            @*<DxTreeViewNode T
                <DxTreeViewNode
                <DxTreeViewNode Text="Filter Row" NavigateUrl="GridFilterRow"></DxTreeViewNode>
                <DxTreeViewNode Text="Selection" NavigateUrl="GridSelection"></DxTreeViewNode>
                <DxTreeviewNode Text="Templates" NavigateUrl="GridTemplate"></DxTreeViewNode>
                <DxTreeViewNode Text="Paging and Scrolling" NavigateUrl="GridPagingAndScrolling"></DxTreeViewNode>
                <DxTreeViewNode Text="Cascading Editors" NavigateUrl="GridCascadingEditors"></DxTreeViewNode>
                <DxTreeViewNode Text="Edit Form Validation" NavigateUrl="GridEditFormTemplateValidation"></DxTreeViewNode>
                <DxTreeViewNode Text="Remote Data Source" NavigateUrl="GridRemoteDataSource" />
                <DxTreeViewNode Text="Large Data Source" NavigateUrl="GridLargeDataBase" />
                <DxTreeViewNode Text="Master-Detail View" NavigateUrl="GridMasterDetail"></DxTreeViewNode>
                <DxTreeViewNode Text="HTML Decoration" NavigateUrl="GridHTMLDecoration"></DxTreeViewNode>
                <DxTreeViewNode Text="Toolbar" NavigateUrl="GridToolbar" BadgeText="New"></DxTreeViewNode>
                <DxTreeViewNode Text="Column Chooser" NavigateUrl="GridColumnChooser" BadgeText="New"></DxTreeViewNode>*@
        </Nodes>
    </DxTreeViewNode>
}
@if (IsModuleLoaded(RCS.Entities.RCSModuleType.RPMModuleName) || IsModuleLoaded(RCS.Entities.RCSModuleType.RPMMedicaidModuleName))
{
    <DxTreeViewNode Text="RPM">
        <Nodes>
            <DxTreeViewNode Text="RPM Summary" NavigateUrl="/RPM_Summary"></DxTreeViewNode>
            @*<DxTreeViewNode Text="RPM Daily Summary" NavigateUrl="/RPM_Daily_Summary"></DxTreeViewNode>*@
            <DxTreeViewNode Text="TaskBoard" NavigateUrl="/RPM_TaskBoard"></DxTreeViewNode>
            <DxTreeViewNode Text="Eligible Patients" NavigateUrl="/RPM_EligiblePatients"></DxTreeViewNode>
            <DxTreeViewNode Text="Onboarding Requests" NavigateUrl="/RPM_OnboardingRequests"></DxTreeViewNode>
            <DxTreeViewNode Text="Reading Analysis" NavigateUrl="/RPM_ReadingAnalysis"></DxTreeViewNode>
            @*<DxTreeViewNode Text="Eligibility Screening" NavigateUrl="/RPM_EligibilityScreening"></DxTreeViewNode>*@
            @* <DxTreeViewNode Text="Device Type" NavigateUrl="DeviceType"></DxTreeViewNode> *@
            @* <DxTreeViewNode Text="Time Period" NavigateUrl="TimePeriod"></DxTreeViewNode> *@
```

CCM Summary List View:

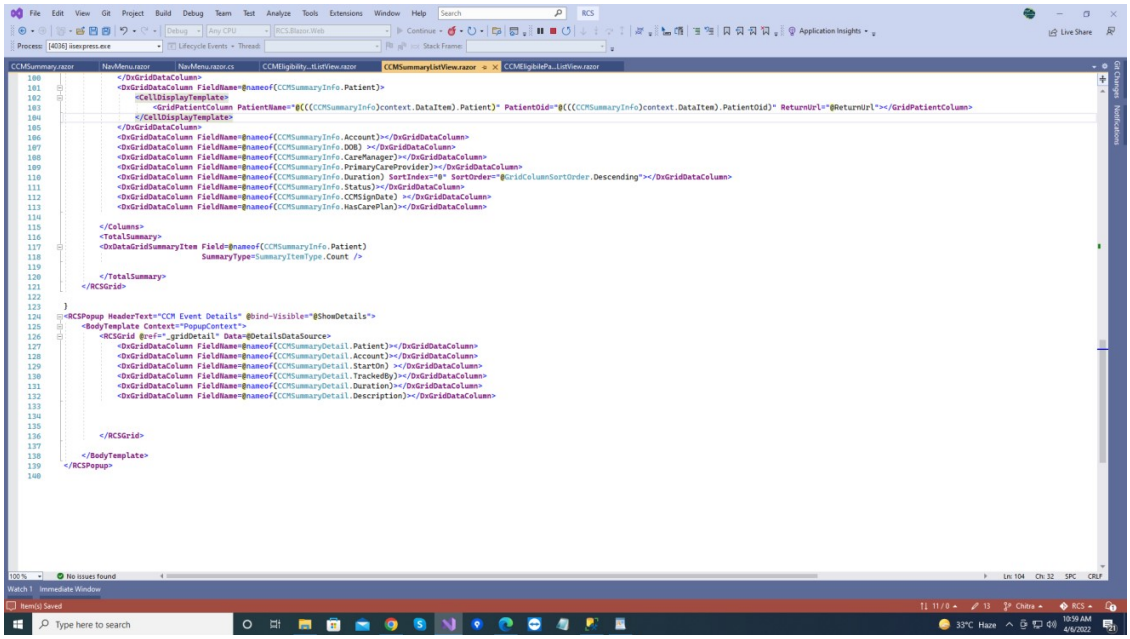


```
@using RCS.Blazor.Core.Helpers
@using RCS.Entities.Helpers
@using FileHelpers;
@using System.IO;

@inherits RCS.Blazor.Core.Components.ListViewComponentBase<CCMSummary>

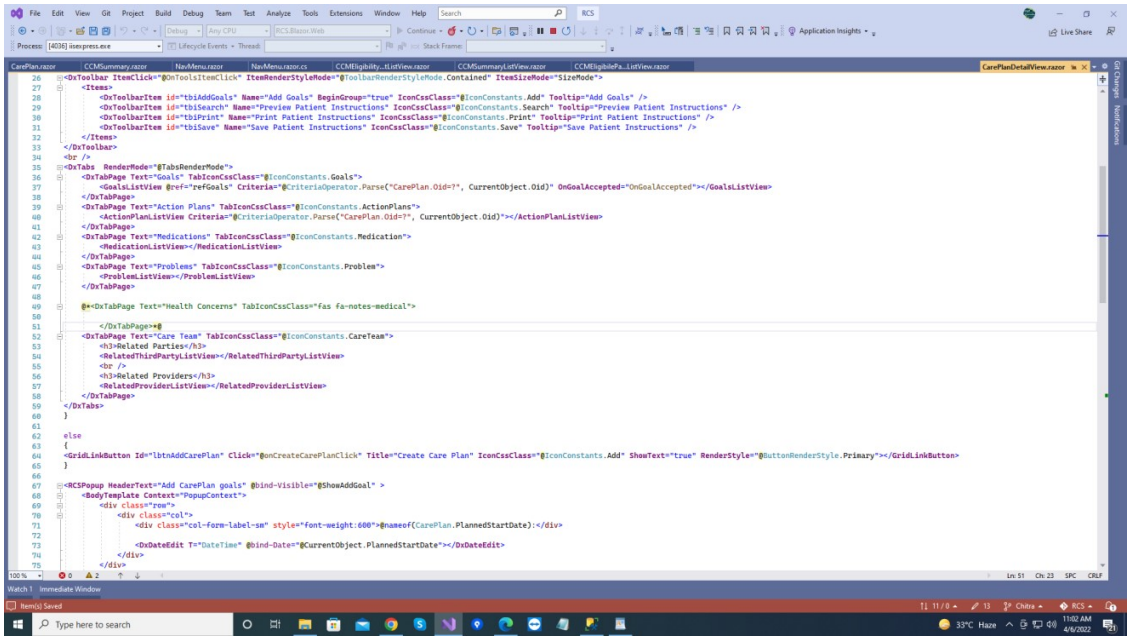
@if (GeneratingReport)
{
    <LoadingComponent Message="Generating Report..."></LoadingComponent>
}
else if (MasterDataSource == null)
{
    <LoadingComponent Message="Loading CCMSummary..."></LoadingComponent>
}
else
{
    <h3>@Title</h3>
    <DxTabs @bind-ActiveTabIndex="@ActiveTabIndex"  RenderMode="@TabsRenderMode">
        <DxTab Text="This Month"></DxTab>
        <DxTab Text="History"></DxTab>
    </DxTabs>
    <DxFormLayout  CaptionPosition="@CaptionPosition.Vertical" ItemSizeMode="@SizeMode">
        @if (ActiveTabIndex == 1)
        {
            <DxFormLayoutItem Caption="Month:" ColSpanMd="6">
                <Template>
                    <DxDateEdit @bind-Date="@CurrentMonth" PickerDisplayMode="@DatePickerDisplayMode.ScrollPicker"
                                ScrollPickerFormat="MMMM yyyy"
                                DisplayFormat="MMMM yyyy"></DxDateEdit>
                </Template>
            </DxFormLayoutItem>
        }
    </DxFormLayout>

    <div class="demo-description demo-products">
        <div class="row">
            <CardItem Title="All" IconName="fas fa-filter" OnCardClick="@OnCardClick" @bind-Description=@AllCount> </CardItem>
            <CardItem Title="Duration = 0" TextColor="danger" IconName="fas fa-equals" OnCardClick="@OnCardClick" @bind-Description=@E0Count></CardItem>
            <CardItem Title="Duration > 1" TextColor="warning" IconName="fas fa-greater-than" OnCardClick="@OnCardClick" @bind-Description=@L20Count></CardItem>
            <CardItem Title="Duration >= 20" TextColor="success" IconName="fas fa-greater-than-equal" OnCardClick="@OnCardClick" @bind-Description=@G20Count SecondaryDescription="99490"></CardItem>
            <CardItem Title="CarePlan Needed" IconName="@IconConstants.OpenCarePlan" OnCardClick="@OnCardClick" @bind-Description=@NeedsCarePlanCount></CardItem>
        </div>
    </div>
    <DxToolbar ItemRenderStyleMode="ToolbarRenderStyleMode.Contained">
        <Items>
            <DxToolbarItem id="tbiDownloadCCM" BeginGroup=true Text="Download CCM Billing Report" Click="@OnCreateCCMBillingReport" IconCssClass="@IconConstants.Download" Alignment="ToolbarItemAlignment.Left" />
            <DxDataGridRefreshToolbarItem OnRefreshClick="@OnReRefreshMasterClick"></DxDataGridRefreshToolbarItem>
        </Items>
    </DxToolbar>
```

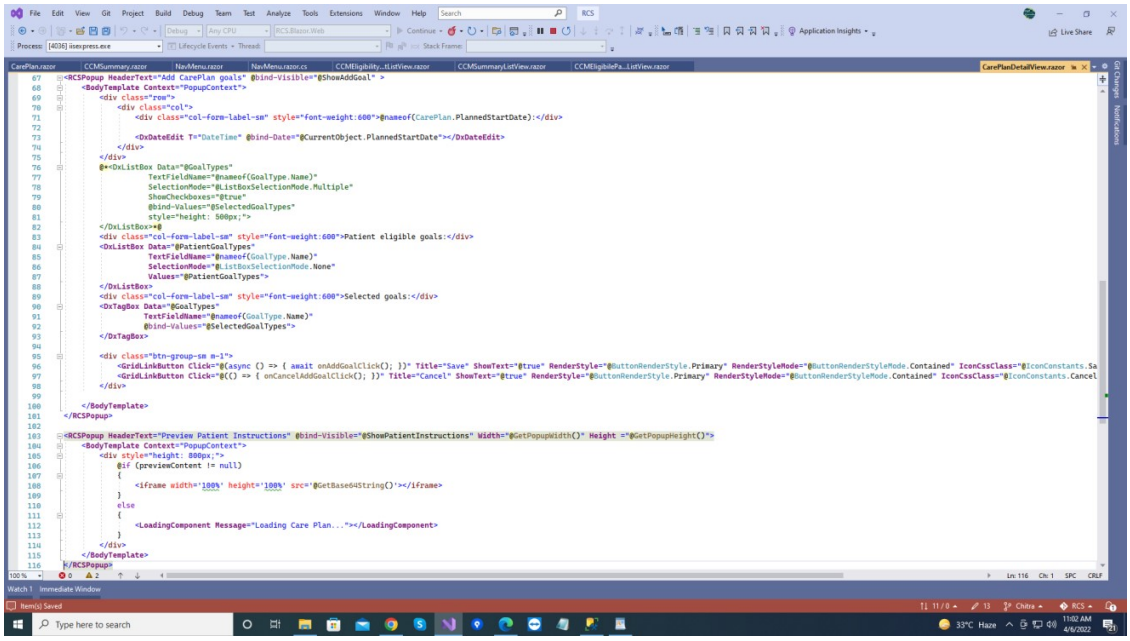


On clicking Open Care Plan Button in the List:

CarePlan Detail View:



On Clicking Add Goals:



```
<RCSPopup HeaderText="Add CarePlan goals" @bind-Visible="@ShowAddGoal" >
    <BodyTemplate Context="PopupContext">
        <div class="row">
            <div class="col">
                <div class="col-form-label-sm" style="font-weight:600">@nameof(CarePlan.PlannedStartDate):</div>

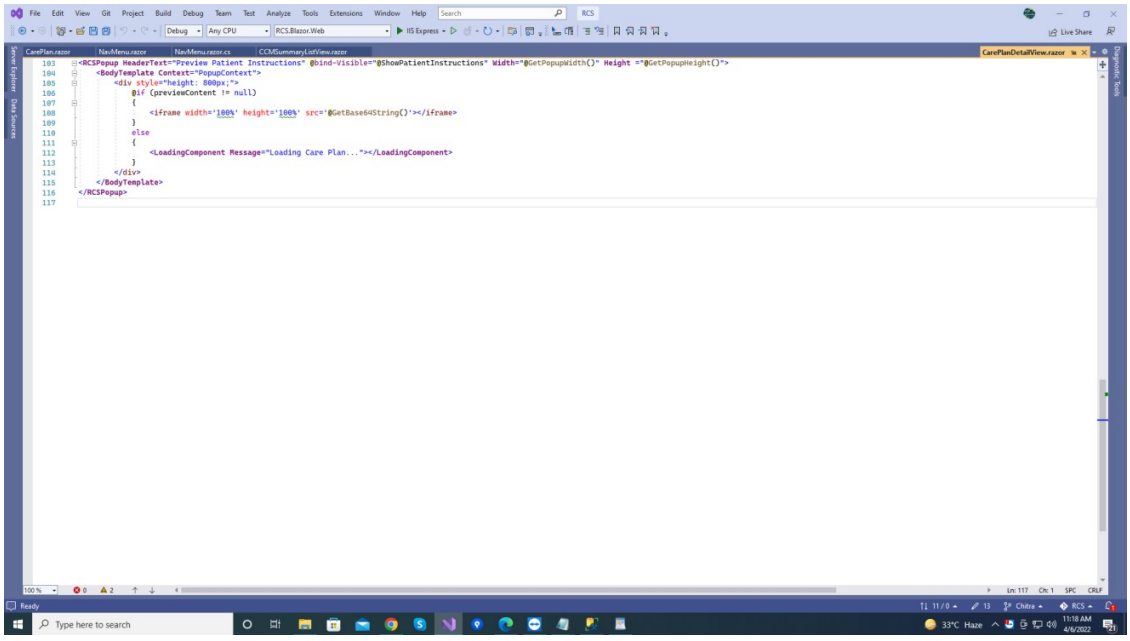
                <DxDateEdit T="DateTime" @bind-Date="@CurrentObject.PlannedStartDate"></DxDateEdit>
            </div>
        </div>
        @*<DxListBox Data="@GoalTypes"
                   TextFieldName="@nameof(GoalType.Name)"
                   SelectionMode="@ListBoxSelectionMode.Multiple"
                   ShowCheckboxes="@true"
                   @bind-Values="@SelectedGoalTypes"
                   style="height: 500px;">
        </DxListBox>*@
        <div class="col-form-label-sm" style="font-weight:600">Patient eligible goals:</div>
        <DxListBox Data="@PatientGoalTypes"
                   TextFieldName="@nameof(GoalType.Name)"
                   SelectionMode="@ListBoxSelectionMode.None"
                   Values="@PatientGoalTypes">
        </DxListBox>
        <div class="col-form-label-sm" style="font-weight:600">Selected goals:</div>
        <DxTagBox Data="@GoalTypes"
                  TextFieldName="@nameof(GoalType.Name)"
                  @bind-Values="@SelectedGoalTypes">
        </DxTagBox>

        <div class="btn-group-sm m-1">
            <GridLinkButton Click="@(async () => { await onAddGoalClick(); })" Title="Save" ShowText="@true" RenderStyle="@ButtonRenderStyle.Primary" RenderStyleMode="@ButtonRenderStyleMode.Contained" IconCssClass="@IconConstants.Sa
            <GridLinkButton Click="@(() => { onCancelAddGoalClick(); })" Title="Cancel" ShowText="@true" RenderStyle="@ButtonRenderStyle.Primary" RenderStyleMode="@ButtonRenderStyleMode.Contained" IconCssClass="@IconConstants.Cancel
        </div>

    </BodyTemplate>
</RCSPopup>

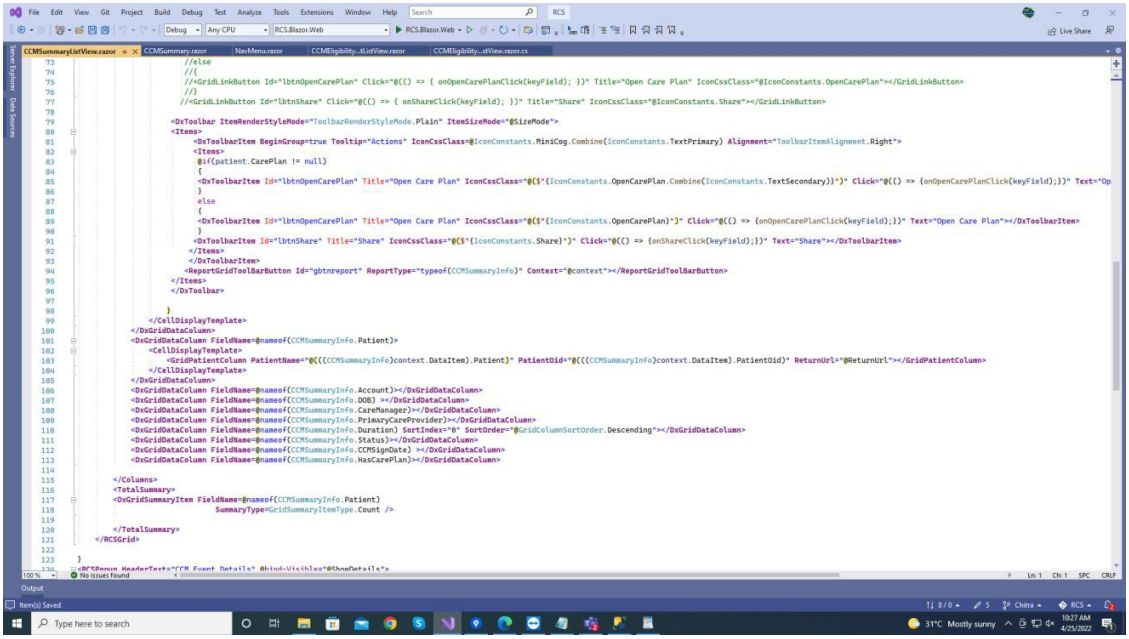
<RCSPopup HeaderText="Preview Patient Instructions" @bind-Visible="@ShowPatientInstructions" Width="@GetPopupWidth()" Height ="@GetPopupHeight()">
    <BodyTemplate Context="PopupContext">
        <div style="height: 800px;">
            @if (previewContent != null)
            {
                <iframe width='100%' height='100%' src='@GetBase64String()'></iframe>
            }
            else
            {
                <LoadingComponent Message="Loading Care Plan..."></LoadingComponent>
            }
        </div>
    </BodyTemplate>
</RCSPopup>
```

On Clicking Patient Preview Instructions:

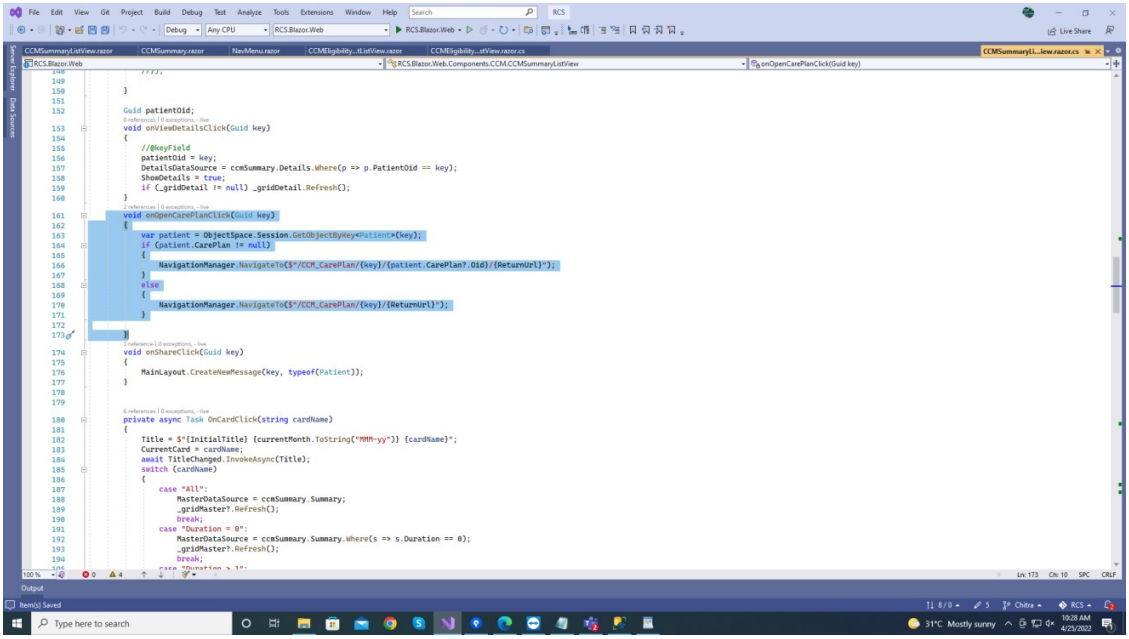


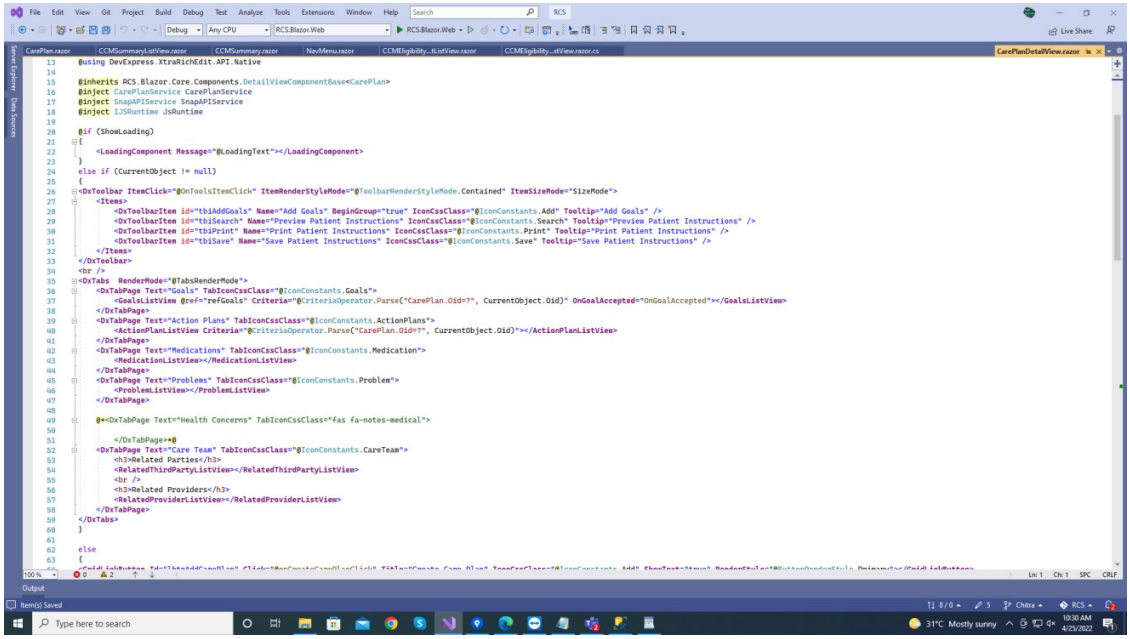
```
<RCSPopup HeaderText="Preview Patient Instructions" @bind-Visible="@ShowPatientInstructions" Width="@GetPopupWidth()" Height ="@GetPopupHeight()">
    <BodyTemplate Context="PopupContext">
        <div style="height: 800px;">
            @if (previewContent != null)
            {
                <iframe width='100%' height='100%' src='@GetBase64String()'></iframe>
            }
            else
            {
                <LoadingComponent Message="Loading Care Plan..."></LoadingComponent>
            }
        </div>
    </BodyTemplate>
</RCSPopup>
```

On Clicking CCM Summary:



On Clicking Open Care Plan:





```
@using DevExpress.XtraRichEdit.API.Native

@inherits RCS.Blazor.Core.Components.DetailViewComponentBase<CarePlan>
@inject CarePlanService CarePlanService
@inject SnapAPIService SnapAPIService
@inject IJSRuntime JsRuntime

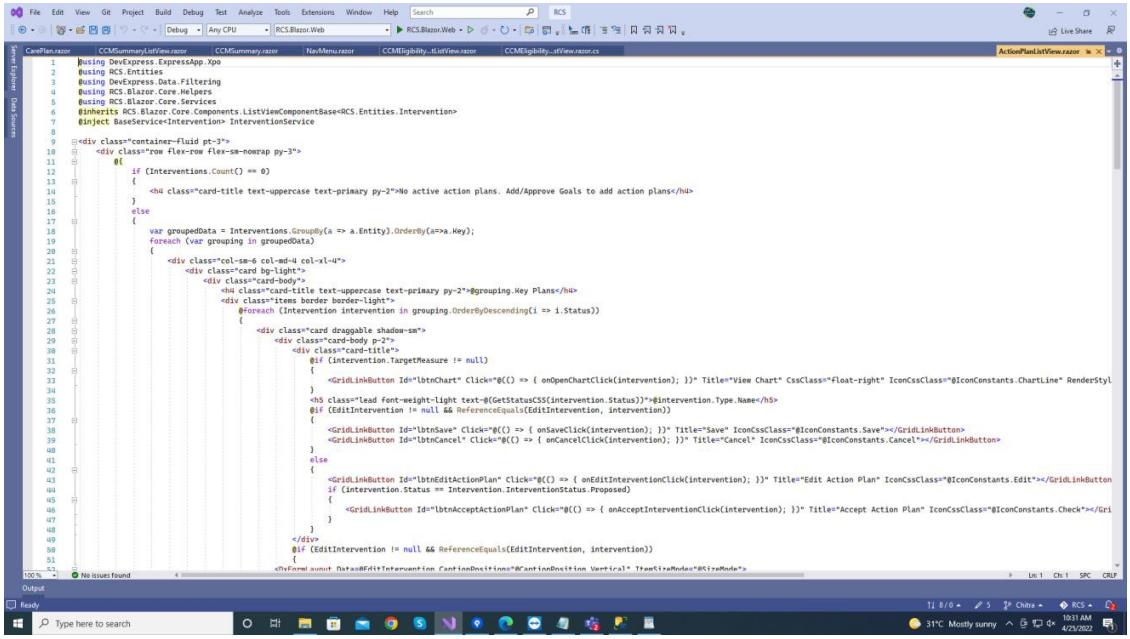
@if (ShowLoading)
{
    <LoadingComponent Message="@LoadingText"></LoadingComponent>
}
else if (CurrentObject != null)
{
<DxToolbar ItemClick="@OnToolsItemClick" ItemRenderStyleMode="@ToolbarRenderStyleMode.Contained" ItemSizeMode="SizeMode">
    <Items>
        <DxToolbarItem id="tbiAddGoals" Name="Add Goals" BeginGroup="true" IconCssClass="@IconConstants.Add" Tooltip="Add Goals" />
        <DxToolbarItem id="tbiSearch" Name="Preview Patient Instructions" IconCssClass="@IconConstants.Search" Tooltip="Preview Patient Instructions" />
        <DxToolbarItem id="tbiPrint" Name="Print Patient Instructions" IconCssClass="@IconConstants.Print" Tooltip="Print Patient Instructions" />
        <DxToolbarItem id="tbiSave" Name="Save Patient Instructions" IconCssClass="@IconConstants.Save" Tooltip="Save Patient Instructions" />
    </Items>
</DxToolbar>
<br />
<DxTabs  RenderMode="@TabsRenderMode">
    <DxTabPage Text="Goals" TabIconCssClass="@IconConstants.Goals">
        <GoalsListView @ref="refGoals" Criteria="@CriteriaOperator.Parse("CarePlan.Oid=?", CurrentObject.Oid)" OnGoalAccepted="OnGoalAccepted"></GoalsListView>
    </DxTabPage>
    <DxTabPage Text="Action Plans" TabIconCssClass="@IconConstants.ActionPlans">
        <ActionPlanListView Criteria="@CriteriaOperator.Parse("CarePlan.Oid=?", CurrentObject.Oid)"></ActionPlanListView>
    </DxTabPage>
    <DxTabPage Text="Medications" TabIconCssClass="@IconConstants.Medication">
        <MedicationListView></MedicationListView>
    </DxTabPage>
    <DxTabPage Text="Problems" TabIconCssClass="@IconConstants.Problem">
        <ProblemListView></ProblemListView>
    </DxTabPage>

    @*<DxTabPage Text="Health Concerns" TabIconCssClass="fas fa-notes-medical">

        </DxTabPage>*@
    <DxTabPage Text="Care Team" TabIconCssClass="@IconConstants.CareTeam">
        <h3>Related Parties</h3>
        <RelatedThirdPartyListView></RelatedThirdPartyListView>
        <br />
        <h3>Related Providers</h3>
        <RelatedProviderListView></RelatedProviderListView>
    </DxTabPage>
</DxTabs>
}

else
{
```

On Clicking Action Plan:

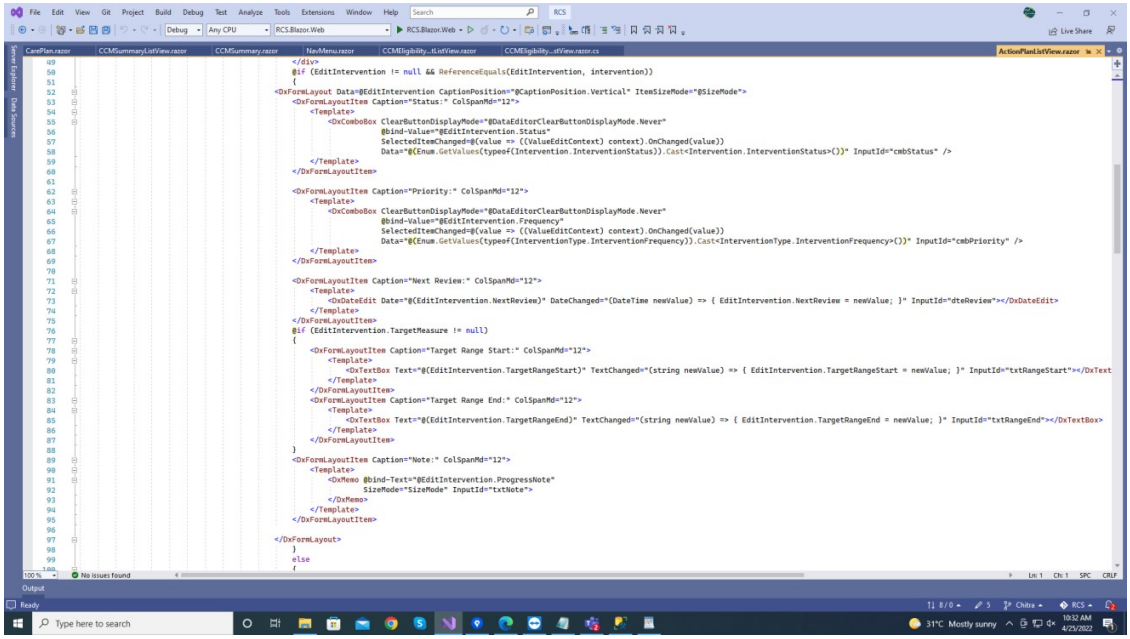


```
@using DevExpress.ExpressApp.Xpo
@using RCS.Entities
@using DevExpress.Data.Filtering
@using RCS.Blazor.Core.Helpers
@using RCS.Blazor.Core.Services
@inherits RCS.Blazor.Core.Components.ListViewComponentBase<RCS.Entities.Intervention>
@inject BaseService<Intervention> InterventionService

<div class="container-fluid pt-3">
    <div class="row flex-row flex-sm-nowrap py-3">
        @{
            if (Interventions.Count() == 0)
            {
                <h4 class="card-title text-uppercase text-primary py-2">No active action plans. Add/Approve Goals to add action plans</h4>
            }
            else
            {
                var groupedData = Interventions.GroupBy(a => a.Entity).OrderBy(a=>a.Key);
                foreach (var grouping in groupedData)
                {
                    <div class="col-sm-6 col-md-4 col-xl-4">
                        <div class="card bg-light">
                            <div class="card-body">
                                <h4 class="card-title text-uppercase text-primary py-2">@grouping.Key Plans</h4>
                                <div class="items border border-light">
                                    @foreach (Intervention intervention in grouping.OrderByDescending(i => i.Status))
                                    {
                                        <div class="card draggable shadow-sm">
                                            <div class="card-body p-2">
                                                <div class="card-title">
                                                    @if (intervention.TargetMeasure != null)
                                                    {
                                                        <GridLinkButton Id="lbtnChart" Click="@(() => { onOpenChartClick(intervention); })" Title="View Chart" CssClass="float-right" IconCssClass="@IconConstants.ChartLine" RenderStyl
                                                    }
                                                    <h5 class="lead font-weight-light text-@(GetStatusCSS(intervention.Status))">@intervention.Type.Name</h5>
                                                    @if (EditIntervention != null && ReferenceEquals(EditIntervention, intervention))
                                                    {

                                                        <GridLinkButton Id="lbtnSave" Click="@(() => { onSaveClick(intervention); })" Title="Save" IconCssClass="@IconConstants.Save"></GridLinkButton>
                                                        <GridLinkButton Id="lbtnCancel" Click="@(() => { onCancelClick(intervention); })" Title="Cancel" IconCssClass="@IconConstants.Cancel"></GridLinkButton>
                                                    }
                                                    else
                                                    {

                                                        <GridLinkButton Id="lbtnEditActionPlan" Click="@(() => { onEditInterventionClick(intervention); })" Title="Edit Action Plan" IconCssClass="@IconConstants.Edit"></GridLinkButton
                                                        if (intervention.Status == Intervention.InterventionStatus.Proposed)
                                                        {
                                                            <GridLinkButton Id="lbtnAcceptActionPlan" Click="@(() => { onAcceptInterventionClick(intervention); })" Title="Accept Action Plan" IconCssClass="@IconConstants.Check"></Gri
                                                        }
                                                    }
                                                </div>
                                            @if (EditIntervention != null && ReferenceEquals(EditIntervention, intervention))
                                            {
```

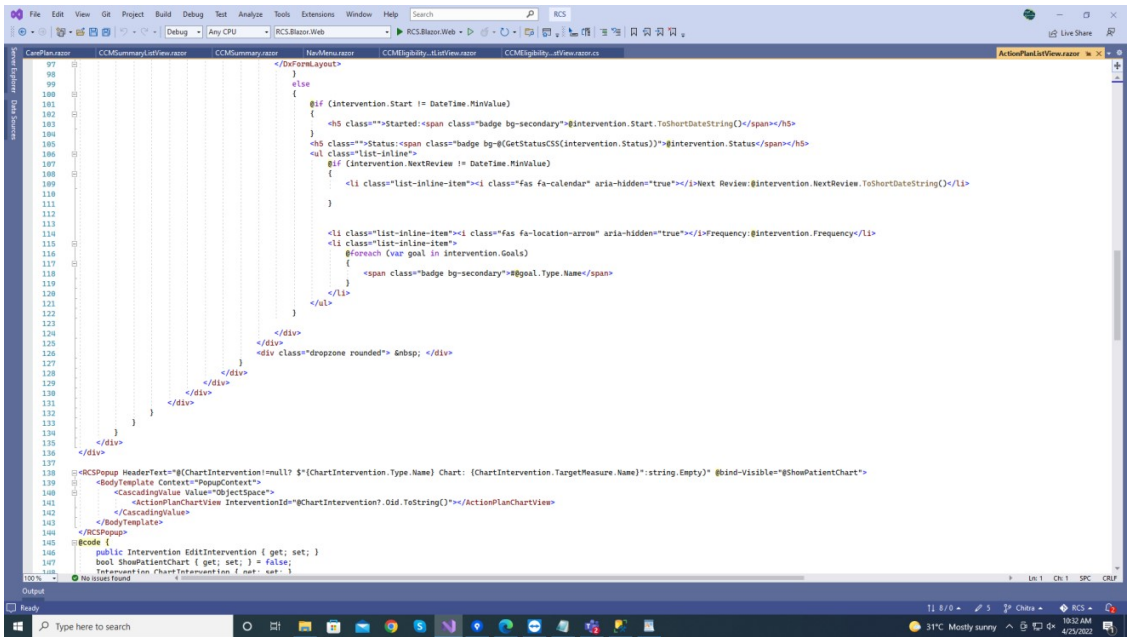


```
                                                </div>
                                                @if (EditIntervention != null && ReferenceEquals(EditIntervention, intervention))
                                                {
                                            <DxFormLayout Data=@EditIntervention CaptionPosition="@CaptionPosition.Vertical" ItemSizeMode="@SizeMode">
                                                <DxFormLayoutItem Caption="Status:" ColSpanMd="12">
                                                    <Template>
                                                        <DxComboBox ClearButtonDisplayMode="@DataEditorClearButtonDisplayMode.Never"
                                                                    @bind-Value="@EditIntervention.Status"
                                                                    SelectedItemChanged=@(value => {(ValueEditContext) context).OnChanged(value)}
                                                                    Data="@(Enum.GetValues(typeof(Intervention.InterventionStatus)).Cast<Intervention.InterventionStatus>())" InputId="cmbStatus" />
                                                    </Template>
                                                </DxFormLayoutItem>

                                                <DxFormLayoutItem Caption="Priority:" ColSpanMd="12">
                                                    <Template>
                                                        <DxComboBox ClearButtonDisplayMode="@DataEditorClearButtonDisplayMode.Never"
                                                                    @bind-Value="@EditIntervention.Frequency"
                                                                    SelectedItemChanged=@(value => {(ValueEditContext) context).OnChanged(value)}
                                                                    Data="@(Enum.GetValues(typeof(InterventionType.InterventionFrequency)).Cast<InterventionType.InterventionFrequency>())" InputId="cmbPriority" />
                                                    </Template>
                                                </DxFormLayoutItem>

                                                <DxFormLayoutItem Caption="Next Review:" ColSpanMd="12">
                                                    <Template>
                                                        <DxDateEdit Date="@(EditIntervention.NextReview)" DateChanged="(DateTime newValue) => { EditIntervention.NextReview = newValue; }" InputId="dteReview"></DxDateEdit>
                                                    </Template>
                                                </DxFormLayoutItem>
                                                @if (EditIntervention.TargetMeasure != null)
                                                {
                                                    <DxFormLayoutItem Caption="Target Range Start:" ColSpanMd="12">
                                                        <Template>
                                                            <DxTextBox Text="@(EditIntervention.TargetRangeStart)" TextChanged="(string newValue) => { EditIntervention.TargetRangeStart = newValue; }" InputId="txtRangeStart"></DxText
                                                        </Template>
                                                    </DxFormLayoutItem>
                                                    <DxFormLayoutItem Caption="Target Range End:" ColSpanMd="12">
                                                        <Template>
                                                            <DxTextBox Text="@(EditIntervention.TargetRangeEnd)" TextChanged="(string newValue) => { EditIntervention.TargetRangeEnd = newValue; }" InputId="txtRangeEnd"></DxTextBox>
                                                        </Template>
                                                    </DxFormLayoutItem>
                                                }
                                                <DxFormLayoutItem Caption="Note:" ColSpanMd="12">
                                                    <Template>
                                                        <DxMemo @bind-Text="@EditIntervention.ProgressNote"
                                                                SizeMode="SizeMode" InputId="txtNote">
                                                        </DxMemo>
                                                    </Template>
                                                </DxFormLayoutItem>

                                            </DxFormLayout>
                                                }
                                                else
                                                {
```



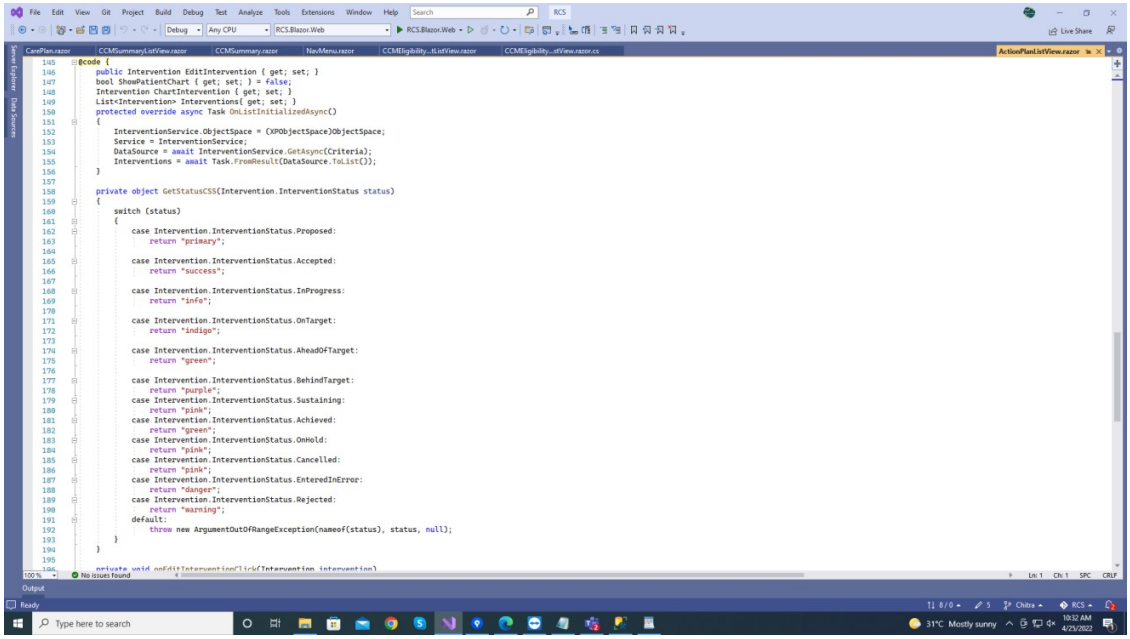
```
                                            </DxFormLayout>
                                                }
                                                else
                                                {
                                                    @if (intervention.Start != DateTime.MinValue)
                                                    {
                                                        <h5 class="">Started:<span class="badge bg-secondary">@intervention.Start.ToShortDateString()</span></h5>
                                                    }
                                                    <h5 class="">Status:<span class="badge bg-@(GetStatusCSS(intervention.Status))">@intervention.Status</span></h5>
                                                    <ul class="list-inline">
                                                        @if (intervention.NextReview != DateTime.MinValue)
                                                        {
                                                            <li class="list-inline-item"><i class="fas fa-calendar" aria-hidden="true"></i>Next Review:@intervention.NextReview.ToShortDateString()</li>

                                                        }


                                                        <li class="list-inline-item"><i class="fas fa-location-arrow" aria-hidden="true"></i>Frequency:@intervention.Frequency</li>
                                                        <li class="list-inline-item">
                                                            @foreach (var goal in intervention.Goals)
                                                            {
                                                                <span class="badge bg-secondary">#@goal.Type.Name</span>
                                                            }
                                                        </li>
                                                    </ul>
                                                }

                                            </div>
                                        </div>
                                        <div class="dropzone rounded">   </div>
                                    }
                                </div>
                            </div>
                        </div>
                    </div>
                }
            }
        </div>
    </div>

<RCSPopup HeaderText="@(ChartIntervention!=null? $"{ChartIntervention.Type.Name} Chart: {ChartIntervention.TargetMeasure.Name}":string.Empty)" @bind-Visible="@ShowPatientChart">
    <BodyTemplate Context="PopupContext">
        <CascadingValue Value="ObjectSpace">
            <ActionPlanChartView InterventionId="@ChartIntervention?.Oid.ToString()"></ActionPlanChartView>
        </CascadingValue>
    </BodyTemplate>
</RCSPopup>
@code {
    public Intervention EditIntervention { get; set; }
    bool ShowPatientChart { get; set; } = false;
    Intervention ChartIntervention { get; set; }
```



```
@code {
    public Intervention EditIntervention { get; set; }
    bool ShowPatientChart { get; set; } = false;
    Intervention ChartIntervention { get; set; }
    List<Intervention> Interventions{ get; set; }
    protected override async Task OnListInitializedAsync()
    {
        InterventionService.ObjectSpace = (XPObjectSpace)ObjectSpace;
        Service = InterventionService;
        DataSource = await InterventionService.GetAsync(Criteria);
        Interventions = await Task.FromResult(DataSource.ToList());
    }

    private object GetStatusCSS(Intervention.InterventionStatus status)
    {
        switch (status)
        {
            case Intervention.InterventionStatus.Proposed:
                return "primary";

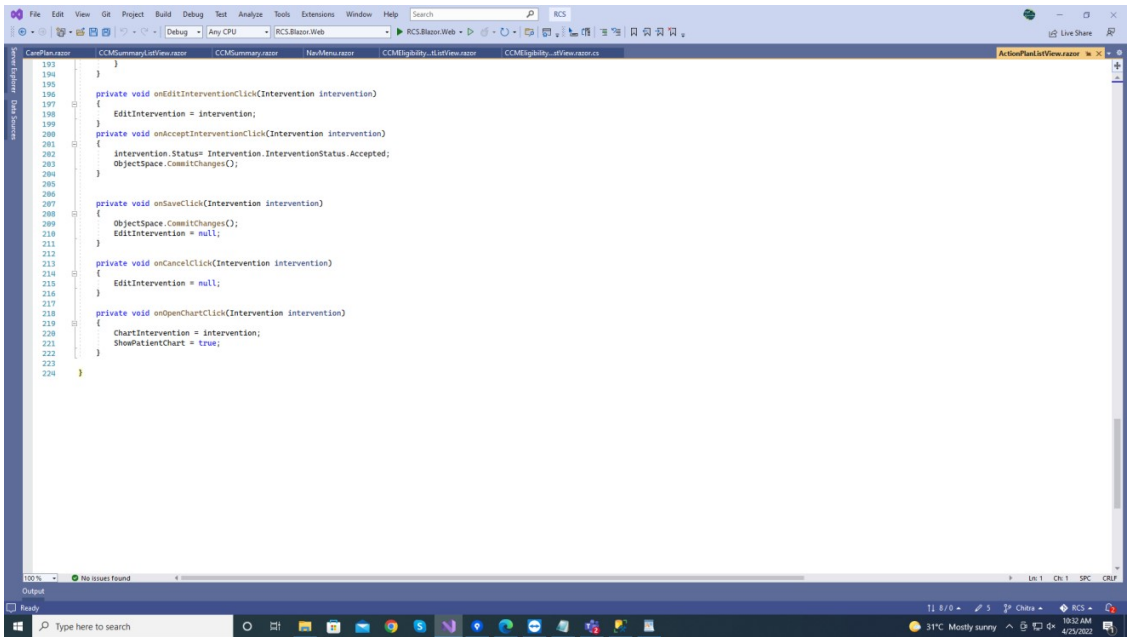
            case Intervention.InterventionStatus.Accepted:
                return "success";

            case Intervention.InterventionStatus.InProgress:
                return "info";

            case Intervention.InterventionStatus.OnTarget:
                return "indigo";

            case Intervention.InterventionStatus.AheadOfTarget:
                return "green";

            case Intervention.InterventionStatus.BehindTarget:
                return "purple";
            case Intervention.InterventionStatus.Sustaining:
                return "pink";
            case Intervention.InterventionStatus.Achieved:
                return "green";
            case Intervention.InterventionStatus.OnHold:
                return "pink";
            case Intervention.InterventionStatus.Cancelled:
                return "pink";
            case Intervention.InterventionStatus.EnteredInError:
                return "danger";
            case Intervention.InterventionStatus.Rejected:
                return "warning";
            default:
                throw new ArgumentOutOfRangeException(nameof(status), status, null);
        }
    }
```



```
    }

    private void onEditInterventionClick(Intervention intervention)
    {
        EditIntervention = intervention;
    }
    private void onAcceptInterventionClick(Intervention intervention)
    {
        intervention.Status= Intervention.InterventionStatus.Accepted;
        ObjectSpace.CommitChanges();
    }


    private void onSaveClick(Intervention intervention)
    {
        ObjectSpace.CommitChanges();
        EditIntervention = null;
    }

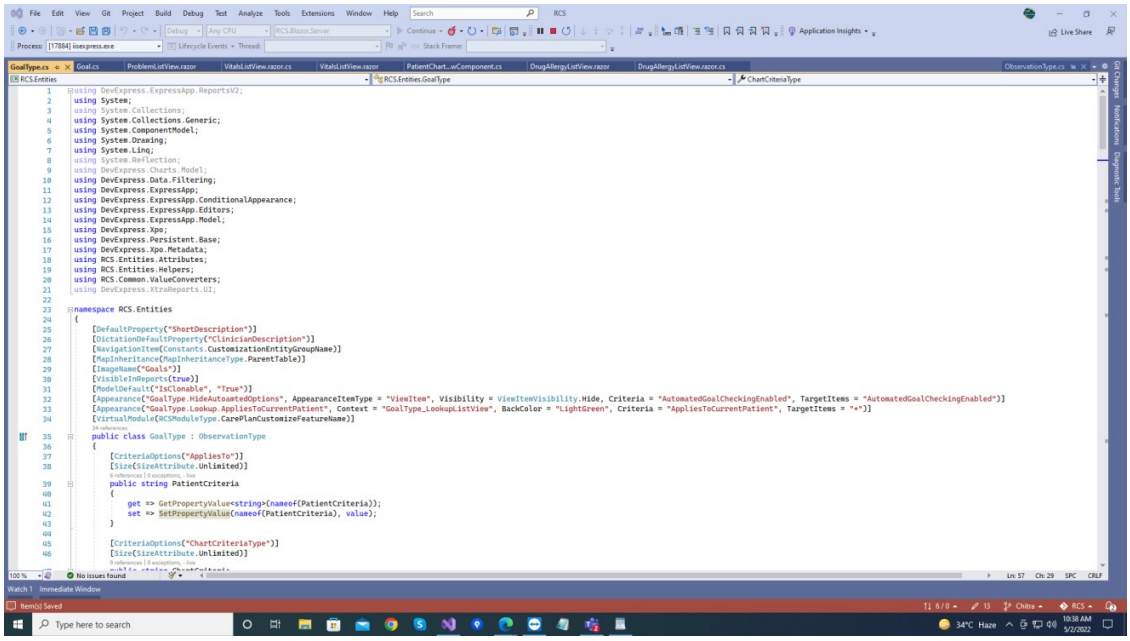
    private void onCancelClick(Intervention intervention)
    {
        EditIntervention = null;
    }

    private void onOpenChartClick(Intervention intervention)
    {
        ChartIntervention = intervention;
        ShowPatientChart = true;
    }


}
```

Goal Type:

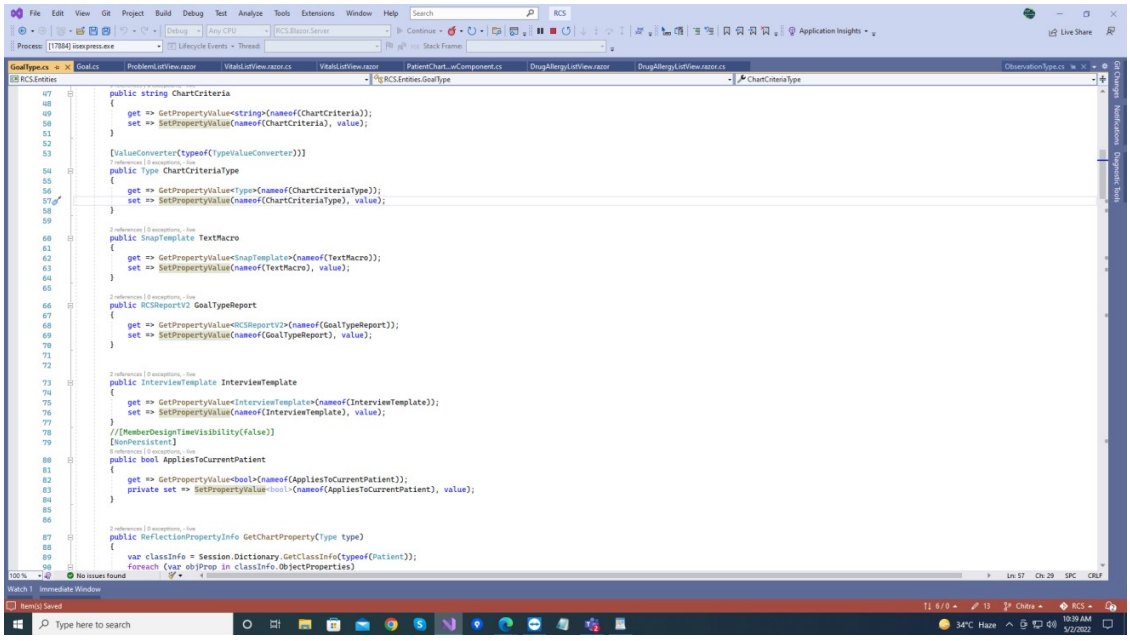
Goal Type Class:



```
using DevExpress.ExpressApp.ReportsV2;
using System;
using System.Collections;
using System.Collections.Generic;
using System.ComponentModel;
using System.Drawing;
using System.Linq;
using System.Reflection;
using DevExpress.Charts.Model;
using DevExpress.Data.Filtering;
using DevExpress.ExpressApp;
using DevExpress.ExpressApp.ConditionalAppearance;
using DevExpress.ExpressApp.Editors;
using DevExpress.ExpressApp.Model;
using DevExpress.Xpo;
using DevExpress.Persistent.Base;
using DevExpress.Xpo.Metadata;
using RCS.Entities.Attributes;
using RCS.Entities.Helpers;
using RCS.Common.ValueConverters;
using DevExpress.XtraReports.UI;

namespace RCS.Entities
{
    [DefaultProperty("ShortDescription")]
    [DictationDefaultProperty("ClinicianDescription")]
    [NavigationItem(Constants.CustomizationEntityGroupName)]
    [MapInheritance(MapInheritanceType.ParentTable)]
    [ImageName("Goals")]
    [VisibleInReports(true)]
    [ModelDefault("IsClonable", "True")]
    [Appearance("GoalType.HideAutoamtedOptions", AppearanceItemType = "ViewItem", Visibility = ViewItemVisibility.Hide, Criteria = "AutomatedGoalCheckingEnabled", TargetItems = "AutomatedGoalCheckingEnabled")]
    [Appearance("GoalType.Lookup.AppliesToCurrentPatient", Context = "GoalType_LookupListView", BackColor = "LightGreen", Criteria = "AppliesToCurrentPatient", TargetItems = "*")]
    [VirtualModule(RCSModuleType.CarePlanCustomizeFeatureName)]
    public class GoalType : ObservationType
    {
        [CriteriaOptions("AppliesTo")]
        [Size(SizeAttribute.Unlimited)]
        public string PatientCriteria
        {
            get => GetPropertyValue<string>(nameof(PatientCriteria));
            set => SetPropertyValue(nameof(PatientCriteria), value);
        }

        [CriteriaOptions("ChartCriteriaType")]
        [Size(SizeAttribute.Unlimited)]
```



```
        public string ChartCriteria
        {
            get => GetPropertyValue<string>(nameof(ChartCriteria));
            set => SetPropertyValue(nameof(ChartCriteria), value);
        }

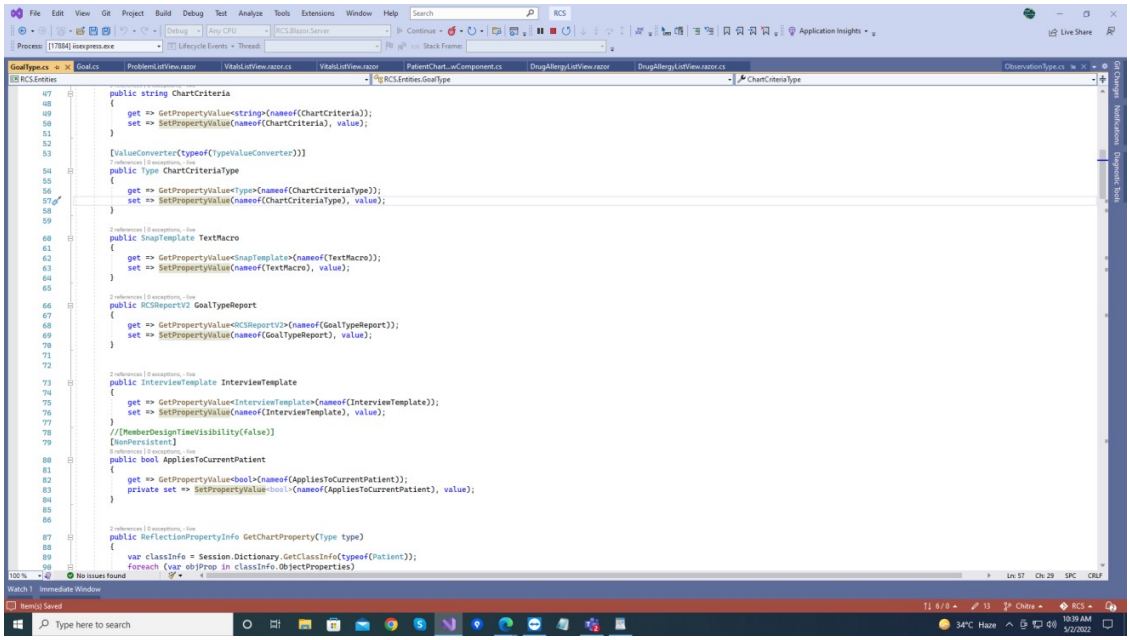
        [ValueConverter(typeof(TypeValueConverter))]
        public Type ChartCriteriaType
        {
            get => GetPropertyValue<Type>(nameof(ChartCriteriaType));
            set => SetPropertyValue(nameof(ChartCriteriaType), value);
        }

        public SnapTemplate TextMacro
        {
            get => GetPropertyValue<SnapTemplate>(nameof(TextMacro));
            set => SetPropertyValue(nameof(TextMacro), value);
        }

        public RCSReportV2 GoalTypeReport
        {
            get => GetPropertyValue<RCSReportV2>(nameof(GoalTypeReport));
            set => SetPropertyValue(nameof(GoalTypeReport), value);
        }


        public InterviewTemplate InterviewTemplate
        {
            get => GetPropertyValue<InterviewTemplate>(nameof(InterviewTemplate));
            set => SetPropertyValue(nameof(InterviewTemplate), value);
        }
        //[MemberDesignTimeVisibility(false)]
        [NonPersistent]
        public bool AppliesToCurrentPatient
        {
            get => GetPropertyValue<bool>(nameof(AppliesToCurrentPatient));
            private set => SetPropertyValue<bool>(nameof(AppliesToCurrentPatient), value);
        }


        public ReflectionPropertyInfo GetChartProperty(Type type)
        {
            var classInfo = Session.Dictionary.GetClassInfo(typeof(Patient));
            foreach (var objProp in classInfo.ObjectProperties)
```



```
public string ChartCriteria
{
    get => GetPropertyValue<string>(nameof(ChartCriteria));
    set => SetPropertyValue(nameof(ChartCriteria), value);
}

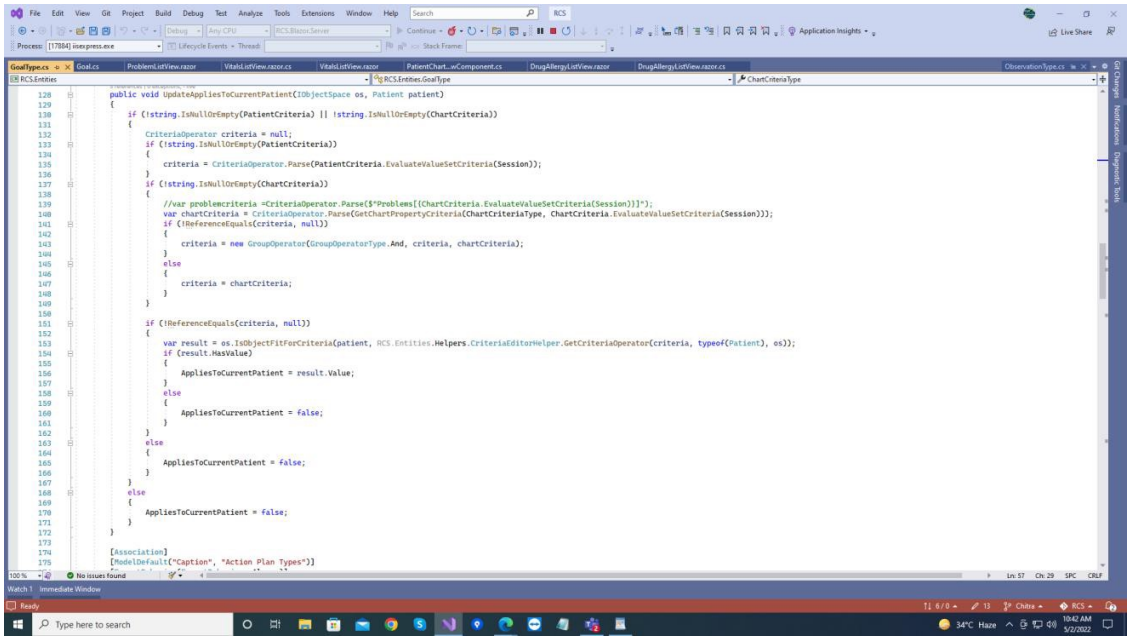
[ValueConverter(typeof(TypeValueConverter))]
public Type ChartCriteriaType
{
    get => GetPropertyValue<Type>(nameof(ChartCriteriaType));
    set => SetPropertyValue(nameof(ChartCriteriaType), value);
}

public SnapTemplate TextMacro
{
    get => GetPropertyValue<SnapTemplate>(nameof(TextMacro));
    set => SetPropertyValue(nameof(TextMacro), value);
}

public RCSReportV2 GoalTypeReport
{
    get => GetPropertyValue<RCSReportV2>(nameof(GoalTypeReport));
    set => SetPropertyValue(nameof(GoalTypeReport), value);
}


public InterviewTemplate InterviewTemplate
{
    get => GetPropertyValue<InterviewTemplate>(nameof(InterviewTemplate));
    set => SetPropertyValue(nameof(InterviewTemplate), value);
}
//[MemberDesignTimeVisibility(false)]
[NonPersistent]
public bool AppliesToCurrentPatient
{
    get => GetPropertyValue<bool>(nameof(AppliesToCurrentPatient));
    private set => SetPropertyValue<bool>(nameof(AppliesToCurrentPatient), value);
}

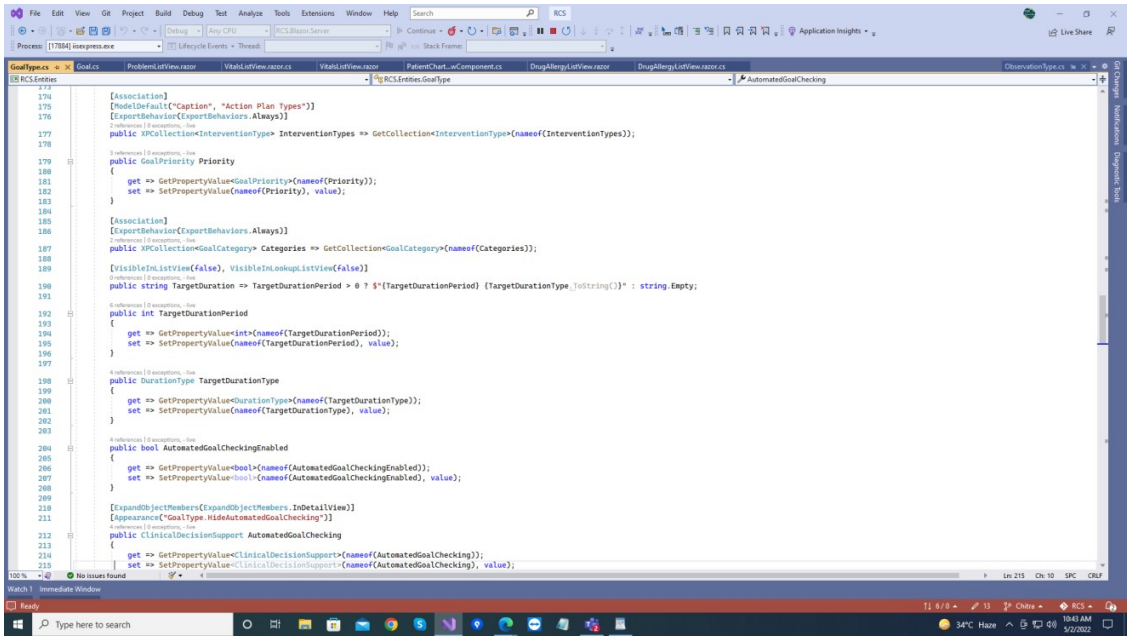

public ReflectionPropertyInfo GetChartProperty(Type type)
{
    var classInfo = Session.Dictionary.GetClassInfo(typeof(Patient));
    foreach (var objProp in classInfo.ObjectProperties)
```



```
public void UpdateAppliesToCurrentPatient(IObjectSpace os, Patient patient)
{
    if (!string.IsNullOrEmpty(PatientCriteria) || !string.IsNullOrEmpty(ChartCriteria))
    {
        CriteriaOperator criteria = null;
        if (!string.IsNullOrEmpty(PatientCriteria))
        {
            criteria = CriteriaOperator.Parse(PatientCriteria.EvaluateValueSetCriteria(Session));
        }
        if (!string.IsNullOrEmpty(ChartCriteria))
        {
            //var problemcriteria =CriteriaOperator.Parse($"Problems[{ChartCriteria.EvaluateValueSetCriteria(Session)}]");
            var chartCriteria = CriteriaOperator.Parse(GetChartPropertyCriteria(ChartCriteriaType, ChartCriteria.EvaluateValueSetCriteria(Session)));
            if (!ReferenceEquals(criteria, null))
            {
                criteria = new GroupOperator(GroupOperatorType.And, criteria, chartCriteria);
            }
            else
            {
                criteria = chartCriteria;
            }
        }

        if (!ReferenceEquals(criteria, null))
        {
            var result = os.IsObjectFitForCriteria(patient, RCS.Entities.Helpers.CriteriaEditorHelper.GetCriteriaOperator(criteria, typeof(Patient), os));
            if (result.HasValue)
            {
                AppliesToCurrentPatient = result.Value;
            }
            else
            {
                AppliesToCurrentPatient = false;
            }
        }
        else
        {
            AppliesToCurrentPatient = false;
        }
    }
    else
    {
        AppliesToCurrentPatient = false;
    }
}

[Association]
[ModelDefault("Caption", "Action Plan Types")]
```



```
[Association]
[ModelDefault("Caption", "Action Plan Types")]
[ExportBehavior(ExportBehaviors.Always)]
public XPCollection<InterventionType> InterventionTypes => GetCollection<InterventionType>(nameof(InterventionTypes));

public GoalPriority Priority
{
    get => GetPropertyValue<GoalPriority>(nameof(Priority));
    set => SetPropertyValue(nameof(Priority), value);
}

[Association]
[ExportBehavior(ExportBehaviors.Always)]
public XPCollection<GoalCategory> Categories => GetCollection<GoalCategory>(nameof(Categories));

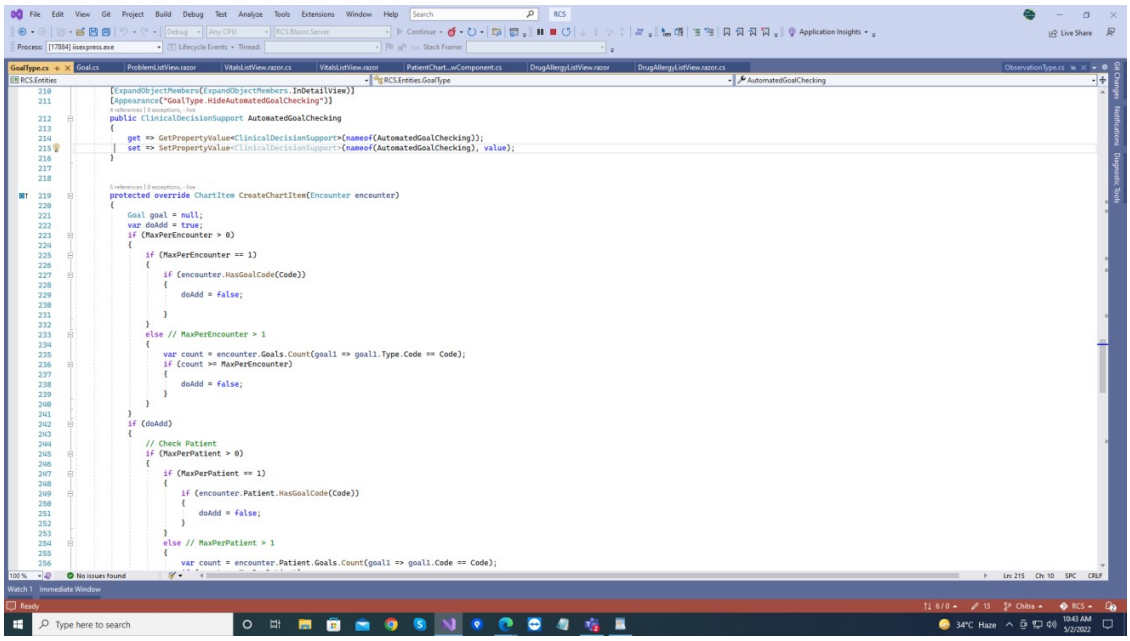
[VisibleInListView(false), VisibleInLookupListView(false)]
public string TargetDuration => TargetDurationPeriod > 0 ? $"{TargetDurationPeriod} {TargetDurationType.ToString()}" : string.Empty;

public int TargetDurationPeriod
{
    get => GetPropertyValue<int>(nameof(TargetDurationPeriod));
    set => SetPropertyValue(nameof(TargetDurationPeriod), value);
}

public DurationType TargetDurationType
{
    get => GetPropertyValue<DurationType>(nameof(TargetDurationType));
    set => SetPropertyValue(nameof(TargetDurationType), value);
}

public bool AutomatedGoalCheckingEnabled
{
    get => GetPropertyValue<bool>(nameof(AutomatedGoalCheckingEnabled));
    set => SetPropertyValue<bool>(nameof(AutomatedGoalCheckingEnabled), value);
}

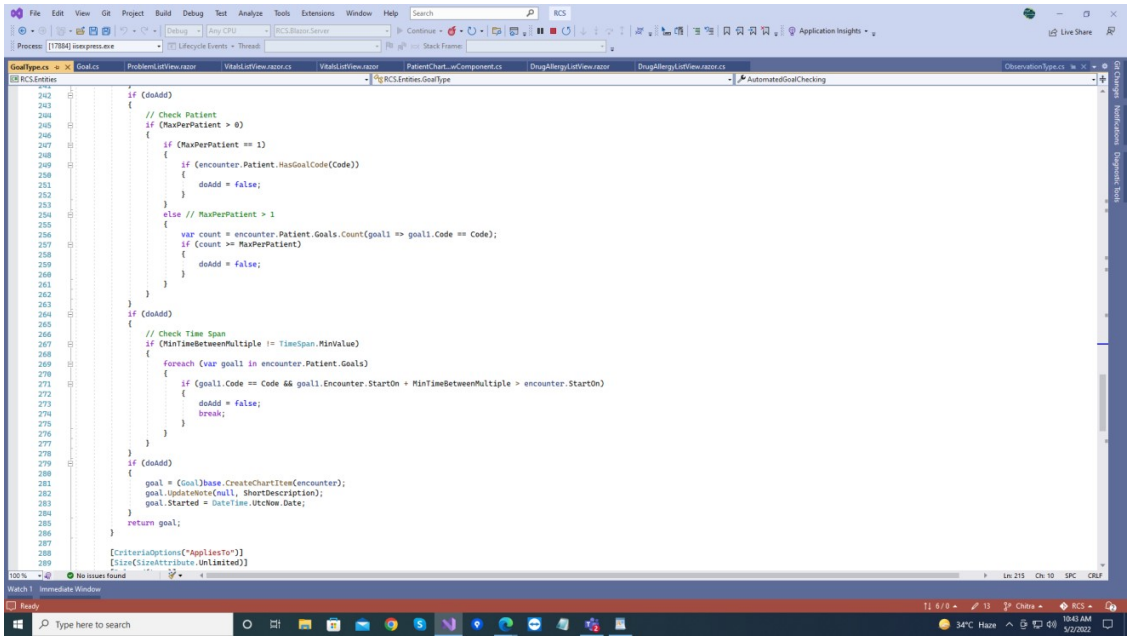
[ExpandObjectMembers(ExpandObjectMembers.InDetailView)]
[Appearance("GoalType.HideAutomatedGoalChecking")]
public ClinicalDecisionSupport AutomatedGoalChecking
{
    get => GetPropertyValue<ClinicalDecisionSupport>(nameof(AutomatedGoalChecking));
    set => SetPropertyValue<ClinicalDecisionSupport>(nameof(AutomatedGoalChecking), value);
```



```
[ExpandObjectMembers(ExpandObjectMembers.InDetailView)]
[Appearance("GoalType.HideAutomatedGoalChecking")]
public ClinicalDecisionSupport AutomatedGoalChecking
{
    get => GetPropertyValue<ClinicalDecisionSupport>(nameof(AutomatedGoalChecking));
    set => SetPropertyValue<ClinicalDecisionSupport>(nameof(AutomatedGoalChecking), value);
}

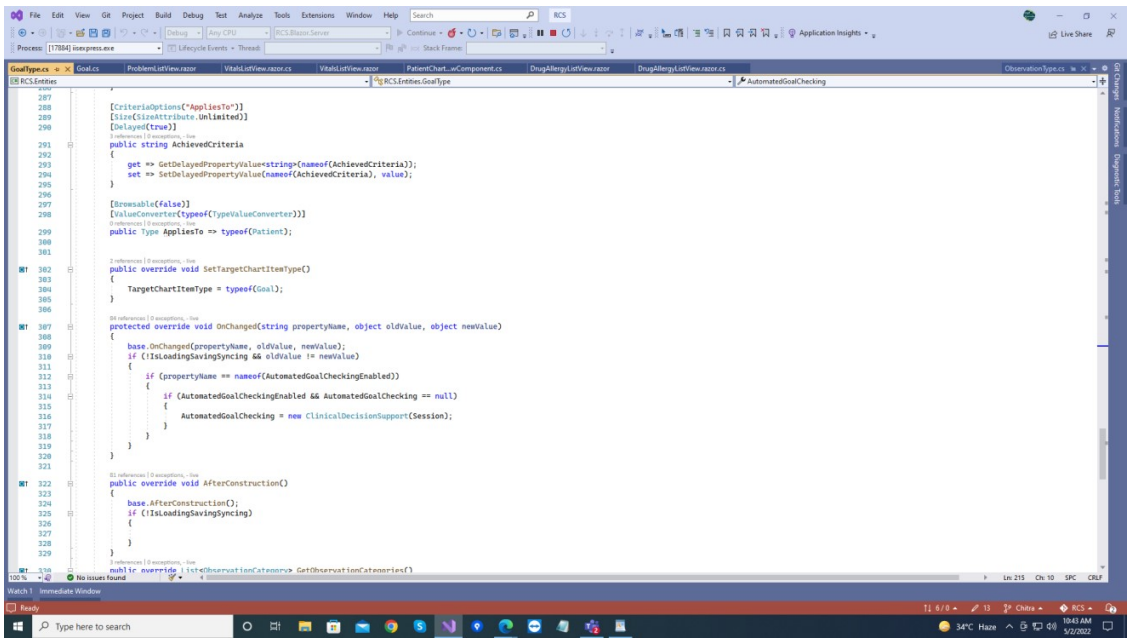

protected override ChartItem CreateChartItem(Encounter encounter)
{
    Goal goal = null;
    var doAdd = true;
    if (MaxPerEncounter > 0)
    {
        if (MaxPerEncounter == 1)
        {
            if (encounter.HasGoalCode(Code))
            {
                doAdd = false;

            }
        }
        else // MaxPerEncounter > 1
        {
            var count = encounter.Goals.Count(goal1 => goal1.Type.Code == Code);
            if (count >= MaxPerEncounter)
            {
                doAdd = false;
            }
        }
    }
    if (doAdd)
    {
        // Check Patient
        if (MaxPerPatient > 0)
        {
            if (MaxPerPatient == 1)
            {
                if (encounter.Patient.HasGoalCode(Code))
                {
                    doAdd = false;
                }
            }
            else // MaxPerPatient > 1
            {
                var count = encounter.Patient.Goals.Count(goal1 => goal1.Code == Code);
```



```
            if (doAdd)
            {
                // Check Patient
                if (MaxPerPatient > 0)
                {
                    if (MaxPerPatient == 1)
                    {
                        if (encounter.Patient.HasGoalCode(Code))
                        {
                            doAdd = false;
                        }
                    }
                    else // MaxPerPatient > 1
                    {
                        var count = encounter.Patient.Goals.Count(goal1 => goal1.Code == Code);
                        if (count >= MaxPerPatient)
                        {
                            doAdd = false;
                        }
                    }
                }
            }
            if (doAdd)
            {
                // Check Time Span
                if (MinTimeBetweenMultiple != TimeSpan.MinValue)
                {
                    foreach (var goal1 in encounter.Patient.Goals)
                    {
                        if (goal1.Code == Code && goal1.Encounter.StartOn + MinTimeBetweenMultiple > encounter.StartOn)
                        {
                            doAdd = false;
                            break;
                        }
                    }
                }
            }
            if (doAdd)
            {
                goal = (Goal)base.CreateChartItem(encounter);
                goal.UpdateNote(null, ShortDescription);
                goal.Started = DateTime.UtcNow.Date;
            }
            return goal;
        }

        [CriteriaOptions("AppliesTo")]
        [Size(SizeAttribute.Unlimited)]
```



```
        [CriteriaOptions("AppliesTo")]
        [Size(SizeAttribute.Unlimited)]
        [Delayed(true)]
        public string AchievedCriteria
        {
            get => GetDelayedPropertyValue<string>(nameof(AchievedCriteria));
            set => SetDelayedPropertyValue(nameof(AchievedCriteria), value);
        }

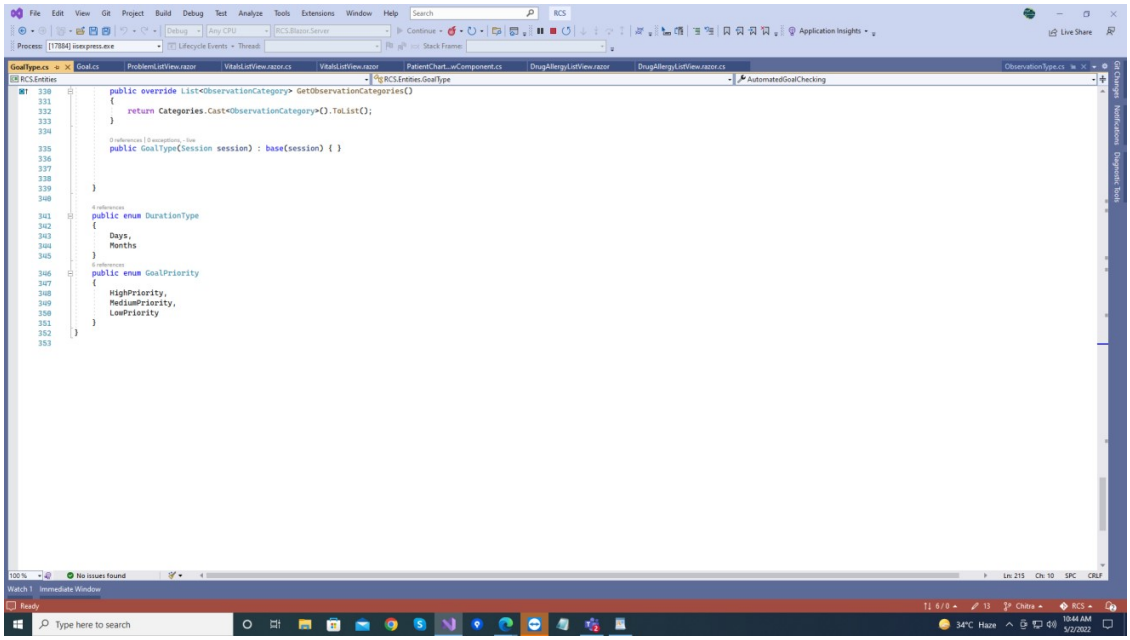
        [Browsable(false)]
        [ValueConverter(typeof(TypeValueConverter))]
        public Type AppliesTo => typeof(Patient);


        public override void SetTargetChartItemType()
        {
            TargetChartItemType = typeof(Goal);
        }

        protected override void OnChanged(string propertyName, object oldValue, object newValue)
        {
            base.OnChanged(propertyName, oldValue, newValue);
            if (!IsLoadingSavingSyncing && oldValue != newValue)
            {
                if (propertyName == nameof(AutomatedGoalCheckingEnabled))
                {
                    if (AutomatedGoalCheckingEnabled && AutomatedGoalChecking == null)
                    {
                        AutomatedGoalChecking = new ClinicalDecisionSupport(Session);
                    }
                }
            }

            public override void AfterConstruction()
            {
                base.AfterConstruction();
                if (!IsLoadingSavingSyncing)
                {

                }
            }
            public override List<ObservationCategory> GetObservationCategories()
```



```
public override List<ObservationCategory> GetObservationCategories()
{
    return Categories.Cast<ObservationCategory>().ToList();
}

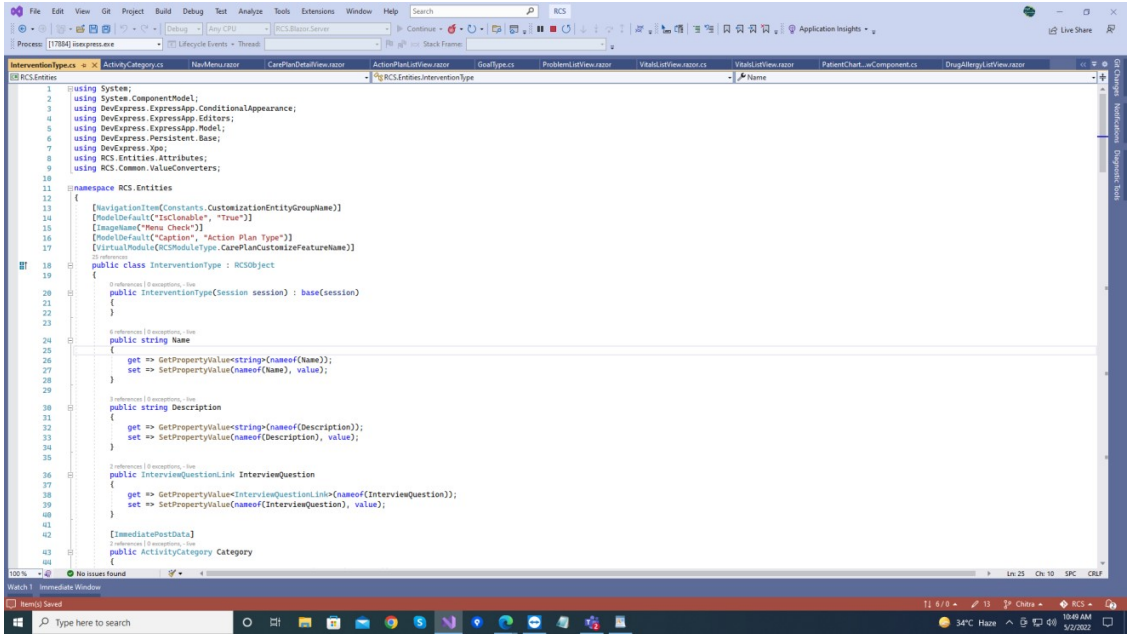
public GoalType(Session session) : base(session) { }


}

public enum DurationType
{
    Days,
    Months
}
public enum GoalPriority
{
    HighPriority,
    MediumPriority,
    LowPriority
}
}
```

Action Plan Type:

Action Plan Type Class:



```
using System;
using System.ComponentModel;
using DevExpress.ExpressApp.ConditionalAppearance;
using DevExpress.ExpressApp.Editors;
using DevExpress.ExpressApp.Model;
using DevExpress.Persistent.Base;
using DevExpress.Xpo;
using RCS.Entities.Attributes;
using RCS.Common.ValueConverters;

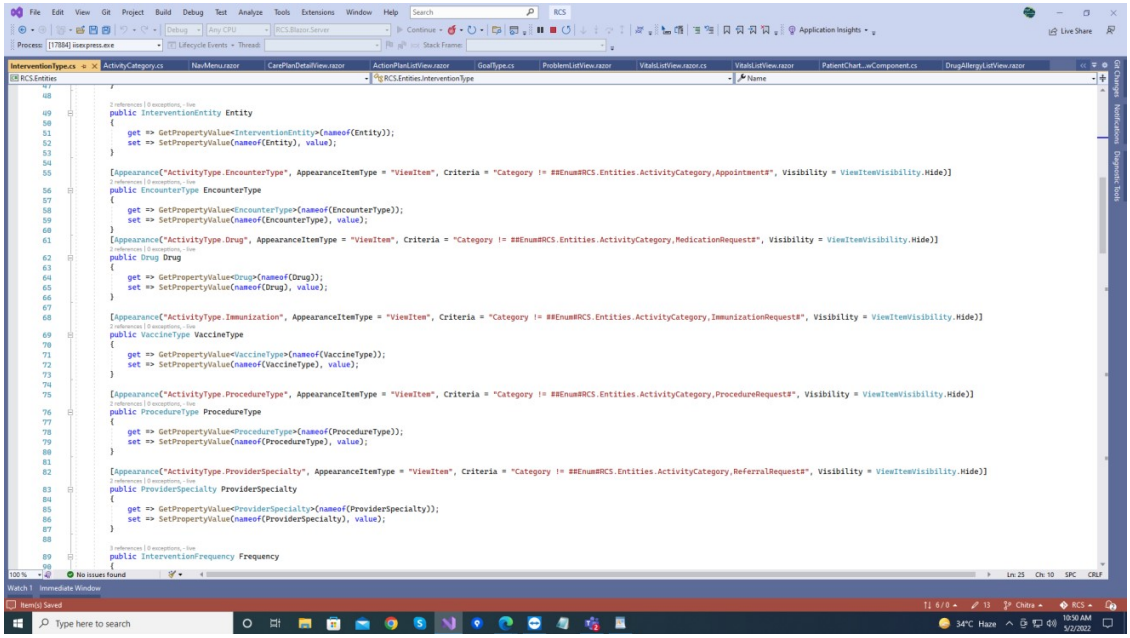
namespace RCS.Entities
{
    [NavigationItem(Constants.CustomizationEntityGroupName)]
    [ModelDefault("IsClonable", "True")]
    [ImageName("Menu Check")]
    [ModelDefault("Caption", "Action Plan Type")]
    [VirtualModule(RCSModuleType.CarePlanCustomizeFeatureName)]
    1 reference
    public class InterventionType : RCSObject
    {
        0 references | 0 exceptions, - live
        public InterventionType(Session session) : base(session)
        {
        }

        6 references | 0 exceptions, - live
        public string Name
        {
            get => GetPropertyValue<string>(nameof(Name));
            set => SetPropertyValue(nameof(Name), value);
        }

        3 references | 0 exceptions, - live
        public string Description
        {
            get => GetPropertyValue<string>(nameof(Description));
            set => SetPropertyValue(nameof(Description), value);
        }

        2 references | 0 exceptions, - live
        public InterviewQuestionLink InterviewQuestion
        {
            get => GetPropertyValue<InterviewQuestionLink>(nameof(InterviewQuestion));
            set => SetPropertyValue(nameof(InterviewQuestion), value);
        }

        [ImmediatePostData]
        2 references | 0 exceptions, - live
        public ActivityCategory Category
        {
```



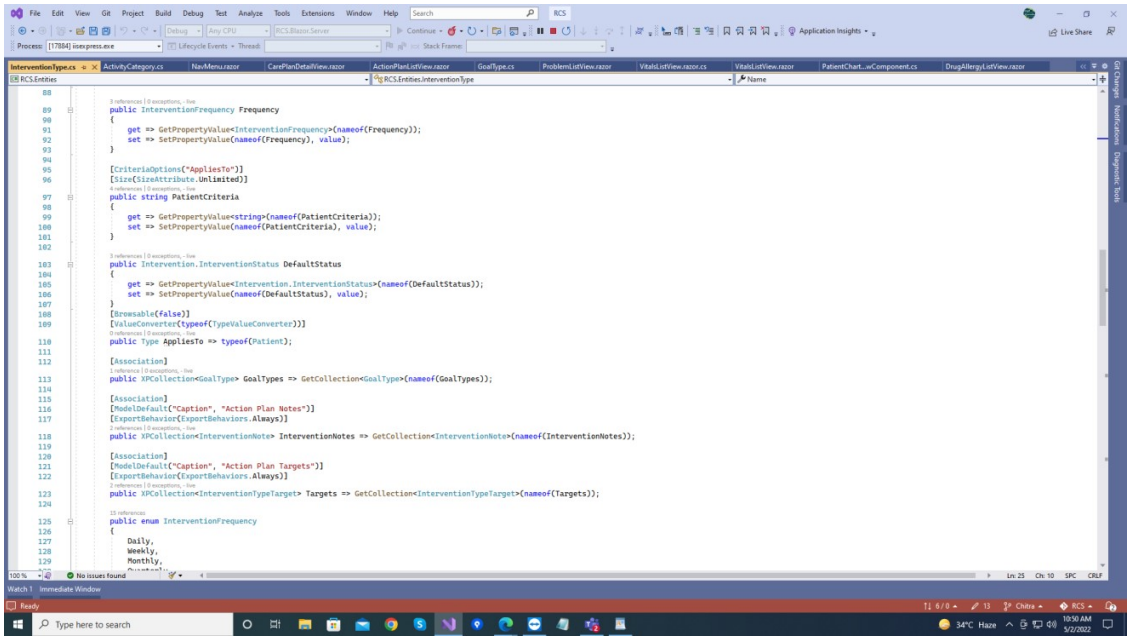
```
[Appearance("ActivityType.EncounterType", AppearanceItemType = "ViewItem", Criteria = "Category != ##Enum#RCS.Entities.ActivityCategory,Appointment#", Visibility = ViewItemVisibility.Hide)]
public EncounterType EncounterType
{
    get => GetPropertyValue<EncounterType>(nameof(EncounterType));
    set => SetPropertyValue(nameof(EncounterType), value);
}
[Appearance("ActivityType.Drug", AppearanceItemType = "ViewItem", Criteria = "Category != ##Enum#RCS.Entities.ActivityCategory,MedicationRequest#", Visibility = ViewItemVisibility.Hide)]
public Drug Drug
{
    get => GetPropertyValue<Drug>(nameof(Drug));
    set => SetPropertyValue(nameof(Drug), value);
}

[Appearance("ActivityType.Immunization", AppearanceItemType = "ViewItem", Criteria = "Category != ##Enum#RCS.Entities.ActivityCategory,ImmunizationRequest#", Visibility = ViewItemVisibility.Hide)]
public VaccineType VaccineType
{
    get => GetPropertyValue<VaccineType>(nameof(VaccineType));
    set => SetPropertyValue(nameof(VaccineType), value);
}

[Appearance("ActivityType.ProcedureType", AppearanceItemType = "ViewItem", Criteria = "Category != ##Enum#RCS.Entities.ActivityCategory,ProcedureRequest#", Visibility = ViewItemVisibility.Hide)]
public ProcedureType ProcedureType
{
    get => GetPropertyValue<ProcedureType>(nameof(ProcedureType));
    set => SetPropertyValue(nameof(ProcedureType), value);
}

[Appearance("ActivityType.ProviderSpecialty", AppearanceItemType = "ViewItem", Criteria = "Category != ##Enum#RCS.Entities.ActivityCategory,ReferralRequest#", Visibility = ViewItemVisibility.Hide)]
public ProviderSpecialty ProviderSpecialty
{
    get => GetPropertyValue<ProviderSpecialty>(nameof(ProviderSpecialty));
    set => SetPropertyValue(nameof(ProviderSpecialty), value);
}

public InterventionFrequency Frequency
{
```



```
public InterventionFrequency Frequency
{
    get => GetPropertyValue<InterventionFrequency>(nameof(Frequency));
    set => SetPropertyValue(nameof(Frequency), value);
}

[CriteriaOptions("AppliesTo")]
[Size(SizeAttribute.Unlimited)]
public string PatientCriteria
{
    get => GetPropertyValue<string>(nameof(PatientCriteria));
    set => SetPropertyValue(nameof(PatientCriteria), value);
}

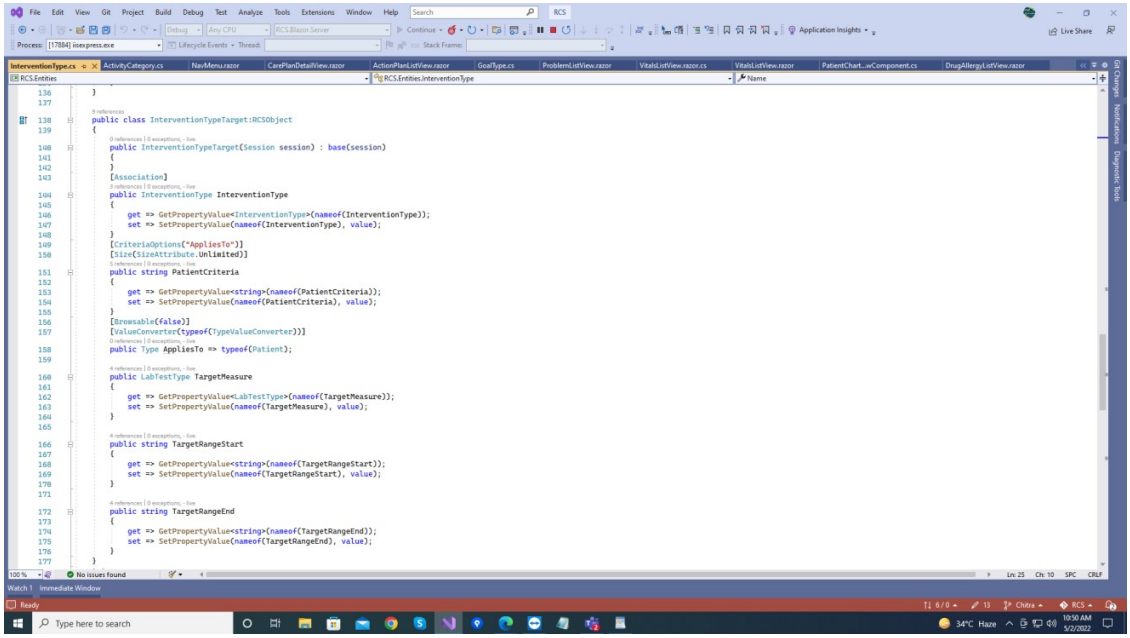
public Intervention.InterventionStatus DefaultStatus
{
    get => GetPropertyValue<Intervention.InterventionStatus>(nameof(DefaultStatus));
    set => SetPropertyValue(nameof(DefaultStatus), value);
}
[Browsable(false)]
[ValueConverter(typeof(TypeValueConverter))]
public Type AppliesTo => typeof(Patient);

[Association]
public XPCollection<GoalType> GoalTypes => GetCollection<GoalType>(nameof(GoalTypes));

[Association]
[ModelDefault("Caption", "Action Plan Notes")]
[ExportBehavior(ExportBehaviors.Always)]
public XPCollection<InterventionNote> InterventionNotes => GetCollection<InterventionNote>(nameof(InterventionNotes));

[Association]
[ModelDefault("Caption", "Action Plan Targets")]
[ExportBehavior(ExportBehaviors.Always)]
public XPCollection<InterventionTypeTarget> Targets => GetCollection<InterventionTypeTarget>(nameof(Targets));

public enum InterventionFrequency
{
    Daily,
    Weekly,
    Monthly,
```



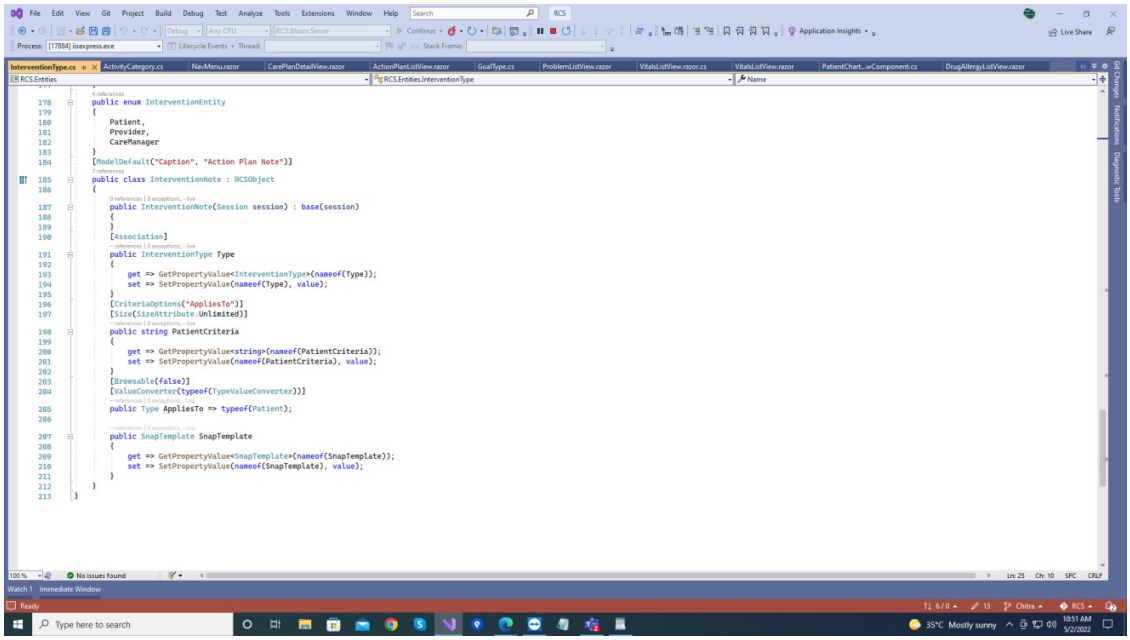
```
    }

    public class InterventionTypeTarget:RCSObject
    {
        public InterventionTypeTarget(Session session) : base(session)
        {
        }
        [Association]
        public InterventionType InterventionType
        {
            get => GetPropertyValue<InterventionType>(nameof(InterventionType));
            set => SetPropertyValue(nameof(InterventionType), value);
        }
        [CriteriaOptions("AppliesTo")]
        [Size(SizeAttribute.Unlimited)]
        public string PatientCriteria
        {
            get => GetPropertyValue<string>(nameof(PatientCriteria));
            set => SetPropertyValue(nameof(PatientCriteria), value);
        }
        [Browsable(false)]
        [ValueConverter(typeof(TypeValueConverter))]
        public Type AppliesTo => typeof(Patient);

        public LabTestType TargetMeasure
        {
            get => GetPropertyValue<LabTestType>(nameof(TargetMeasure));
            set => SetPropertyValue(nameof(TargetMeasure), value);
        }

        public string TargetRangeStart
        {
            get => GetPropertyValue<string>(nameof(TargetRangeStart));
            set => SetPropertyValue(nameof(TargetRangeStart), value);
        }

        public string TargetRangeEnd
        {
            get => GetPropertyValue<string>(nameof(TargetRangeEnd));
            set => SetPropertyValue(nameof(TargetRangeEnd), value);
        }
    }
```



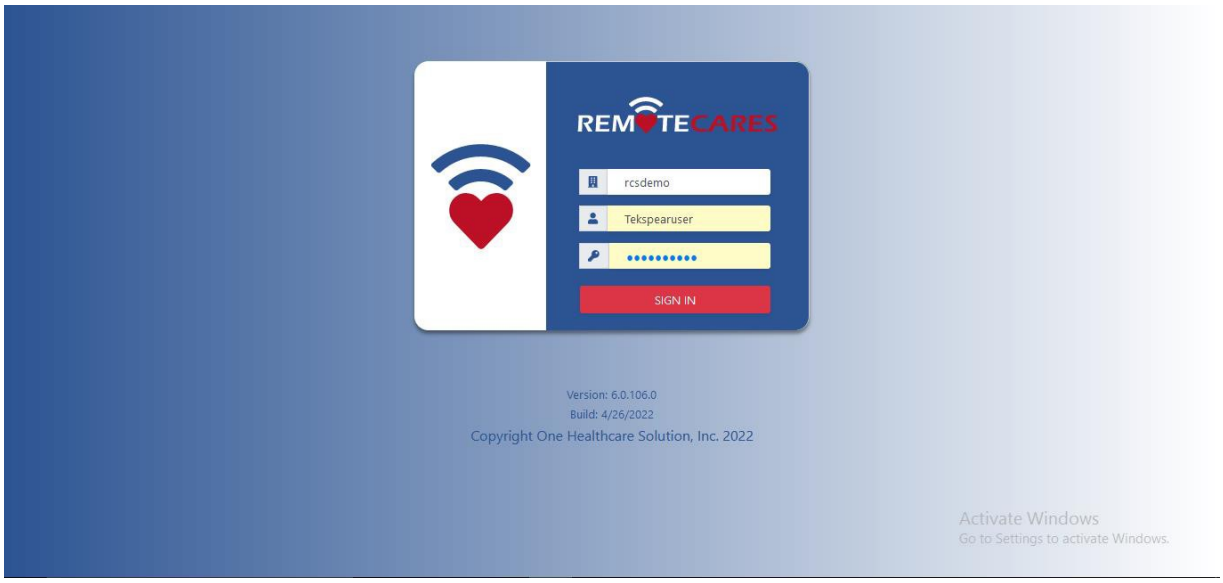
```
    public enum InterventionEntity
    {
        Patient,
        Provider,
        CareManager
    }
    [ModelDefault("Caption", "Action Plan Note")]
    public class InterventionNote : RCSObject
    {
        public InterventionNote(Session session) : base(session)
        {
        }
        [Association]
        public InterventionType Type
        {
            get => GetPropertyValue<InterventionType>(nameof(Type));
            set => SetPropertyValue(nameof(Type), value);
        }
        [CriteriaOptions("AppliesTo")]
        [Size(SizeAttribute.Unlimited)]
        public string PatientCriteria
        {
            get => GetPropertyValue<string>(nameof(PatientCriteria));
            set => SetPropertyValue(nameof(PatientCriteria), value);
        }
        [Browsable(false)]
        [ValueConverter(typeof(TypeValueConverter))]
        public Type AppliesTo => typeof(Patient);

        public SnapTemplate SnapTemplate
        {
            get => GetPropertyValue<SnapTemplate>(nameof(SnapTemplate));
            set => SetPropertyValue(nameof(SnapTemplate), value);
        }
    }
}
```

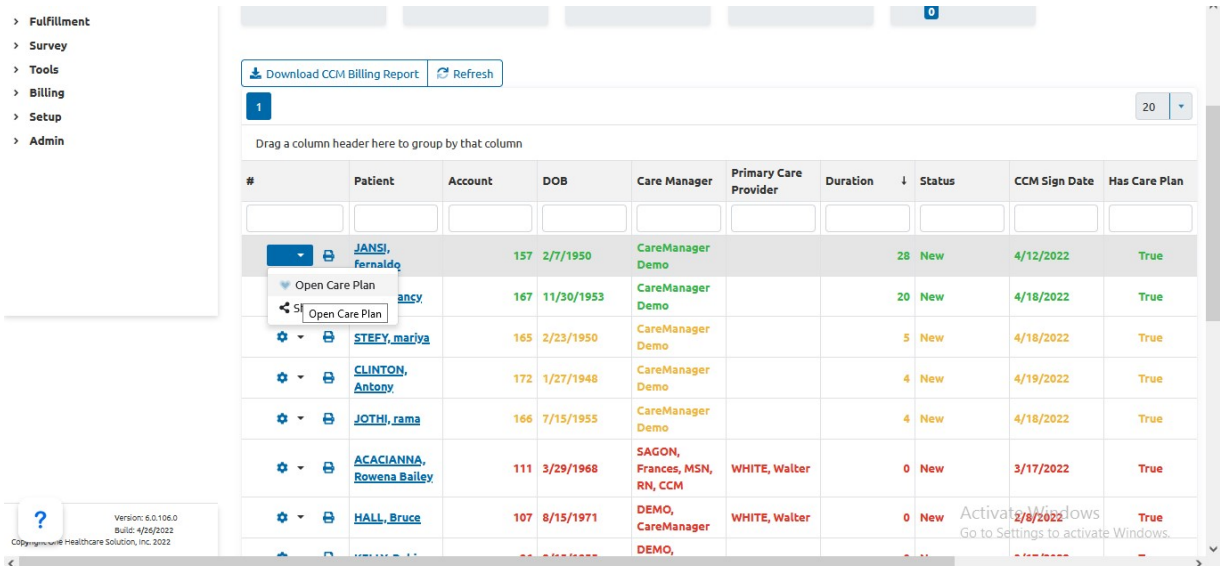
FORM DESIGN

FORM DESIGN

Login Page:

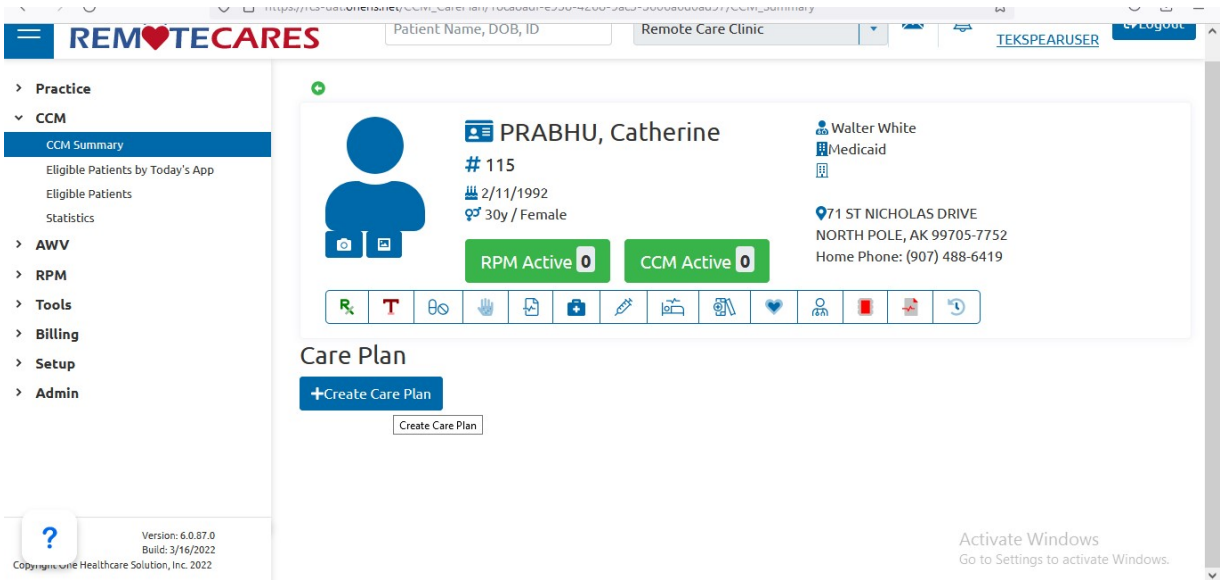


Patient Care Plan:

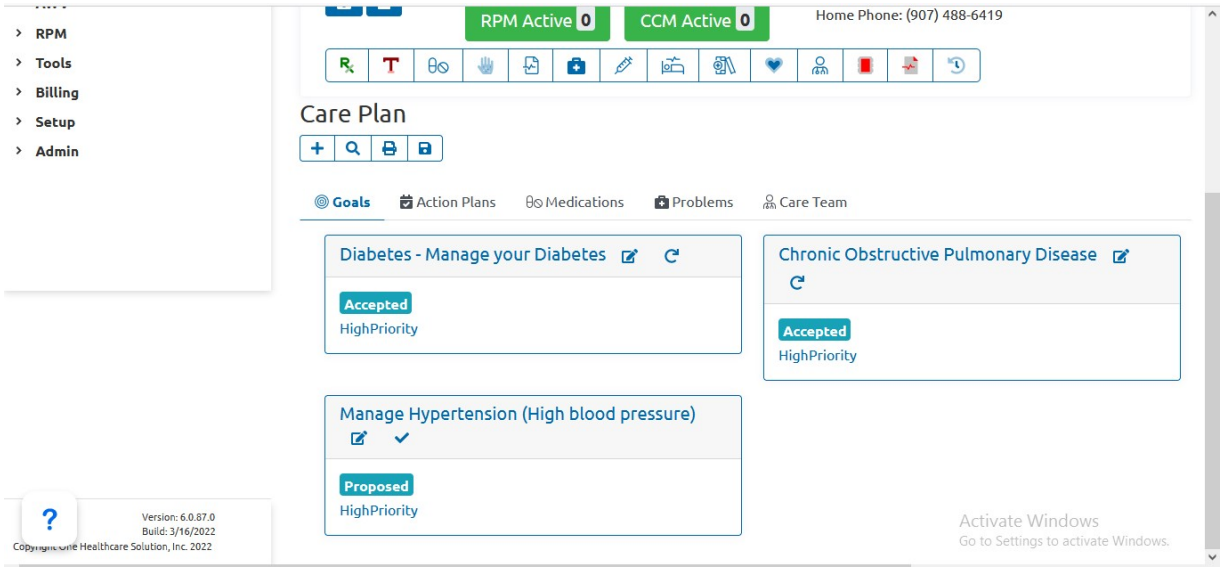


#	Patient	Account	DOB	Care Manager	Primary Care Provider	Duration	Status	CCM Sign Date	Has Care Plan
	JANSI, fernaldo	157	2/7/1950	CareManager Demo		28	New	4/12/2022	True
	ancy	167	11/30/1953	CareManager Demo		20	New	4/18/2022	True
	STEFY, mariya	165	2/23/1950	CareManager Demo		5	New	4/18/2022	True
	CLINTON, Antony	172	1/27/1948	CareManager Demo		4	New	4/19/2022	True
	JOTHI, rama	166	7/15/1955	CareManager Demo		4	New	4/18/2022	True
	ACACIANNA, Rowena Bailey	111	3/29/1968	SAGON, Frances, MSN, RN, CCM	WHITE, Walter	0	New	3/17/2022	True
	HALL, Bruce	107	8/15/1971	DEMO, CareManager	WHITE, Walter	0	New	2/8/2022	True

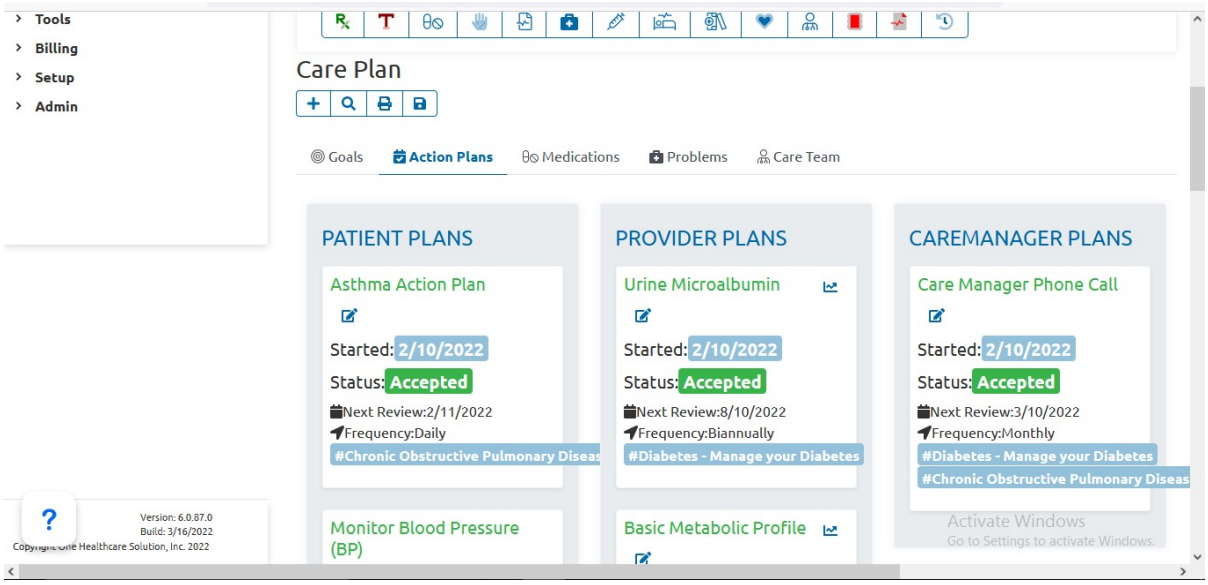
Create Care Plan:



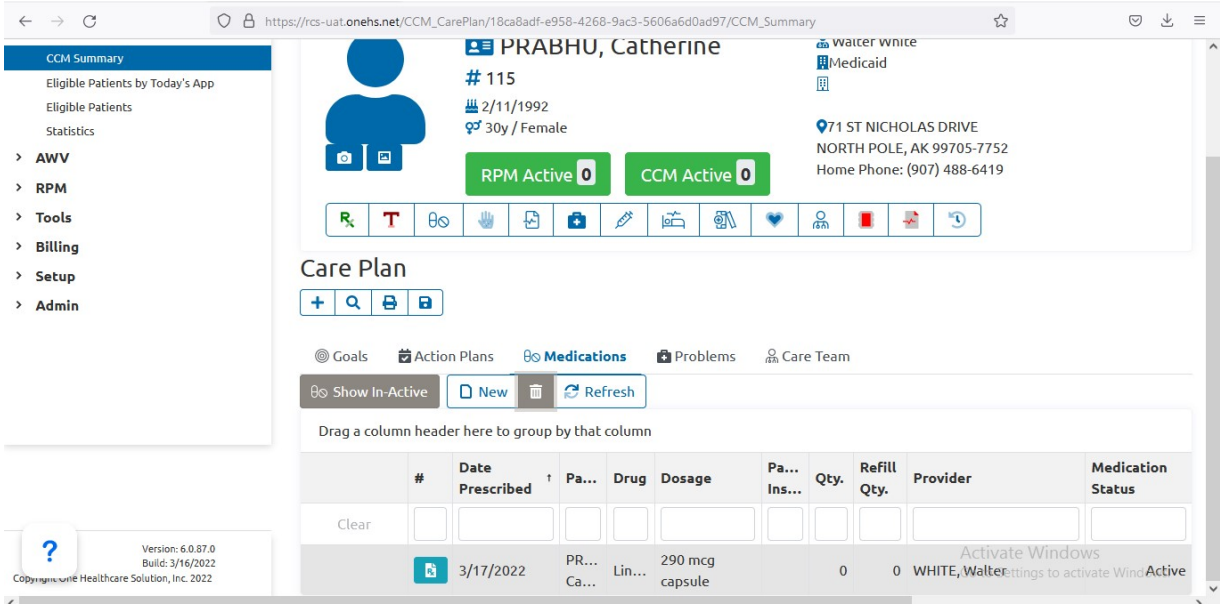
Goals:



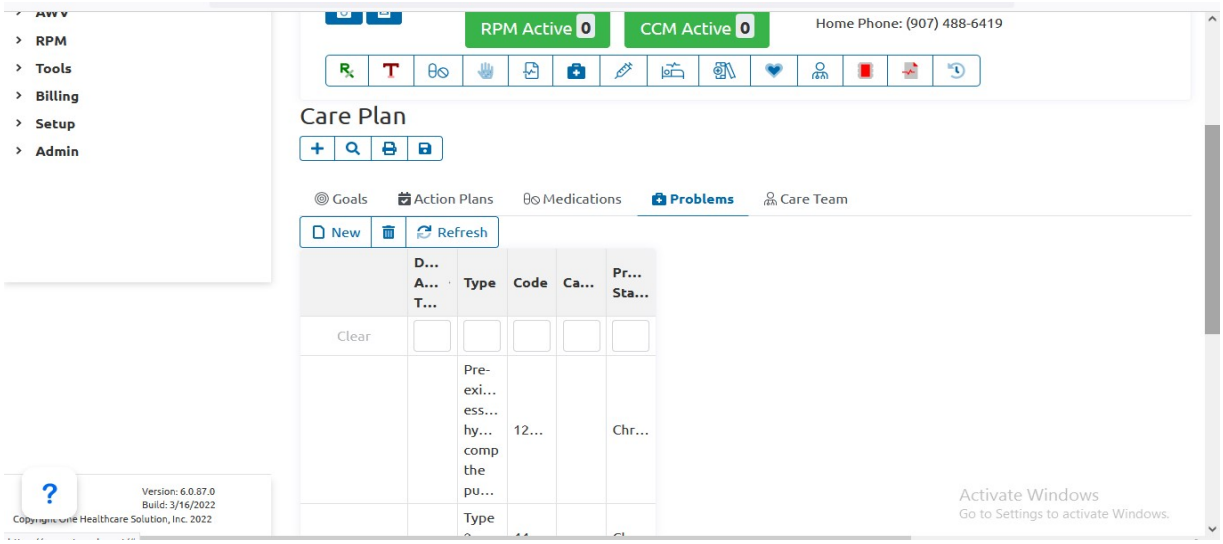
Action Plan:



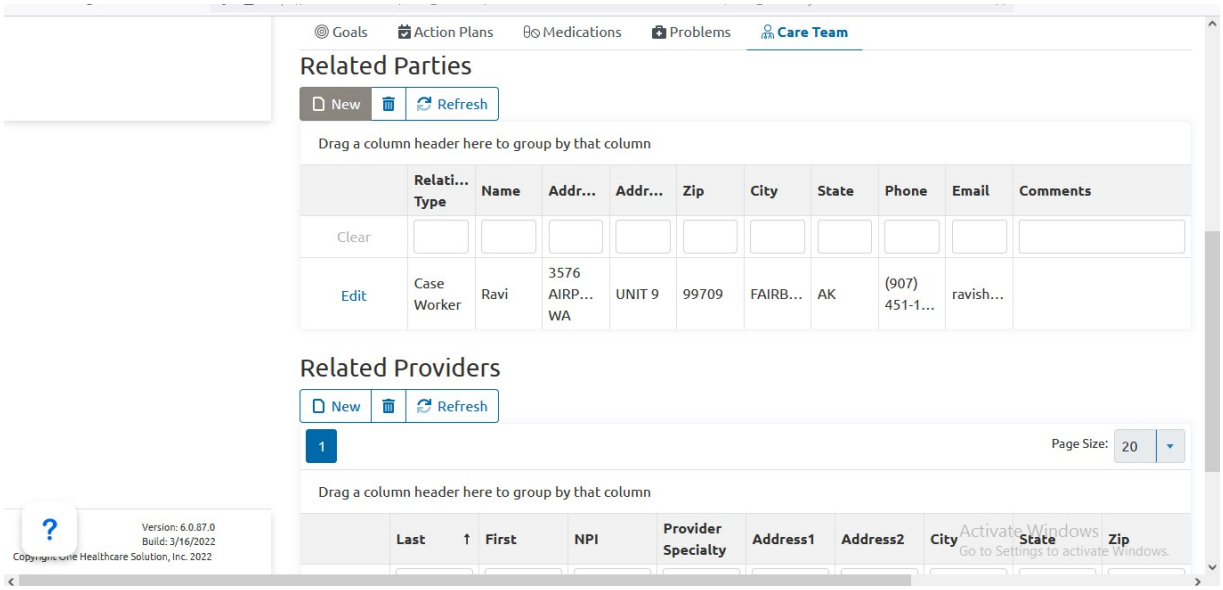
Medications:



Problems:



Care Team:



CONCLUSION

CONCLUSION

A patient care plan helps nurses and other care team members organize aspects of patient can according to a timeline**.** Patient care plan organizations can use the relevant variables and factors, identified from the study, to formulate their strategies and plans in the country. The organizations can prioritize the patient implicit and explicit requirements in Patient care plan. Patient care plan provide continuity of care, safety, quality care and compliance. A patient care plan promotes documentation and is used for reimbursement purposes such as medicare and Medicaid. Care Plans usually combine disease management for patients with common chronic conditions with case management for high-risk members, regardless of the underlying condition.

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FUTURE ENHANCEMENT

FUTURE ENHANCEMENT

Software features change day by day. We do have a list of enhancements that would add more value to this project they are, we need a Patient centric mobile application. So that the patient can communicate back and forth about the progress of the goals and action plans.SMS integration to send action plan notifications Automated Work flow implementation for goal and action plan progress update Tele-calling integration for advanced care.

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BIBLIOGRAPHY

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VEHICLE LOAN AND RTO SERVICE SYSTEM

A project Submitted to

ST. MARY'S COLLEGE (AUTONOMOUS), THOOTHUKUDI.

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY,

TIRUNELVELI

in partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

JUMANA TAKCINA BANU. J

Reg. No.: 20SPCS07

Under the Supervision and Guidance of

Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D.,

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi-628001

MAY 2022

CERTIFICATE

This is to certify that this project work entitled "**VEHICLE LOAN AND RTO SERVICE SYSTEM**" is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to **MANONMANIAM SUNDARANAR UNIVERSITY**, **TIRUNELVELI,** in partial fulfillment for the award of the Degree of Master of Science in COMPUTER SCIENCE for the work done during the year 2021-2022 by **JUMANA TAKCINA BANU. J (REGNO: 20SPCS07).**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do hereby declare that the project entitled "**VEHICLE LOAN AND RTO SERVICE SYSTEM**" submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D.,** Assistant Professor, PG Department of computer Science (SSC), St.Mary's College (Autonomous), Thoothukudi.

Station: Thoothukudi **Signature of the student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Joshpine Jeyarani, Director of SSC, St. Mary's College(Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms.C.Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and Co-ordinator, PG Computer Science(SSC), for her support and counsel.

I express my hearty thanks to my guide Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D., Assistant professor, PG Department of computer science (SSC) for her valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to Ms. A. Jenitta Jebamalar M.Sc(IT)., M.Sc(CS)., M.Phil., B.Ed., Assistant Professor, PG Department of Computer Science(SSC), for her kind cooperation in successful completion of the project.

I am much indebted to Dr. P. Johnson Durai Raj for his untiring effort, immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

ABSTRACT

The Online portal for the finance agencies provides loan to the customer by picking information necessary from the customers which was verified to provide loan and passes the approval for loan to the customer. My project "**VEHICLE LOAN AND RTO SERVICE SYSTEM**" provides Vehicle Loan and RTO Service that reduces the customer burden. This system provides Vehicle loan with loan approval verification to accept/reject customer's file. It tracks the status from time to time. It helps not only the customer but also loan agency to check the pending, complete the formalities and arrive at decision in addition to providing transparency system for everyone.RTO Information system is an Online Information Source developed for Regional Transport office (RTO) to facilitate the customers in applying for various license and registration. This project interface has been designed to facilitate this process within the organization.RTO provides facility like applying license online, issuance of permanent license, tax challans etc. Thus the vehicle loan and RTO service system helps to simplify the process along with reducing the time effort and burden in addition with making the work easy.

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1. INTRODUCTION

Vehicle loan and RTO Service System is an online information source to facilitate the flow of information within the organization by admin to manage loan and RTO services. Loan portfolio problems have historically been the main issue for the danger of possible loan losses. The present system could be a manual system that maintain details with proper security and can track details easily and also contain functionalities of fast retrieval information, like customer details, maintenance of all the loan details.

System can make the daily activities efficient and fast by using add, edit, find customer details, it maintain and issue new loan, modify loan rate. The scope of this project is to provide loan in a very smart way. This project is arranged to beat many problems like data redundancy, data incorrectness, time consuming, etc. This project has been designed to online the back office activities of finance company which offers any type of loan, Admin manage customer information database more efficiently, Loan details, maintain loan type and interest rate information. Admin can use this project to give exact payable loan amount for the customer & generate all these work information as a report of each customers. This technique is intended to simply the info of the loan customers. This technique is formed to stay the records about the customers who have taken a loan from a agency. Daily many new customers visit the bank, so adding the new customer's details and keeping the records using this system is very easy. There are many other options also like sending SMS, view Remainder, adding new accounts etc. There also are the choices to test the customer's loan amount, rate and therefore the unpaid amount. Amount paid by any customer or may be saved thereon and it's easy to calculate daily that the money is collected.

Admin can check the main points of their customers like if any customer has not paid the monthly amount from the last three months. It is easy to calculate money and handle account on monthly basis also. This technique also has an choice to use the backup, which means if we are backing up the database it can never be lost. So, overall this vehicle loan and RTO service system could be a solution to all or any the issues that we face in a very industry.RTO Service System keeps track of the Customers in the finance company. It maintains Renewal of learner's License, Renewal of permanent license, Issue of learner's license, Registration Form, Issue of permanent license, and finally it produce printouts to payment of customers.

2. SYSTEM SPECIFICATION

HARDWARE REQUIREMENTS

- **Hard Disk** : 40GB TO 90GB
- **Processor** : Pentium IV 2.4GHz
- **System Type** : 32bit / 64 bit
- **RAM** : 4GB
- **OS** : WINDOWS 10

SOFTWARE REQUIREMENTS

- **FRONT END** : PHP
- **BACK END** : MYSQL Database
- **SERVER LANGUAGE** : XAMP
- **OPERATING SYSTEM** : Windows 10
- **BROWSER** : Google Chrome

PHP

PHP is a general-purpose scripting language geared toward web development. It was originally created by Danish-Canadian programmer Rasmus Lerdorf in 1994. The PHP reference implementation is now produced by The PHP Group. PHP originally stood for Personal Home Page, but it now stands for the recursive initialism PHP: Hypertext Preprocessor.

PHP code is usually processed on a web server by a PHP interpreter implemented as a module, a daemon or as a Common Gateway Interface (CGI) executable. On a web server, the result of the interpreted and executed PHP code which may be any type of data, such as generated HTML or binary image data would form the whole or part of an HTTP response. Various web template systems, web content management systems, and web frameworks exist which can be employed to orchestrate or facilitate the generation of that response. Additionally, PHP can be used for many programming tasks outside the web context, such as standalone graphical applications and robotic drone control. PHP code can also be directly executed from the command line.

MySQL

- MYSQL is the most popular Open Source SQL database management system, it is developed, distributed, and supported by Oracle Corporation.
- MYSQL was developed by Michael widenius and Dravid Axmark
- The SQL part of MYSQL stands for "Structured Query Language"
- In MYSQL database is a structured collection of data.
- MYSQL is an open source it means that it is possible for anyone to use and modify the software.
- Anybody can download the MYSQL software from the Internet and use it without paying anything.
- MYSQL server can run comfortably on the desktop or laptop, alongside your other applications, web servers, and so on, requiring little or no attention.
- MYSQL can also scale up to clusters of machines, networked together.
- MYSQL support 50 million rows or more in a table. The default file size limit for a table is 4GB but it can be increased to a theoretical limit of 8 million terabytes.
- MYSQL is presently developed, distributed and supported by oracle corporation.
- It has been widely used by the web developers to develop web applications.
- MYSQL server design is multi-layered with independent modules.

3. PROJECT DESCRIPTION

In this Vehicle Loan and RTO Service System project, modules will be developed in PHP source code and MYSQL databases.

OBJECTIVES

- Fast, secure, convenient and free.
- Quick, simple, authenticated access to accounts via the web application.
- Simply scalable to grow with changing system requirement.
- Global enterprise wide access to information.
- Improved data security, restricting unauthorized access.
- Minimize Storage Space.

This Project is made of single mode of login.

Admin Login

Admin can login the system with his user name and password. He can change password and also he can manage loan type and interest rate in the system. He can maintain information and details to the customer such as customer name, address, contact no, bank account no, pan no, email id, etc. Only Admin can manage customer record. He can manage loan details such as Loan no, loan type, Loan Amount, loan tenure, interest rate, Issue date etc. for the customer. He can calculate and manage EMI details.He can manage at the time of receiving EMI which contains details of given an EMI and the EMI that are remain in future to get next time of customer. He can notify and communicate with the customers using SMS module.

4. MODULE DESCRIPTION

Loan

In this module admin can do the following operations,

- Add Loan
- View Loans
- Due Chart Entry
- Due paid Entry

Add Loan

Admin can add a new loan for a customer using this module. In this module admin has to enter the Loan Details, Loan Holder Details, Guarantee Details, Vehicle Details Entry, Vehicle Details upload. In each step admin has to fill all the required details to open a new loan process for a customer.

View Loans

Once the admin created an account for a customer he can view all the loan details in this page. He can view all the customer's loan details in a table form. He can edit button to do any changes for a customer details. Search box is available to view a particular customer. In this page he can also add a new loan for a customer.

Due Chart Entry

In this page admin can search a particular customer using search key. He can view the due chart of a customer loan using view due chart button. Already paid loan amount of a customer can be viewed using view due paid button. All the loan details of a customer can be viewed using view loan summary report.

Due paid entry

In this module admin can view all the paid loan amount of a customer and he can see the time period of amount paid. He can add new due entry for a customer's loan. overdue chart and overdue paid will be displayed below. Due charts can be edited using Edit Due charts and the whole process will be displayed in the view loan summary report.

Report

Admin can use these modules in this page for the loan report process

- Loan Summary
- Due Collection Report
- Pending Report
- Ledger Report

Loan summary

In this page admin can use the search key to view a particular customers loan details. View details button will display all the details of the loan process made of a customer.

Due Collection Summary

Collected due amount of a customer will be displayed in this page. All the due information of the loan will be stored here.

Pending report

Admin can use this module to view the pending due amount which is not paid by the customer. He can view a particular customer pending report using the search key box.

Ledger report

Any customer's loan details can be viewed in this page. Opening balance and closing balance will be displayed that can be printed.

Transactions

Admin can view the transaction process of a loan using these modules.

- Debit
- Credit

Debit

In debit page admin has to choose the money to be paid account for transactions and he can view the details of it. He can also add new payment entry here. Payment history will be displayed below.

Credit

In credit page admin has to choose the account that is to get the amount for transaction and he views the details of it. He can also add new receipt entry of a customer's loan. Receipt history will be displayed below

Accounts Master

In account master page, admin has to select the financier name to view the account details of a financier. Once selected a financier account all the data collected before will be displayed. He can add a new financier account using add new button. These modules are available to maintain the financier information.

- Financier Details
- Internal Account Details
- Other Account Details

Financier Details

In financier details admin can do two operations:

- Add Financier Account
- Add Financier

Add Financier Account

Admin has to enter the account name and account description to create a new account for a financier. He can view all the financier account that is created before

Add Financier

Admin can save an entry of a financier using this module. He can view all the details of a particular financier by selecting a financier.

Internal Account Details

Admin can view internal account of a financier by selecting a financier name. Admin can add a new internal account using add new account

Add Internal Account

In this page admin can add a new internal account for financier. He can also view all the internal account of a financier using view all button.

Other Account Details

Admin can select the other account type to view other account details. Selected account will be displayed below.

Add Other Account

Admin can submit other account entry in this page. He can view all the account using view all button.

SMS

Admin can use this page in the following ways.

- SMS Template
- Send SMS

SMS Template

Using this moduleadmin can create a new template messages. Created templates will be displayed below

Send SMS

In this module admin can select a customer to send SMS.

Remainders

Remainder module allows admin to do this action

- View Remainder

View Remainder

Admin have to select the remainder date, Financier Name, Loan Type and remind me button will save the process. Remainders will be displayed below.

RTO Services

This module allows admin to do these functions

- Add Customers
- View Customers
- Customer Remainder
- Pending Report
- Customer Debit
- Customer Credit

Add Customers

This module allows admin to add new customers for RTO services. Customer details, vehicle Details Entry and Vehicle Details upload have to be filled by the admin to create a new account for a customer.

View Customers

In this module admin can view all the existing customers. He can edit customer's details. He can duplicate the copy of it. He can delete any customers.

Customer Remainder

Admin can use this module to remind the customer when RTO services expired.

Pending Report

This modules is use to view the pending reports of a particular date. Using this module admin can able to view the balance amount of customers.

Customer Debit

In debit page admin has to choose the money to be paid account for transactions and he can view the details of it. He can also add new payment entry here. Records will be displayed below.

Customer Credit

In credit page admin has to choose the account that is to get the amount for transaction and he views the details of it. He can also add new receipt entry of a customer's loan. Records will be displayed below.

8.Settings

This module is use to update the technique by the admin. This module contains of

- Loan Types
- Change Password
- Backup

Loan Types

Using this module admin can add new loan type. He can select the particular loan to view or edit it. All t he existing loan types will be displayed below

Change Password

Admin can change his password anytime he wants.

Backup

Admin can backup this technique whenever he needs.

5. DATABASE DESCRIPTION

loan_type

Name	Type
loantype_id	int(11)
loantype_name	varchar(1000)
description	mediumtext
del_flg	int(11)

financier_account

Name	Type
Fin_id(primary key)	int(11)
acc_name	varchar(1000)
description	mediumtext
financier_name	varchar(1000)
financier_address	mediumtext
del_flg	int(11)

due_entry

Name	Type
id(primary key)	int(11)
loan_id	varchar(50)
Due_id	varchar(100)
Due_type	Varchar(50)
Due_date	varchar(50)
amount	decimal(19,4)
remarks	mediumtext
del_flg	int(11)

account_financier

Name	Type
id(primary key)	int(11)
acc_id	varchar(500)
Fin_id	int(11)
acc_name	varchar(1000)
description	mediumtext
financier_name	varchar(1000)
financier_address	mediumtext

account_internal

Name	Type
id(primary key)	int(11)
acc_id	varchar(500)
acc_name	varchar(1000)
description	mediumtext

account_others

Name	Type
id(primary key)	int(11)
acc_id	varchar(25)
acc_name	varchar(1000)
description	mediumtext
phone_no	varchar(50)
acc_type	int(11)
del_flg	int(11)

6. SYSTEM STUDY

EXISTING SYSTEM

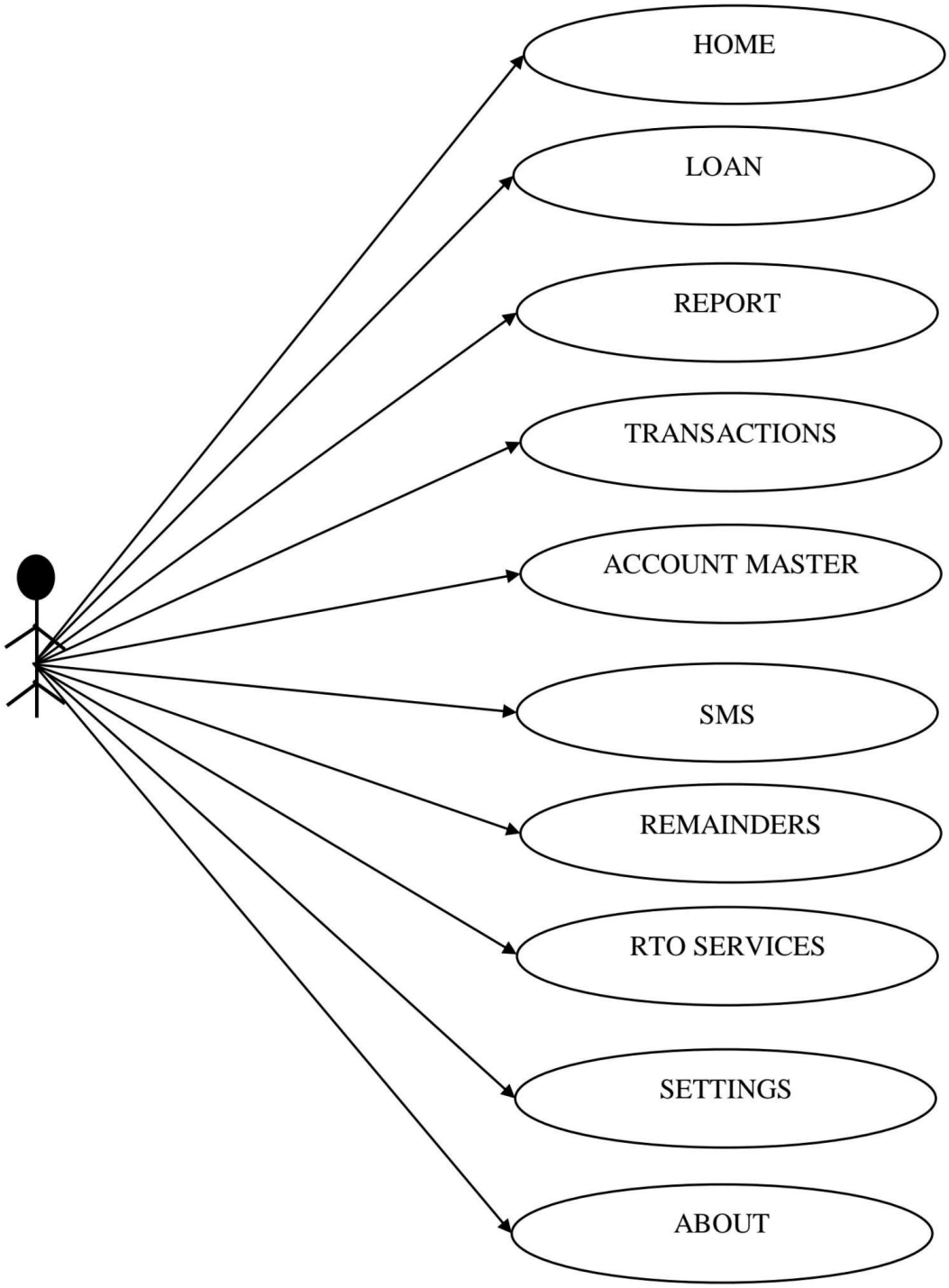
- Here the existing system is a manual that doesn't maintain details with proper security and can't track details easily.
- Existing system doesn't contain functionalities of fast retrieval information such as customer details and maintenance of all the loan details so it involves lots of paperwork.
- Doesn't user-friendly interface.
- Lots of time is required to manage customer info & details so it feels that existing system not accurate and therefore maintenance becomes very complicate.
- It used to take more time to find customers because there is required extra manual effort.
- Difficulty in generating different reports as per the business requirement

PROPOSED SYSTEM

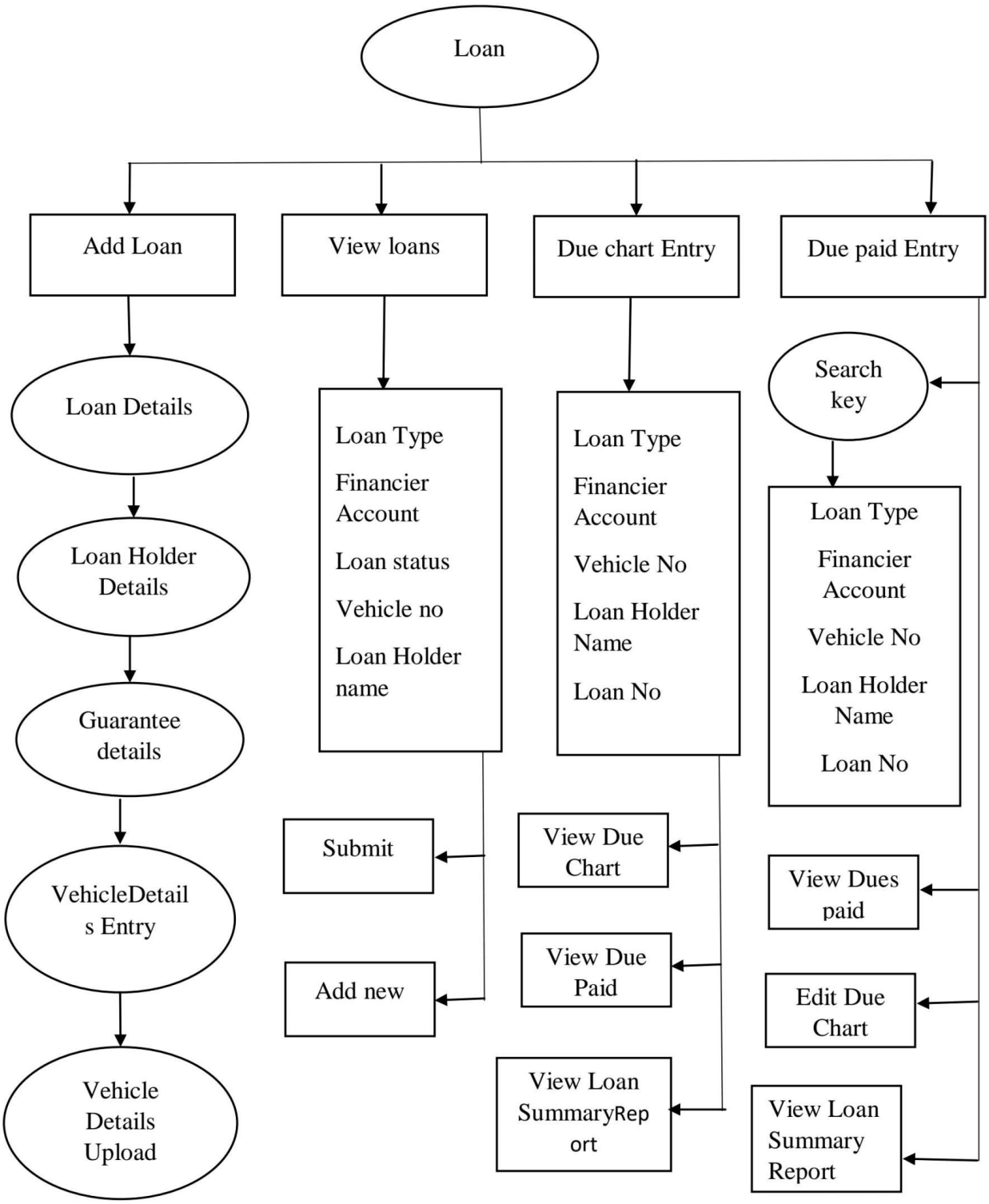
- Interest rates and the loan details are also available at the click of a mouse.
- This system provides detail about the customers, their loan details, EMI details and its rate details.
- System provides download option to download different type of loan form in MS word document
- Using with this system admin can find customer easily and it's a paperless system so workload is reduced.
- The decision process becomes faster and more consistent
- After login admin can use the system easily and also he can view any query about loan details as well as EMI details. So this system saves time.
- In this system there are used EMI (Equated Monthly Instalment) calculators.
- Provides a facility to generate the report very easily

7. SYSTEM DESIGN

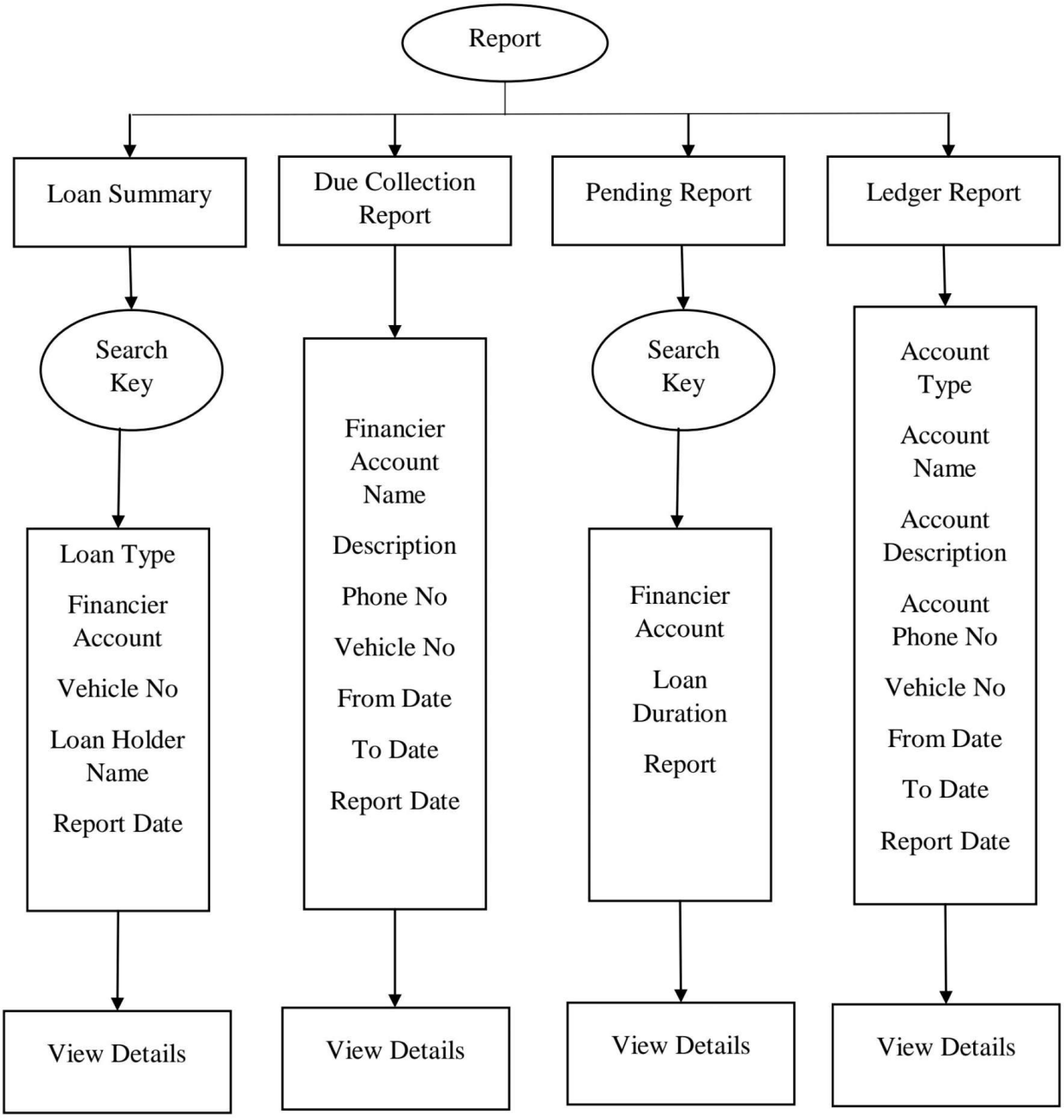
Admin login



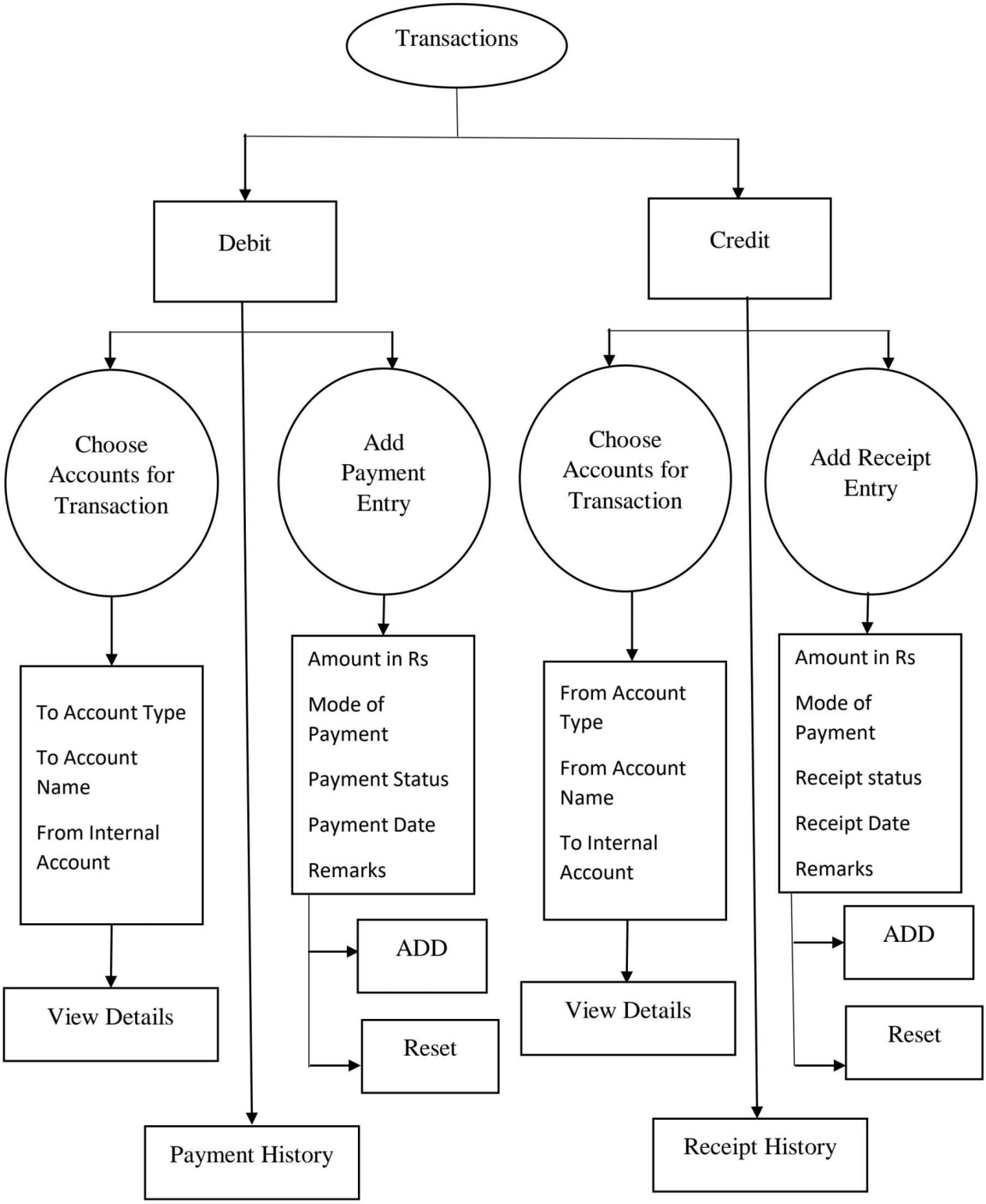
Loan page


Loan
Add Loan
View loans
Due chart Entry
Due paid Entry
Loan Details
Loan Holder Details
Guarantee details
VehicleDetail s Entry
Vehicle Details Upload
Loan Type
Financier Account
Loan status
Vehicle no
Loan Holder name
Submit
Add new
Loan Type
Financier Account
Vehicle No
Loan Holder Name
Loan No
View Due Chart
View Due Paid
View Loan SummaryRep ort
Search key
Loan Type
Financier Account
Vehicle No
Loan Holder Name
Loan No
View Dues paid
Edit Due Chart
View Loan Summary Report

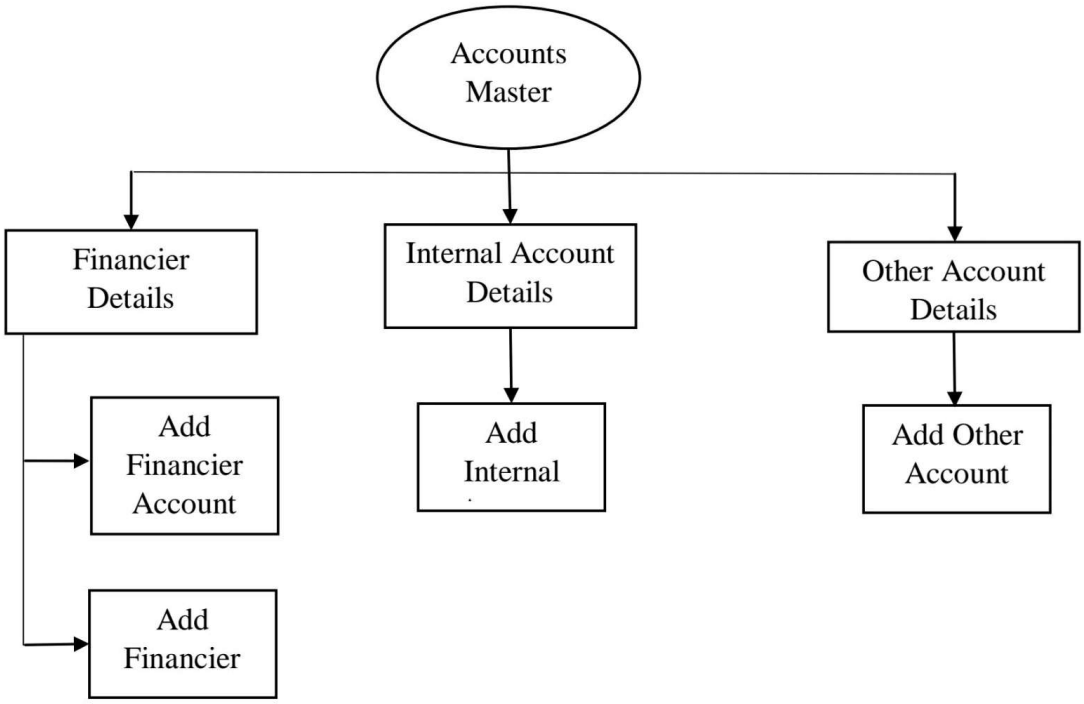
Report page


Report
Loan Summary
Due Collection Report
Pending Report
Ledger Report
Search Key
Search Key
Loan Type
Financier Account
Vehicle No
Loan Holder Name
Report Date
Financier Account Name
Description
Phone No
Vehicle No
From Date
To Date
Report Date
Financier Account
Loan Duration
Report
Account Type
Account Name
Account Description
Account Phone No
Vehicle No
From Date
To Date
Report Date
View Details
View Details
View Details
View Details

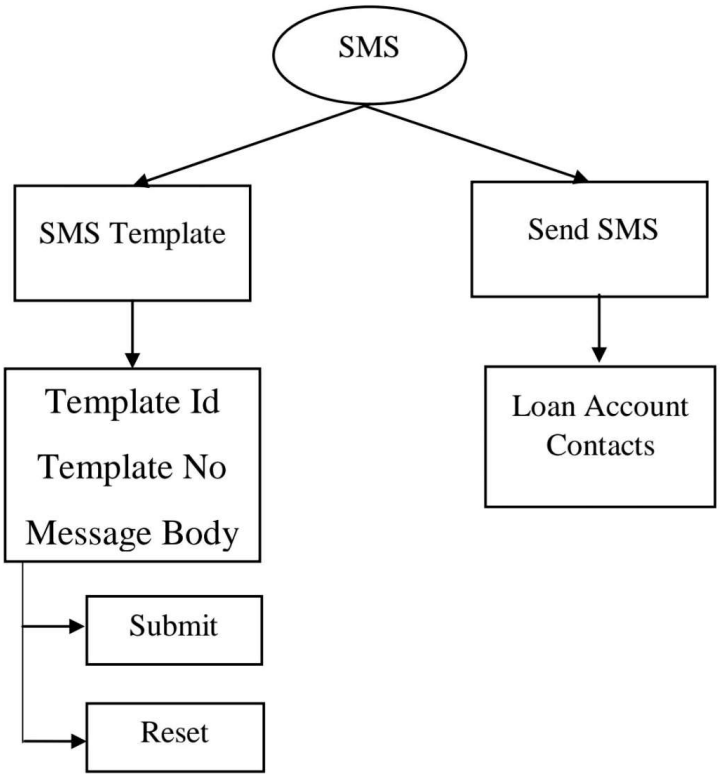
Transactions Page



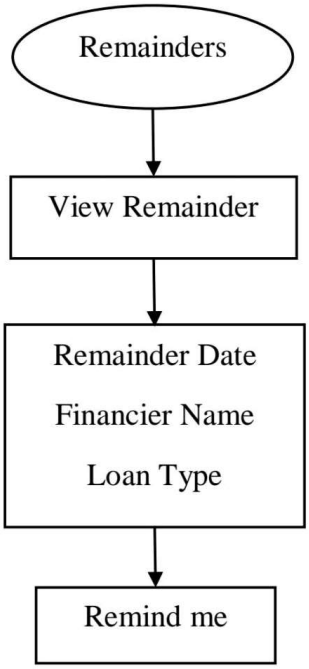
AccountsMasterpage



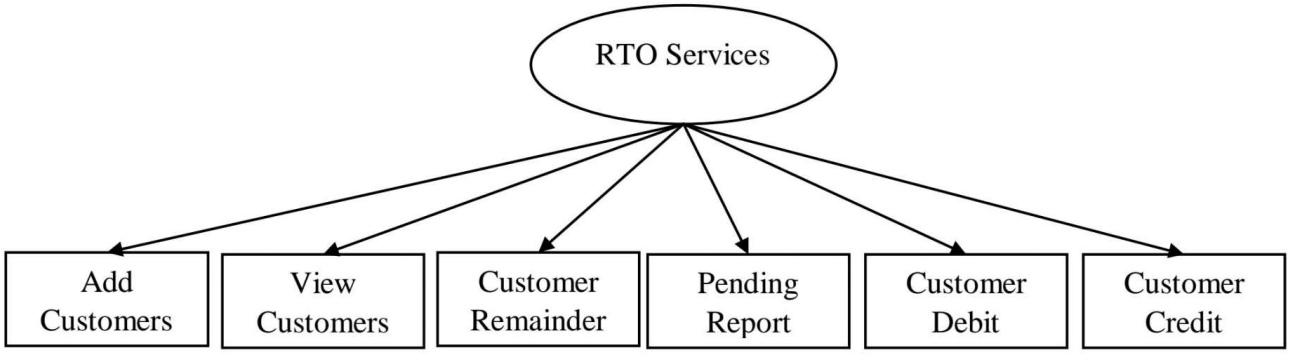
SMSpage



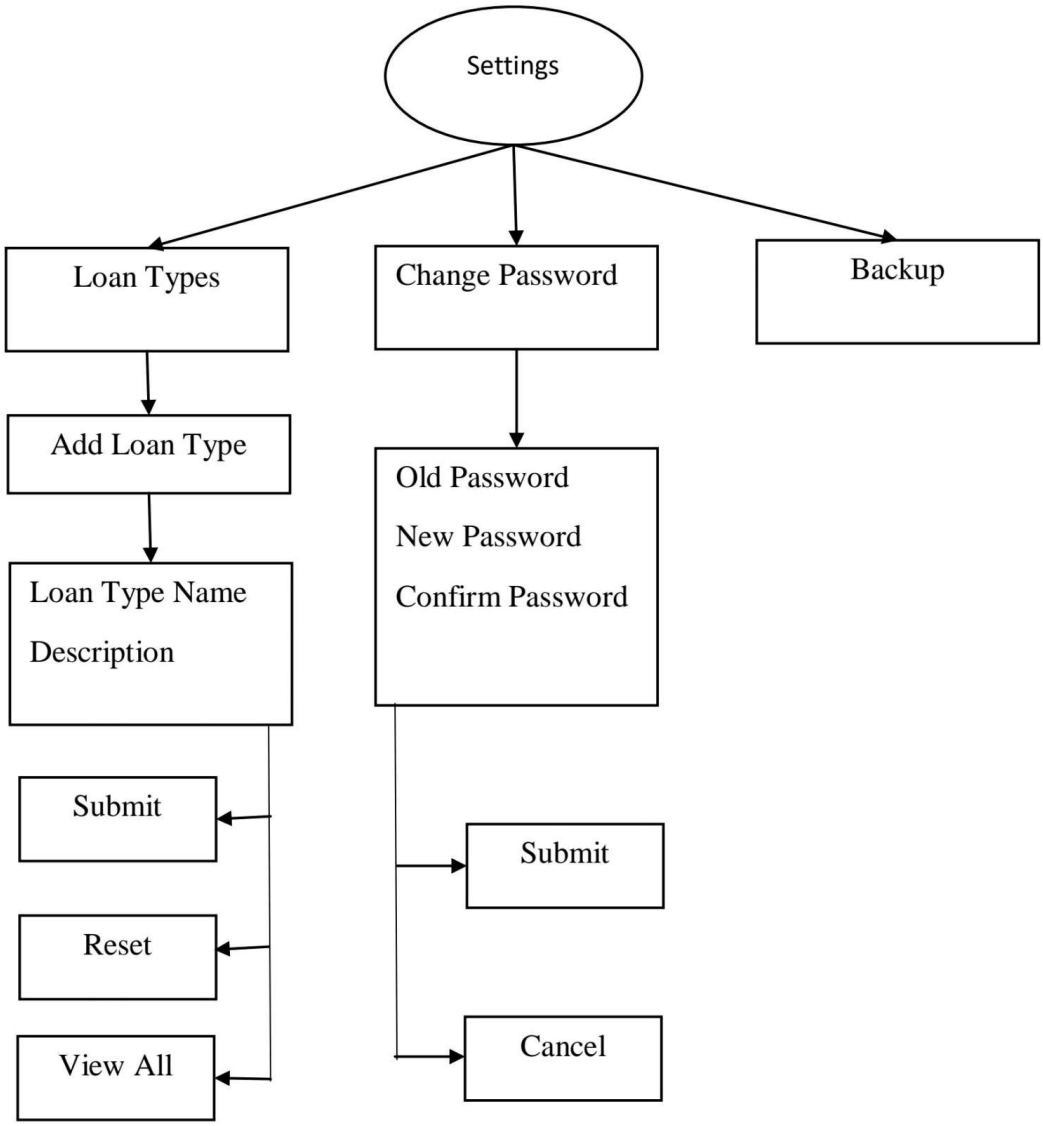
Remainders



RTO Services page



Settings page



8. CODING

index.php

```
<!doctype html>
 <html xmlns="http://www.w3.org/1999/xhtml">
 <head>
 <link rel="icon"  href="../../../images/img/logo3.png" />
  <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
  <meta name="viewport" content="initial-scale=1.0" />
  <meta name="format-detection" content="telephone=no" />
  <title>JJ Auto Finance - About</title>
  <style type="text/css">
        body {
                width: 100%;
                margin: 0;
                padding: 0;
                -webkit-font-smoothing: antialiased;
        }
        @media only screen and (max-width: 600px) {
                table[class="table-row"] {
                        float: none !important;
                        width: 98% !important;
                        padding-left: 20px !important;
                        padding-right: 20px !important;
                }
                table[class="table-row-fixed"] {
                        float: none !important;
                        width: 98% !important;
                }
                table[class="table-col"], table[class="table-col-border"] {
                        float: none !important;
                        width: 100% !important;
                        padding-left: 0 !important;
                        padding-right: 0 !important;
                        table-layout: fixed;
                }
                td[class="table-col-td"] {
                        width: 100% !important;
                }
                table[class="table-col-border"] + table[class="table-col-border"] {
                        padding-top: 12px;
                        margin-top: 12px;
                        border-top: 1px solid #E8E8E8;
                }
                table[class="table-col"] + table[class="table-col"] {
                        margin-top: 15px;
                }
```

```
        td[class="table-row-td"] {
                padding-left: 0 !important;
                padding-right: 0 !important;
        }
        table[class="navbar-row"] , td[class="navbar-row-td"] {
                width: 100% !important;
        }
        img {
                max-width: 100% !important;
                display: inline !important;
        }
        img[class="pull-right"] {
                float: right;
                margin-left: 11px;
max-width: 125px !important;
                padding-bottom: 0 !important;
        }
        img[class="pull-left"] {
                float: left;
                margin-right: 11px;
                max-width: 125px !important;
                padding-bottom: 0 !important;
        }
        table[class="table-space"], table[class="header-row"] {
                float: none !important;
                width: 98% !important;
        }
        td[class="header-row-td"] {
                width: 100% !important;
        }
}
@media only screen and (max-width: 480px) {
        table[class="table-row"] {
                padding-left: 16px !important;
                padding-right: 16px !important;
        }
}
@media only screen and (max-width: 320px) {
        table[class="table-row"] {
                padding-left: 12px !important;
                padding-right: 12px !important;
        }
}
@media only screen and (max-width: 458px) {
        td[class="table-td-wrap"] {
                width: 100% !important;
```

```
                }
        }
  </style>
 </head>
 <body style="font-family: Arial, sans-serif; font-size:13px; color: #444444; min-height: 200px;"
bgcolor="#E4E6E9" leftmargin="0" topmargin="0" marginheight="0" marginwidth="0">
 <table width="100%" height="100%" bgcolor="#E4E6E9" cellspacing="0" cellpadding="0"
border="0">
 <tr><td width="100%" align="center" valign="top" bgcolor="#E4E6E9" style="background-
color:#E4E6E9; min-height: 200px;">
<table><tr><td class="table-td-wrap" align="center" width="458"><table class="table-space"
height="18" style="height: 18px; font-size: 0px; line-height: 0; width: 450px; background-color:
#e4e6e9;" width="450" bgcolor="#E4E6E9" cellspacing="0" cellpadding="0"
border="0"><tbody><tr><td class="table-space-td" valign="middle" height="18" style="height:
18px; width: 450px; background-color: #e4e6e9;" width="450" bgcolor="#E4E6E9"
align="left">&amp;nbsp;</td></tr></tbody></table>
<table class="table-space" height="8" style="height: 8px; font-size: 0px; line-height: 0; width:
450px; background-color: #ffffff;" width="450" bgcolor="#FFFFFF" cellspacing="0"
cellpadding="0" border="0"><tbody><tr><td class="table-space-td" valign="middle"
height="8" style="height: 8px; width: 450px; background-color: #ffffff;" width="450"
bgcolor="#FFFFFF" align="left">&amp;nbsp;</td></tr></tbody></table>

<table class="table-row" width="450" bgcolor="#FFFFFF" style="table-layout: fixed;
background-color: #ffffff;" cellspacing="0" cellpadding="0" border="0"><tbody><tr><td
class="table-row-td" style="font-family: Arial, sans-serif; line-height: 19px; color: #444444;
font-size: 13px; font-weight: normal; padding-left: 36px; padding-right: 36px;" valign="top"
align="left">
  <table class="table-col" align="left" width="378" cellspacing="0" cellpadding="0" border="0"
style="table-layout: fixed;"><tbody><tr><td class="table-col-td" width="378" style="font-
family: Arial, sans-serif; line-height: 19px; color: #444444; font-size: 13px; font-weight: normal;
width: 378px;" valign="top" align="left">
    <table class="header-row" width="378" cellspacing="0" cellpadding="0" border="0"
style="table-layout: fixed;"><tbody><tr><td class="header-row-td" width="378" style="font-
family: Arial, sans-serif; font-weight: normal; line-height: 19px; color: #478fca; margin: 0px;
font-size: 18px; padding-bottom: 10px; padding-top: 15px;" valign="top" align="left">Thank
you for using JJ Auto Finance Software</td></tr></tbody></table>
    <div style="font-family: Arial, sans-serif; line-height: 20px; color: #444444; font-size:
13px;">
      <b style="color: #777777;">We are excited to have you join us</b>
      <br>
      Please refer our details here.
    </div>
  </td></tr></tbody></table>
</td></tr></tbody></table>
```

<table class="table-space" height="12" style="height: 12px; font-size: 0px; line-height: 0; width: 450px; background-color: #ffffff;" width="450" bgcolor="#FFFFFF" cellspacing="0" cellpadding="0" border="0"><tbody><tr><td class="table-space-td" valign="middle" height="12" style="height: 12px; width: 450px; background-color: #ffffff;" width="450" bgcolor="#FFFFFF" align="left"> </td></tr></tbody></table>
<table class="table-space" height="12" style="height: 12px; font-size: 0px; line-height: 0; width: 450px; background-color: #ffffff;" width="450" bgcolor="#FFFFFF" cellspacing="0" cellpadding="0" border="0"><tbody><tr><td class="table-space-td" valign="middle" height="12" style="height: 12px; width: 450px; padding-left: 16px; padding-right: 16px; background-color: #ffffff;" width="450" bgcolor="#FFFFFF" align="center"> <table bgcolor="#E8E8E8" height="0" width="100%" cellspacing="0" cellpadding="0" border="0"><tbody><tr><td bgcolor="#E8E8E8" height="1" width="100%" style="height: 1px; font-size:0;" valign="top"
align="left"> </td></tr></tbody></table></td></tr></tbody></table>
<table class="table-space" height="16" style="height: 16px; font-size: 0px; line-height: 0; width: 450px; background-color: #ffffff;" width="450" bgcolor="#FFFFFF" cellspacing="0" cellpadding="0" border="0"><tbody><tr><td class="table-space-td" valign="middle" height="16" style="height: 16px; width: 450px; background-color: #ffffff;" width="450" bgcolor="#FFFFFF" align="left"> </td></tr></tbody></table>

<table class="table-row" width="450" bgcolor="#FFFFFF" style="table-layout: fixed; background-color: #ffffff;" cellspacing="0" cellpadding="0" border="0"><tbody><tr><td class="table-row-td" style="font-family: Arial, sans-serif; line-height: 19px; color: #444444; font-size: 13px; font-weight: normal; padding-left: 36px; padding-right: 36px;" valign="top" align="left">
  <table class="table-col" align="left" width="378" cellspacing="0" cellpadding="0" border="0" style="table-layout: fixed;"><tbody><tr><td class="table-col-td" width="378" style="font-family: Arial, sans-serif; line-height: 19px; color: #444444; font-size: 13px; font-weight: normal; width: 378px;" valign="top" align="left">

    Call: +91-9489715036 0461-4000263
          E-mail: jjconsulting@gmail.com
          Web: www.jjconsulting.com

    <table class="table-space" height="16" style="height: 16px; font-size: 0px; line-height: 0; width: 378px; background-color: #ffffff;" width="378" bgcolor="#FFFFFF" cellspacing="0" cellpadding="0" border="0"><tbody><tr><td class="table-space-td" valign="middle" height="16" style="height: 16px; width: 378px; background-color: #ffffff;" width="378" bgcolor="#FFFFFF" align="left"> </td></tr></tbody></table>
  </td></tr></tbody></table>
</td></tr></tbody></table>

<table class="table-space" height="6" style="height: 6px; font-size: 0px; line-height: 0; width: 450px; background-color: #ffffff;" width="450" bgcolor="#FFFFFF" cellspacing="0"

```
cellpadding="0" border="0"><tbody><tr><td class="table-space-td" valign="middle"
height="6" style="height: 6px; width: 450px; background-color: #ffffff;" width="450"
bgcolor="#FFFFFF" align="left"> </td></tr></tbody></table>

<table class="table-row-fixed" width="450" bgcolor="#FFFFFF" style="table-layout: fixed;
background-color: #ffffff;" cellspacing="0" cellpadding="0" border="0"><tbody><tr><td
class="table-row-fixed-td" style="font-family: Arial, sans-serif; line-height: 19px; color:
#444444; font-size: 13px; font-weight: normal; padding-left: 1px; padding-right: 1px;"
valign="top" align="left">
  <table class="table-col" align="left" width="448" cellspacing="0" cellpadding="0" border="0"
style="table-layout: fixed;"><tbody><tr><td class="table-col-td" width="448" style="font-
family: Arial, sans-serif; line-height: 19px; color: #444444; font-size: 13px; font-weight:
normal;" valign="top" align="left">
    <table width="100%" cellspacing="0" cellpadding="0" border="0" style="table-layout:
fixed;"><tbody><tr><td width="100%" align="center" bgcolor="#f5f5f5" style="font-family:
Arial, sans-serif; line-height: 24px; color: #bbbbbb; font-size: 13px; font-weight: normal; text-
align: center; padding: 9px; border-width: 1px 0px 0px; border-style: solid; border-color:
#e3e3e3; background-color: #f5f5f5;" valign="top">
      <a href="#" target="_blank" style="color: #428bca; text-decoration: none; background-color:
transparent;">JJ Auto Consulting &copy; <?php echo date("Y"); ?></a>
      <br> <a href="#" target="_blank" style="color: #5b7a91; text-decoration: none; background-
color: transparent;">facebook</a>
<a href="#" target="_blank" style="color: #dd5a43; text-decoration: none; background-color:
transparent;">google+</a>
  <a href="//www.postulateinfotech.com" target="_blank" style="color: #478fca; text-decoration:
none; background-color: transparent;">web</a>
    </td></tr></tbody></table>
  </td></tr></tbody></table>
</td></tr></tbody></table>
<table class="table-space" height="1" style="height: 1px; font-size: 0px; line-height: 0; width:
450px; background-color: #ffffff;" width="450" bgcolor="#FFFFFF" cellspacing="0"
cellpadding="0" border="0"><tbody><tr><td class="table-space-td" valign="middle"
height="1" style="height: 1px; width: 450px; background-color: #ffffff;" width="450"
bgcolor="#FFFFFF" align="left"> </td></tr></tbody></table>
<table class="table-space" height="36" style="height: 36px; font-size: 0px; line-height: 0; width:
450px; background-color: #e4e6e9;" width="450" bgcolor="#E4E6E9" cellspacing="0"
cellpadding="0" border="0"><tbody><tr><td class="table-space-td" valign="middle"
height="36" style="height: 36px; width: 450px; background-color: #e4e6e9;" width="450"
bgcolor="#E4E6E9" align="left"> </td></tr></tbody></table></td></tr></table>
</td></tr>
 </table>
 </body>
 </html>
```

login.php

```
<?php
//session_start();
include('./pages/session_start.php');
if(isset($_SESSION['employee']) && isset($_SESSION['admin']))
{
	session_destroy();
}
$relToIndex="./";
include ($relToIndex."assets/font-awesome/4.5.0/ses.php");
include ($relToIndex."assets/font-awesome/4.5.0/sh.php");
$uname = addslashes($_POST['username']);
$username = $_POST['username'];
$pwd = $_POST['password'];
$savecookie = isset($_POST["remember"]) ? $_POST["remember"] : 'off' ;
include($relToIndex."dbcon/dbcon.php");
$login = "SELECT * FROM log WHERE (username = '" .$uname . "') and ( password = '" .$pwd
. "' and del_flg!='1')";
$run_query=mysqli_query($conn,$login)or die("error in $login == ----> ".mysql_error());
if(mysqli_num_rows($run_query)>0){

   /*$myfile = fopen("assets/css/css.txt", "w") or die("Unable to open file!");
	$txt = base64_encode(date('Y-m-d H:i:s'));
   fwrite($myfile, $txt);
	fclose($myfile);
  */
	while($row = mysqli_fetch_array($run_query))
	{
		extract($row);
	}
	mysqli_close($conn);
	if($savecookie=='1' || $savecookie=='on')
	{	$hours = time() + 3600 * 24 * 30;
		setcookie('username', $username, $hours);
		setcookie('pwd',$_POST['password'], $hours);
		}else{
		unset($_COOKIE['username']);
		unset($_COOKIE['pwd']);
		setcookie('username', null, time()-3600);
		setcookie('pwd', null, time()-3600);
	}
	if($level == "1")
	{
		$_SESSION['admin'] = $username;
		echo "<script>window.open('pages/admin/','_self')</script>";
	} else{
```

```
                $_SESSION['employee'] = $username;
                echo "<script>window.open('pages/employee/','_self')</script>";}
}
else {
echo "<script>alert('Wrong User Name or Password. Try Again.')</script>";
echo "<script>window.open('index.php','_self')</script>";
}
?>
```

logout.php

```
<?php
$relToUser = "./";
$relToDashBoard = "../".$relToUser;
$relToIndex ="../".$relToDashBoard;
//session_start();
include($relToDashBoard.'session_start.php');
session_destroy();
//header("Location: ../../index.php");
echo "<script>window.open('".$relToIndex."','_self')</script>";
?>
```

loan_report

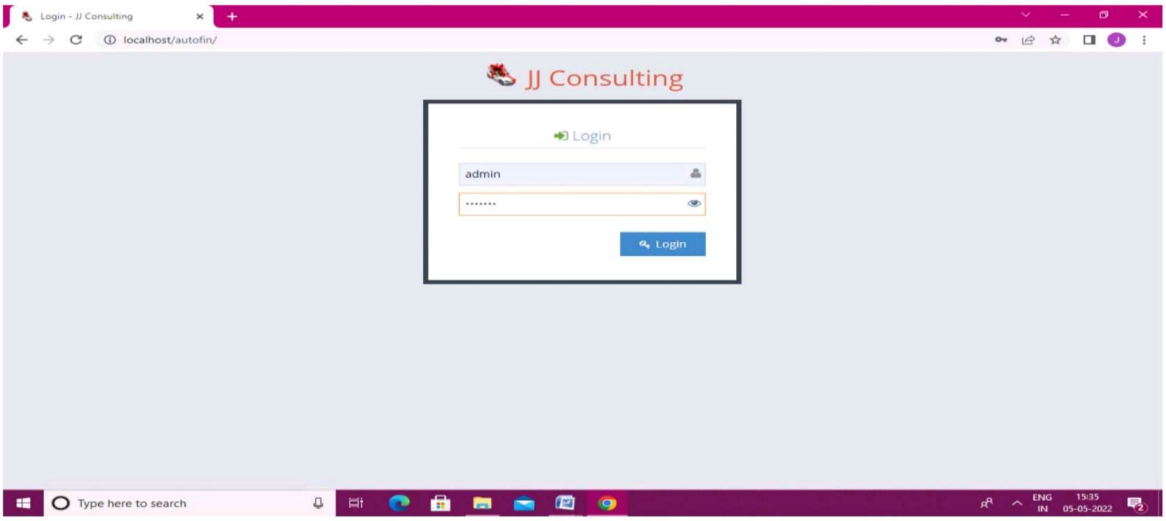
```
<?php
$sel_loantype_id = "";
$sel_account_financier_id = "";
$sel_id_from_vehicle_no = "";
$load_loanid = "";
$sel_id_from_loanholder_name = "";
if(isset($_POST['ltype']) && !empty($_POST['ltype'])){
$sel_loantype_id = $_POST['ltype'];
}
if(isset($_POST['finid']) && !empty($_POST['finid'])){
$sel_account_financier_id = $_POST['finid'];
}
if(isset($_POST['vehno']) && !empty($_POST['vehno'])){
$sel_id_from_vehicle_no = $_POST['vehno'];
$load_loanid = $sel_id_from_vehicle_no;
}
if(isset($_POST['lhname']) && !empty($_POST['lhname'])){
$sel_id_from_loanholder_name = $_POST['lhname'];
}
$autoload_loanid = "";
if(isset($_GET['load_id']) && !empty($_GET['load_id'])){
        $autoload_loanid = $_GET['load_id'];
        $load_loanid = $autoload_loanid;}
if(isset($autoload_loanid) && !empty($autoload_loanid)){
```

```
	$qry_local = "SELECT loantype_id, account_financier_id, vehicle_no, loanholder_name
from loan_account where id='".$autoload_loanid."'";
	include($relToIndex."dbcon/dbcon.php");
	$run_query=mysqli_query($conn,$qry_local);
	if(mysqli_num_rows($run_query)>0)
	{
		while($row = mysqli_fetch_array($run_query))
		{
			$sel_loantype_id = $row['loantype_id'];
			$sel_account_financier_id = $row['account_financier_id'];
			$sel_id_from_vehicle_no = $autoload_loanid;//$row['vehicle_no'];
			$sel_id_from_loanholder_name = $autoload_loanid;
			$sel_id_from_loan_no = $autoload_loanid;
			$load_loanid = $autoload_loanid;
		}}}

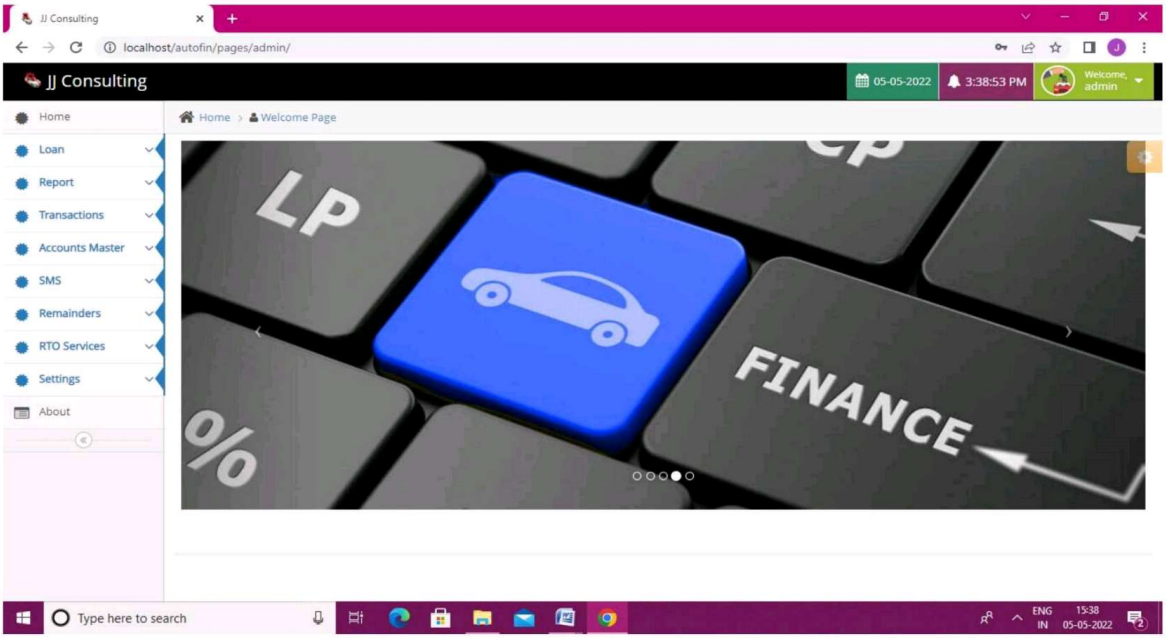
$now_str = date("Y-m-d");
$nowdate = date_create($now_str);
$tendays_after_now = $nowdate;
date_add($tendays_after_now, date_interval_create_from_date_string("10 days"));
$tendays_after_now_str = date_format($tendays_after_now,"Y-m-d");
$rptdt = $now_str;
if(isset($_POST['rptdt']) && !empty($_POST['rptdt'])){
	$rptdt = $_POST['rptdt'];}
$rptdt_str = date_format(date_create($rptdt),"d-M-Y");
$BtnTyp = "";
?>
```

9. SCREENSHOTS

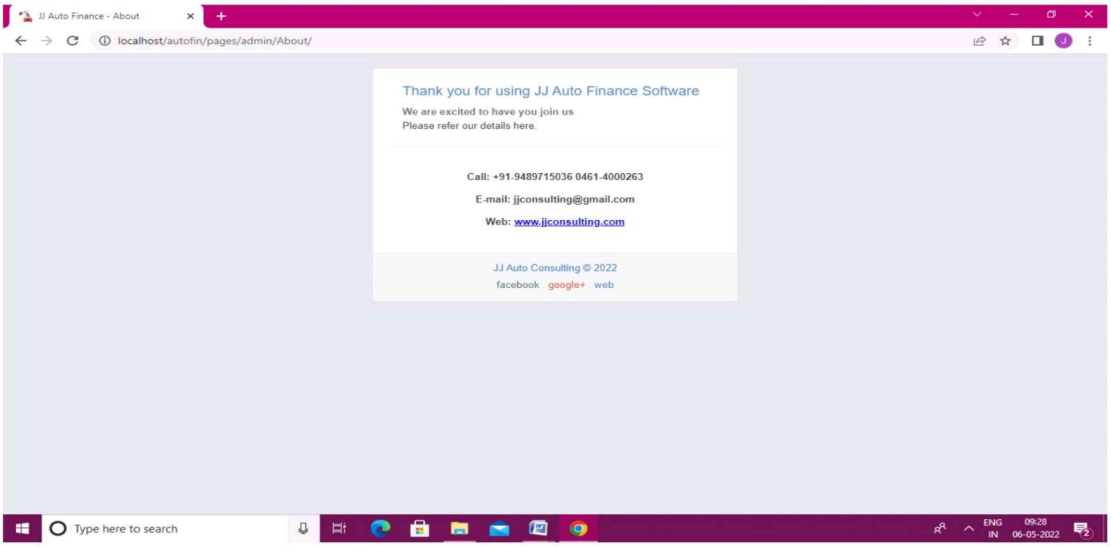
Login Page



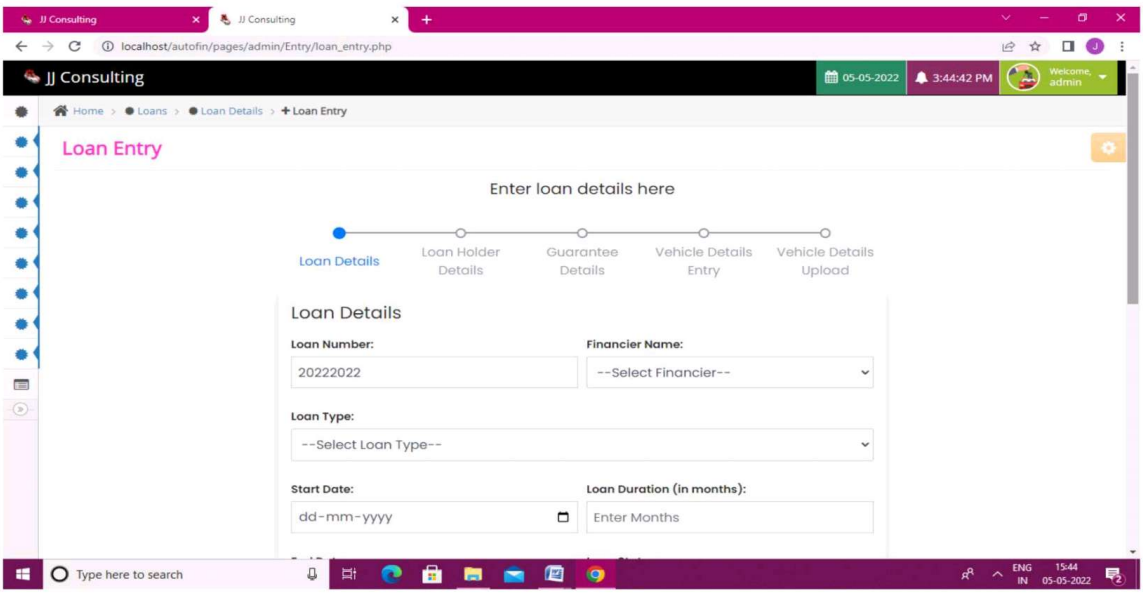
Home Page



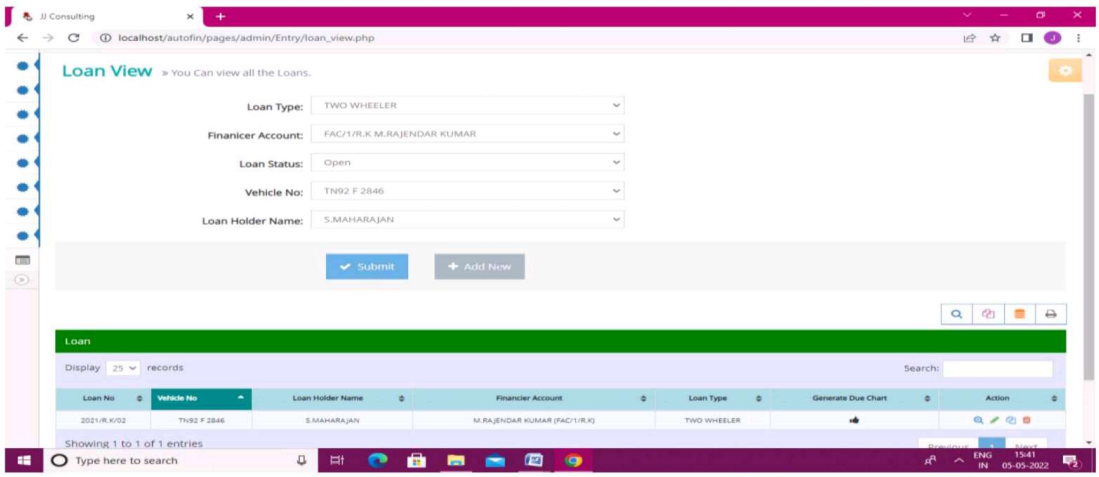
About



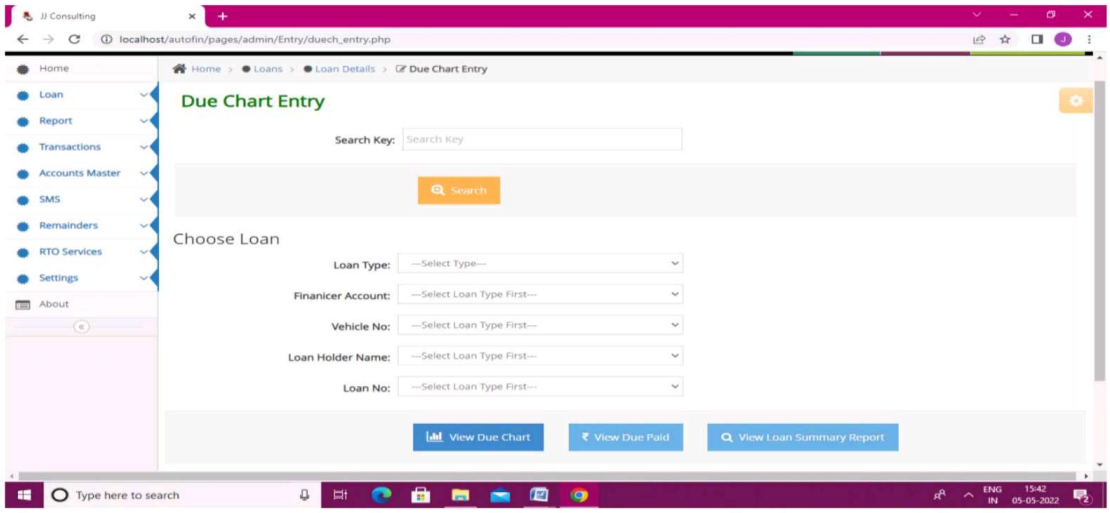
Add Loan



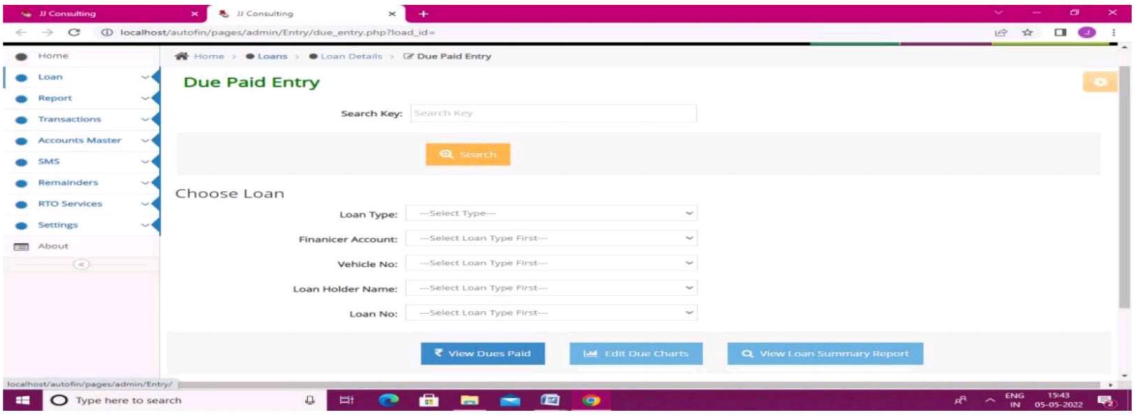
View Loan



Due chart Entry



Due Paid Entry



Loan Summary

Loan No: LOAN/J.K/0016

Loan Start Date: 17-Apr-2022

Loan End Date: 17-Apr-2023

Loan Holder Name: J. Nadeem

Address: 12, North Street, Chennai.

Contact: 8909878767, ,

Loan Status: Active

RC Book Status: with owner

Loan Account Summary: (As on 05-May-2022)

Financier Name: Jeya

Vehicle No: TN69AJ

Vehicle Model: T

Manufacture: Maruthi

Varient: 333

Loantype: L.M.V/OWN BOARD

Guaranteed Name: J. Sharmila

Address: 12, North Street, Chennai.

Contact: 8909898767, ,

Relation: Mother

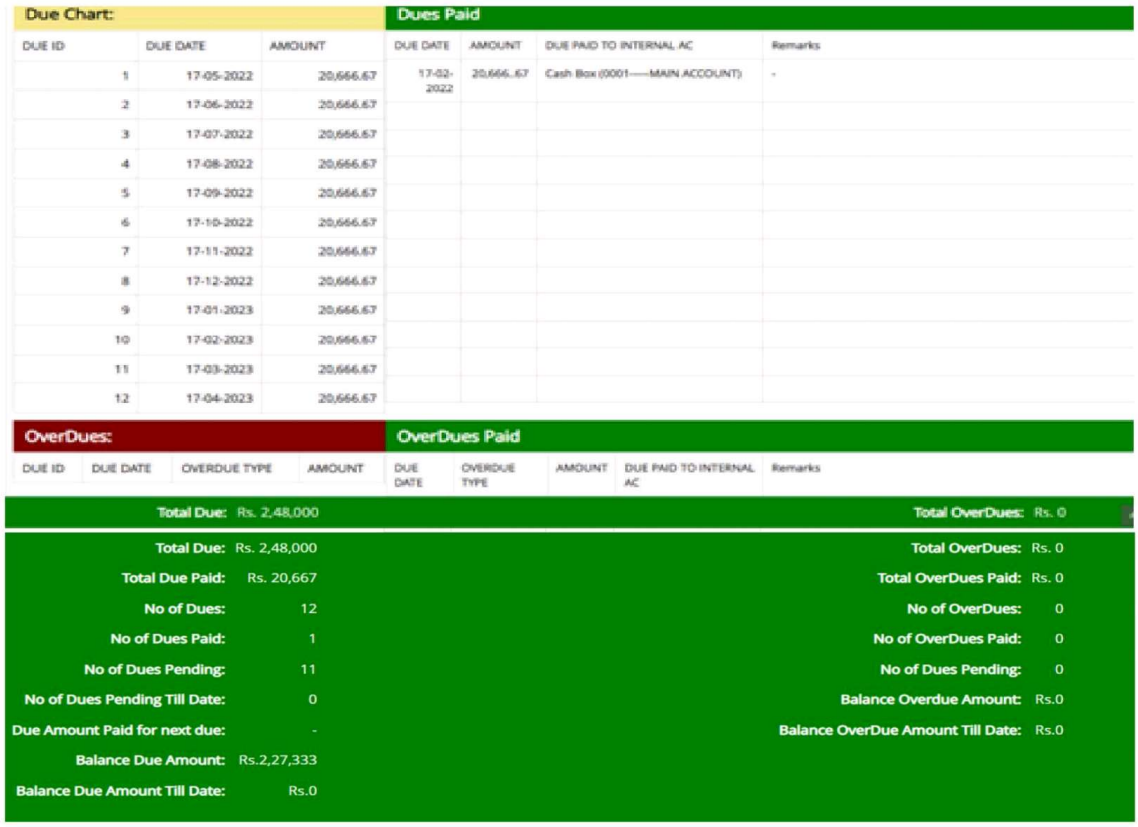
Insurance Expiry Date: 12-Dec-1999

FC Expiry Date: 12-Dec-1999

Tax Expiry Date: 12-Dec-1999

Permit Expiry Date: 12-Dec-1999

Due Chart



Due Chart:

DUE ID	DUE DATE	AMOUNT
1	17-05-2022	20,666.67
2	17-06-2022	20,666.67
3	17-07-2022	20,666.67
4	17-08-2022	20,666.67
5	17-09-2022	20,666.67
6	17-10-2022	20,666.67
7	17-11-2022	20,666.67
8	17-12-2022	20,666.67
9	17-01-2023	20,666.67
10	17-02-2023	20,666.67
11	17-03-2023	20,666.67
12	17-04-2023	20,666.67

Dues Paid

DUE DATE	AMOUNT	DUE PAID TO INTERNAL AC	Remarks
17-02-2022	20,666..67	Cash Box (0001------MAIN ACCOUNT)	-

OverDues:

DUE ID	DUE DATE	OVERDUE TYPE	AMOUNT

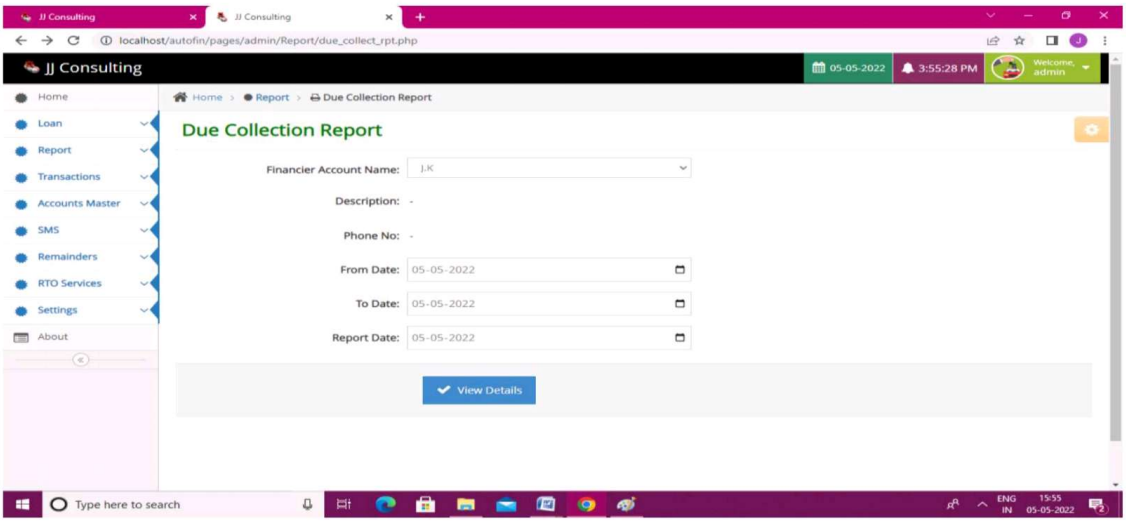
OverDues Paid

DUE DATE	OVERDUE TYPE	AMOUNT	DUE PAID TO INTERNAL AC	Remarks

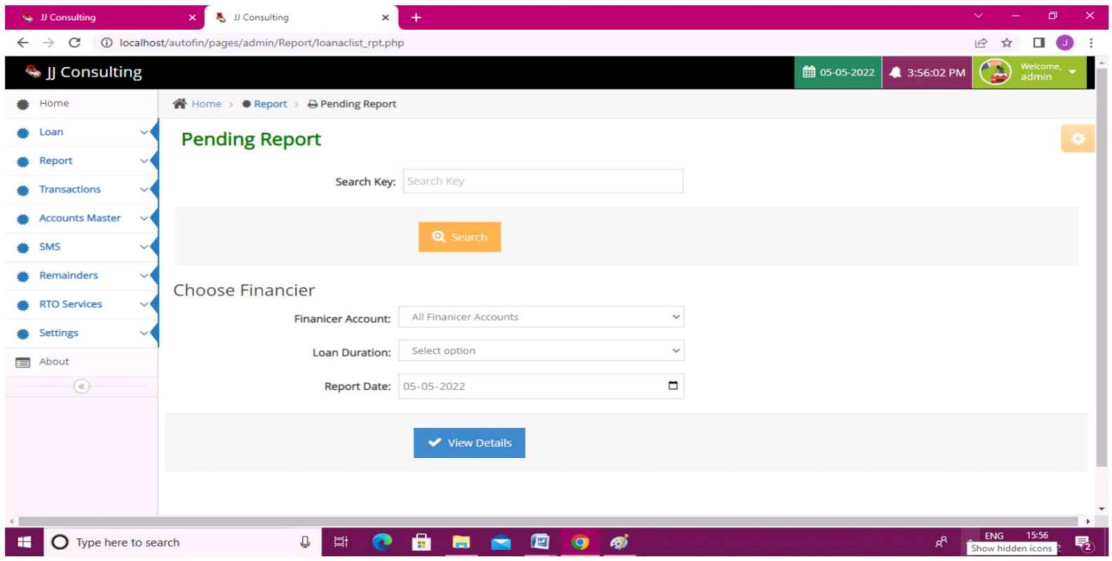
Total Due: Rs. 2,48,000 **Total OverDues:** Rs. 0

Total Due:	Rs. 2,48,000	**Total OverDues:**	Rs. 0
Total Due Paid:	Rs. 20,667	**Total OverDues Paid:**	Rs. 0
No of Dues:	12	**No of OverDues:**	0
No of Dues Paid:	1	**No of OverDues Paid:**	0
No of Dues Pending:	11	**No of Dues Pending:**	0
No of Dues Pending Till Date:	0	**Balance Overdue Amount:**	Rs.0
Due Amount Paid for next due:	-	**Balance OverDue Amount Till Date:**	Rs.0
Balance Due Amount:	Rs.2,27,333		
Balance Due Amount Till Date:	Rs.0		

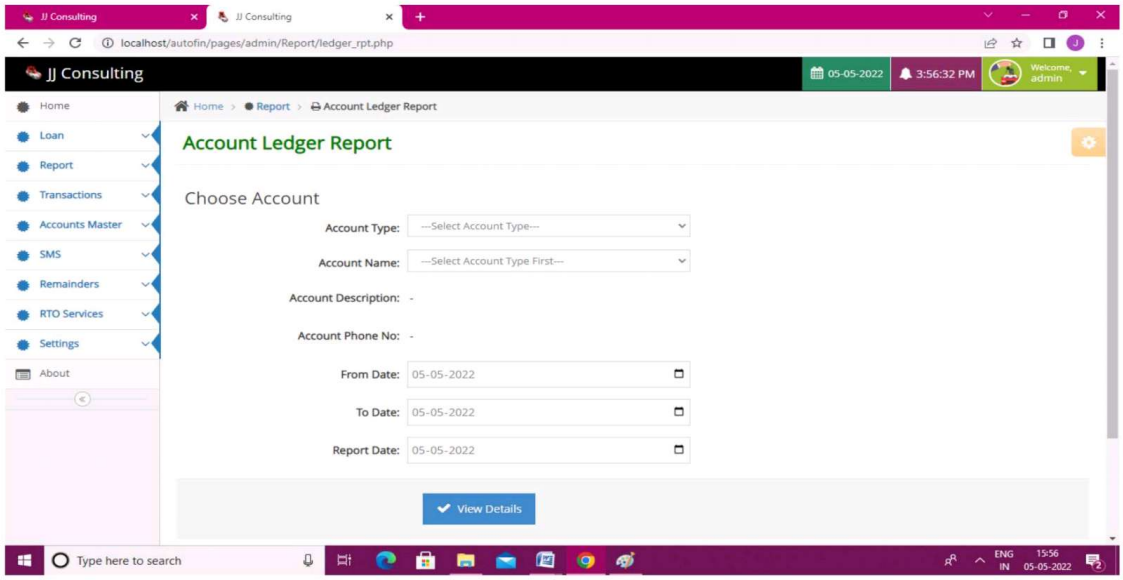
Due Collection Report



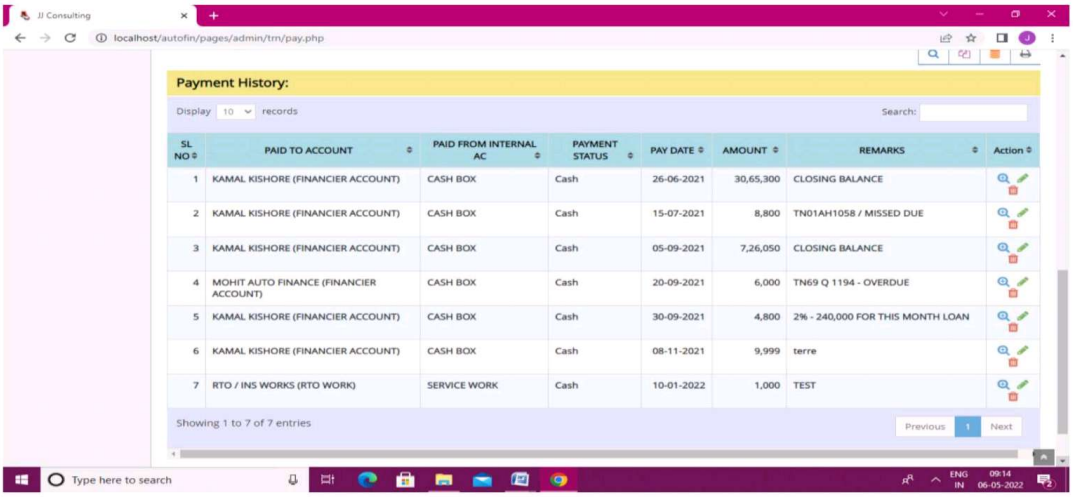
Pending Report



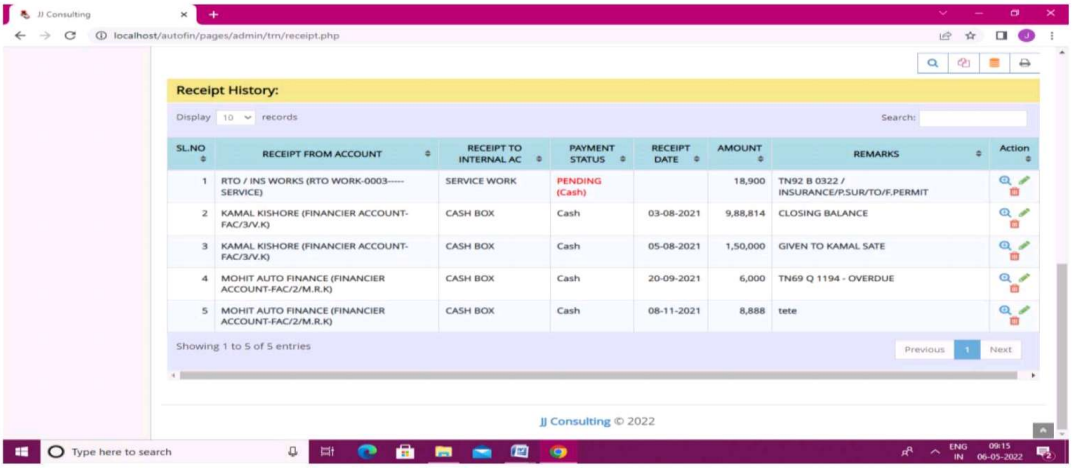
Ledger Report



Debit



Credit



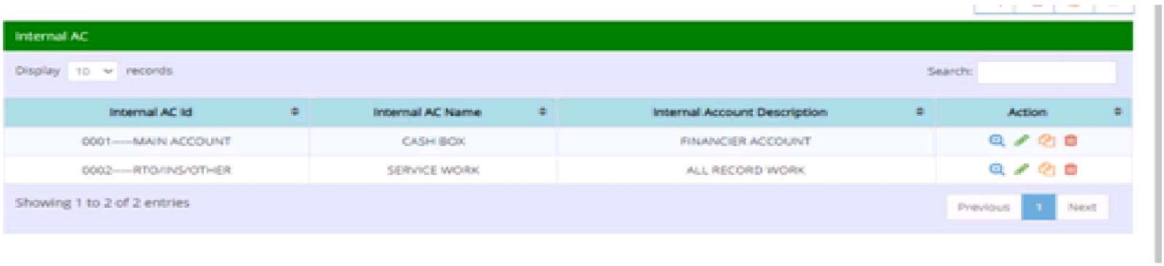
Add Financier

Financiers

Display 10 records Search:

S.No.	Financier Id	Financier	Financier Name	Financier Description	Action
1	R.K & M.R.K	FAC/1/R.K	M.RAJENDAR KUMAR	KANECHA SYNDICATE , NO:14, O.M.R ,KANDHAN CHAVADI,6000	
2	R.K & M.R.K	FAC/2/M.R.K	MOHIT AUTO FINANCE	2.KALATHI PILLAI STREET, SOWCARPET,600079	
3	V.K	FAC/3/V.K	KAMAL KISHORE	RAMAR FINANCE, RAMLAKHAN CHAMBER, SOWCARPET,	
4	J.K	J.K&R.K	Jeya	J.K Finance, Madurai.	

Internal Account



Internal AC

Display 10 records Search:

Internal AC Id	Internal AC Name	Internal Account Description	Action
0001-----MAIN ACCOUNT	CASH BOX	FINANCIER ACCOUNT	
0002-----RTO/INS/OTHER	SERVICE WORK	ALL RECORD WORK	

Showing 1 to 2 of 2 entries Previous 1 Next

Other Account

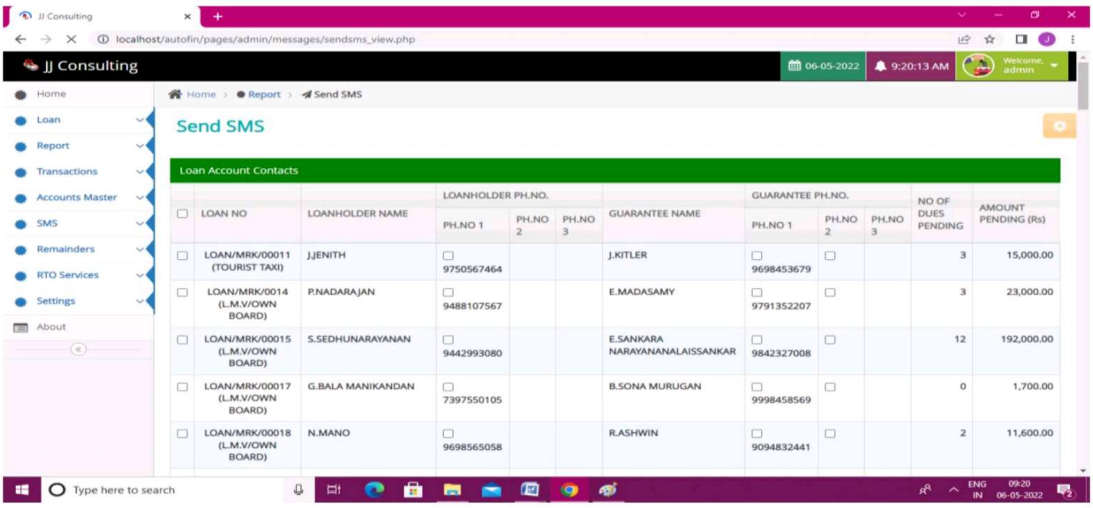
Other Accounts

Display 10 records Search:

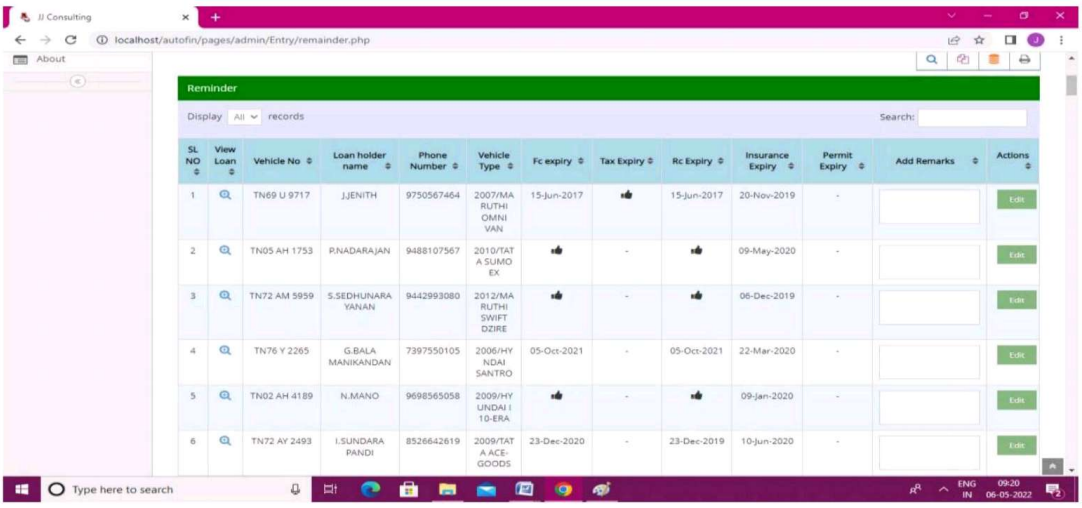
Other AC Id	Other AC Name	Other AC Type	Other AC Description	Phone No	Action
0003-----SERVICE	RTO / INS WORKS	RTO WORK	ALL WORK REGARDING RTO OFFICE	+91-9487646381	
0001-----INCOME	OFFICE INCOME	DC,OD,SETTLEMENT	DC, SETTLEMENT, OD	+91-9443245381	

Showing 1 to 2 of 2 entries Previous 1 Next

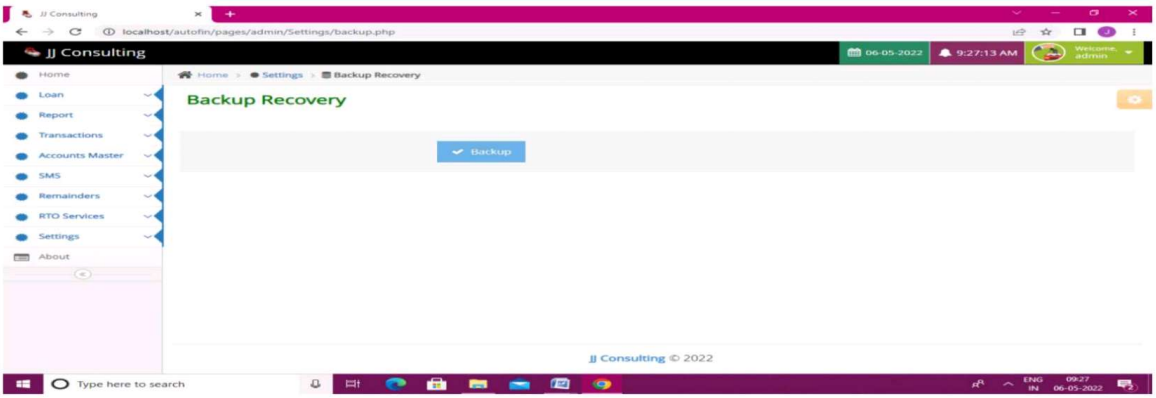
SMS



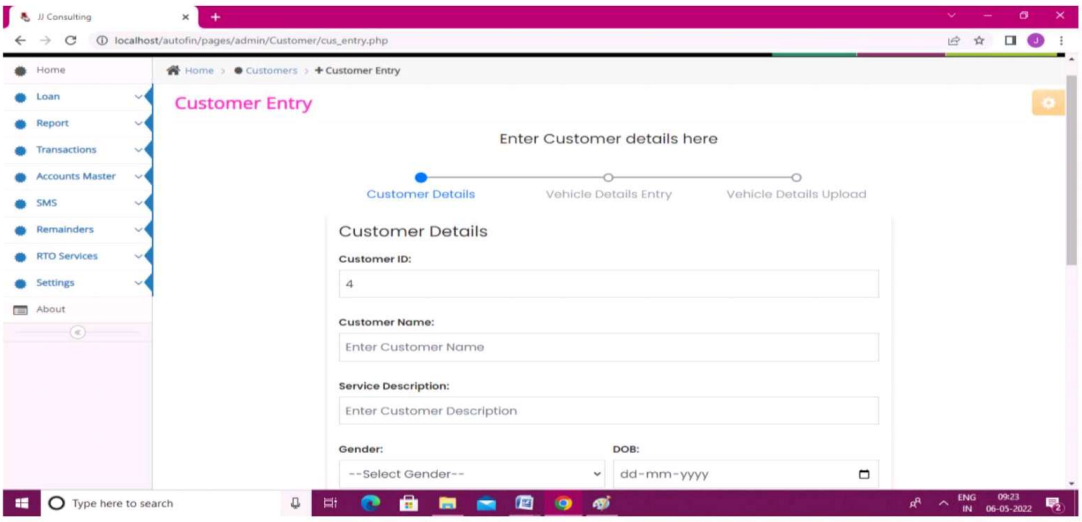
View Remainder



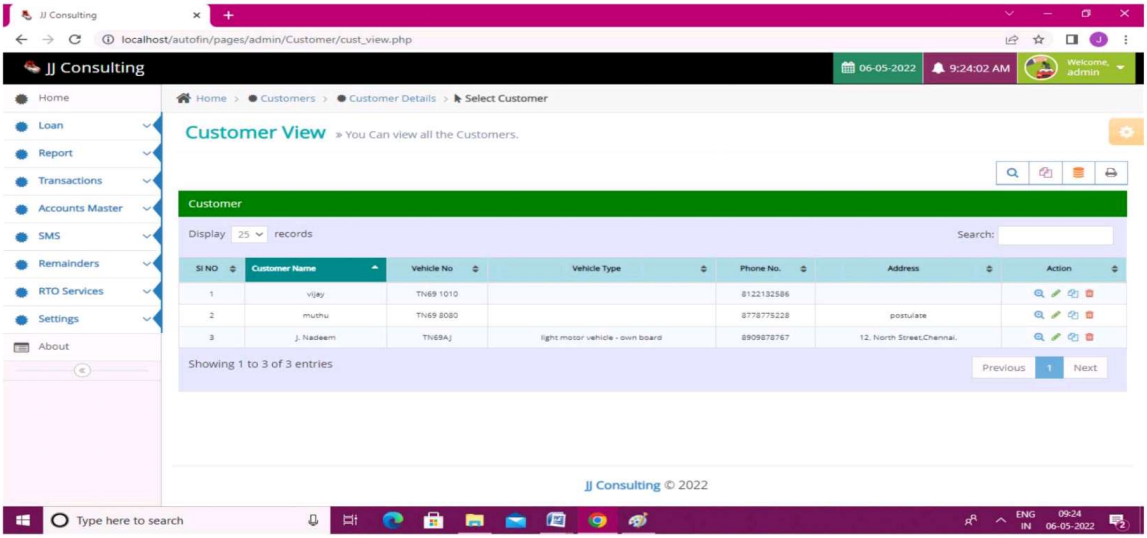
Backup



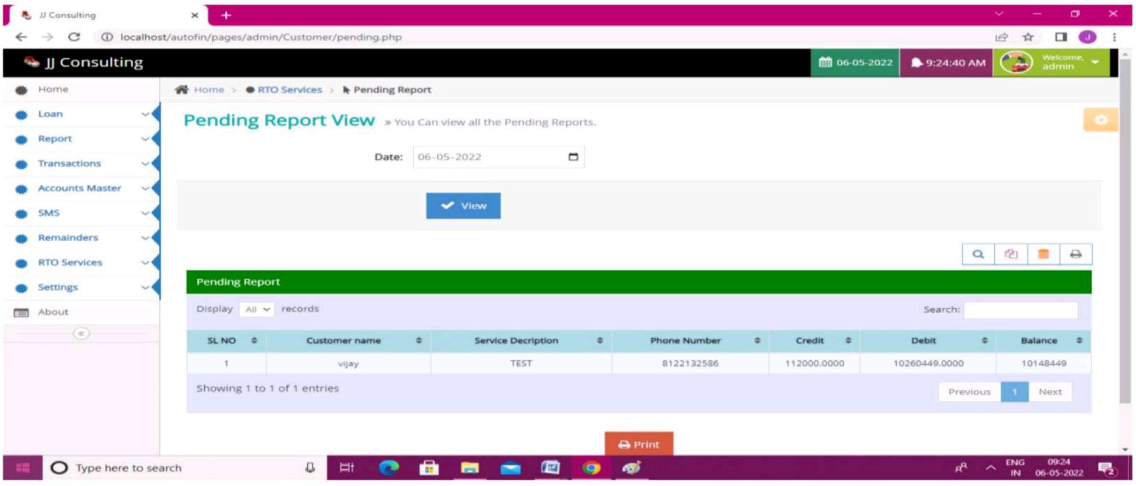
Add Customers



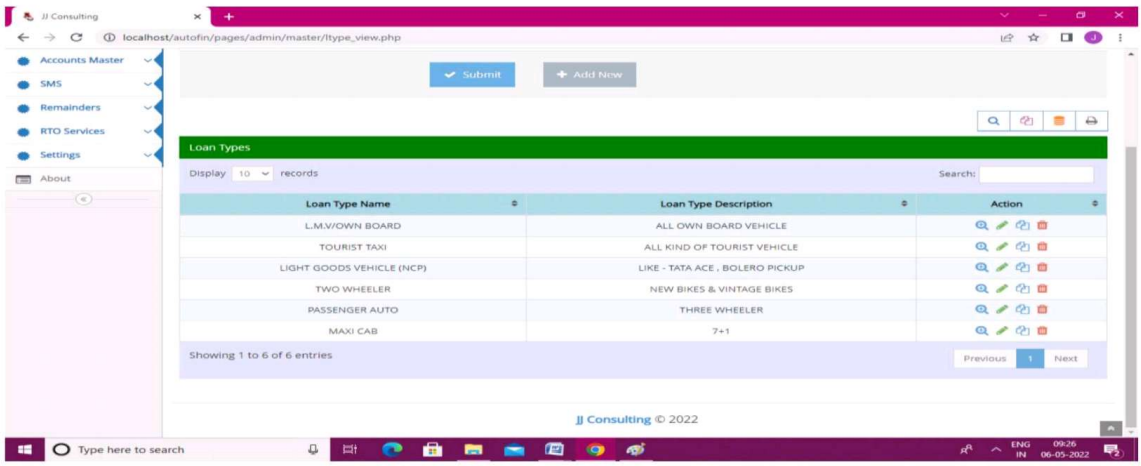
View Customers



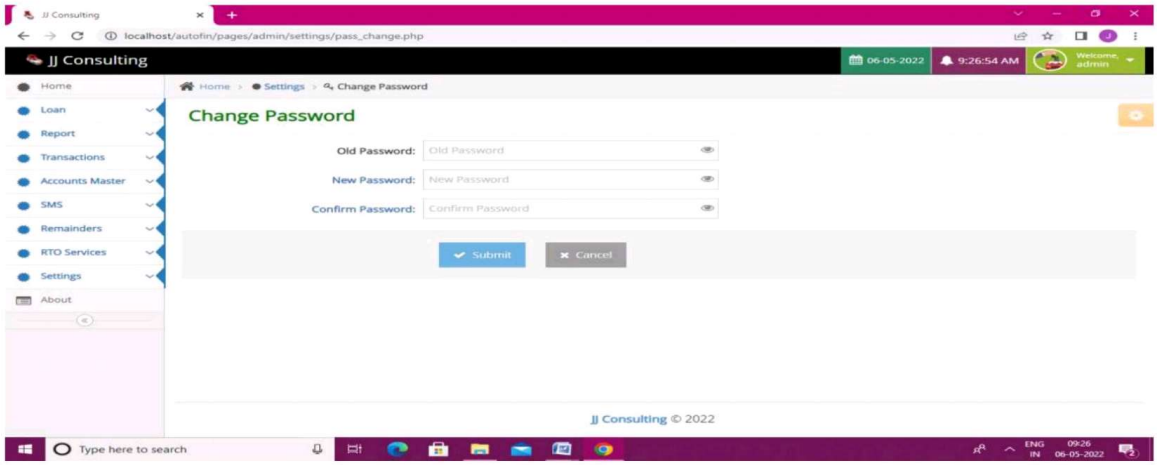
Customer Pending



Loan Type



Change Password



10. CONCLUSION

This project is developed to nurture the needs of an admin in an agency by embedding all the tasks of transactions taking place in a finance company. Future version of this project will still be much enhanced than the current version. Managing paper forms of loan process is an old technique that is quite troublesome and can have the risk of missing the paper. This "**Vehicle loan and RTO Service System**" is a Web-based application. This system includes various features like Adding loan for customers, Reports, Transactions, Accounts master and so on. Applying for loans is a tiring and confounded cycle. Vehicle Loan and RTO service system project is an innovative tool that is fast becoming a necessity. It is a successful strategic weapon for any organization to remain profitable in a volatile and competitive marketplace of today.RTO service system provides the facility of applying licenses online, issuance of permanent license, tax challans, and receiving payments against challans. The project has been appreciated by all the users in the organization. User friendly screens are provided. The usage of software increases the efficiency, decreases the effort.It has been efficiently employed as a project management mechanism. Thus the Vehicle Loan and RTO Service System is developed and executed successfully.

11. FUTURE ENHANCEMENT

The most valuable future looks are following below:

- ✓ More branches of the company, maybe it will be international, that means more facility will be available.

- ✓ Admin issues development based on their needs, so the help desk will be aware of their needs and easy to use.

- ✓ Developing a mobile App for loan processing system that help admin to do his operations without go to the company only he need to sign in using his A/C NO and password and also to use your own PIN. Finally the system will update automatically.

- ✓ SMS Gateway will be purchased further to send SMS to the required Customers.

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EYE DETECTION MOBILE APPLICATION

A project submitted to

ST. MARY'S COLLEGE (Autonomous), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

In partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

K. SANGEETHA

Reg. No.: 20SPCS19

Under the Supervision and Guidance of

Ms. A. Jenitta Jebamalar M.Sc(IT)., M.Sc(CS)., M.Phil., B.Ed.,

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi-628001

May 2022

CERTIFICATE

This is to certify that this project work entitled "**EYE DETECTION MOBILE APPLICATION"** is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to Manonmaniam Sundaranar University, Tirunelveli, in partial fulfillment for the award of the degree of Master of Science in Computer Science for the work done during the year 2021-2022 by **K. SANGEETHA (Reg. No.:20SPCS19)**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do here by declare that, the project entitled "**EYE DETECTION MOBILE APPLICATION"** submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Ms. A. Jenitta Jebamalar M.Sc(IT)., M.Sc(CS)., M.Phil., B.Ed.,** Assistant Professor PG Department of Computer Science (SSC), St. Mary's College (Autonomous), Thoothukudi**.**

Station: Thoothukudi **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PG DCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani , Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET., assistant professor and Co-ordinator, PG department of computer science (SSC) for her support and counsel.

I express my hearty thanks to my guide Ms. A. Jenitta Jebamalar M.Sc(IT)., M.Sc(CS)., M.Phil., B.Ed., Assistant Professor, PG Department of Computer Science (SSC) for her Valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to Dr. Vidhya Vijayalakshmi MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science(SSC), for her encouragement and support.

I am much indebted to Dr. P. Johnson Durai Raj, Director Postulate Infotech for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

ABSTRACT

Nowadays research in face features detection and recognition is getting more attention due to its different applications in science. This project presents a mobile healthcare (mHealth) system for estimation of visual impairment that provides easiness by specifying the degree of an eye as orthoscopes. Our proposed system which is an Android based mobile application aimed to be used by patients who have myopia. In the crowd society, our proposed app will be implemented faster than the traditional ophthalmologic examination treatments as an alternative. Because this application can be used in everywhere in any time slot, it is offered in the area where the ophthalmologist is not available.

In the start-up screen, the letter is demonstrated and if the user unable to see it clearly, the letter's size is being zoomed out until the user able to respond correct answer. However, if the user says correct answer in three phases consecutively, eyesight ratio is produced by the system to the user referencing to Euclidean distance value. This project has aimed at making a prediction about the visual impairment's power. Through this application, people can get idea about their visual acuity without consulting to an eye medical doctor (MD). For the evaluation of systems' reliability, field tests were performed. At the end of application, the actual diagnosed power are shown.

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INTRODUCTION

Visual impairment is a common disease in today's world, and it is mostly seen in people who are aged 65 and older. Although the number of elderly people with visual impairment is much higher, this disease is seen in children with the ratio approximately 26% in this decade. With developing technology, the solutions of the diseases can be found in different platforms and the importance of eHealth has begun to be understood.

Ophthalmology is a medical branch that is related to vision problems so that ophthalmologic examination is very common in hospitals in order to diagnose the vision problems. To specifying the degree of vision of people with visual impairment, orthoscopes are used as primary tools.

In this project, a mobile application that grades the eye disorders of patients was presented. This mobile application was developed to be used for people with visual impairment who can benefit from this application to state their visual acuity anywhere. Zooming is the only used interaction method for implementing our application. With using to user response, the system process acuity and states vision problems.

In this application, there are three phases. At the first phase user needs to respond from 30 centimeters away from the device, consequently he needs to respond from 50centimeters away from the device at last in third phase he needs to respond from 70centimeters away from the device. The text sizes obtained from three phases have been processed, and result will be produced based on Euclidean distance. Patients are asked to respond correctly to the demonstrated letter.

In today's world, ratio of visual impairment is increasing day by day so that some solutions in order to ease doctor's workload should be found. Our proposed model is designed to be serviced under this goal.

SYSTEM SPECIFICATION

HARDWARE REQUIREMENTS

- **PROCESSOR:** 11th Gen Intel (R)Core(TM) i3 @ 3.00Hz 3.00Gz
- **SYSTEM TYPE:** 64-bit Operating System x 64-based processor.
- **RAM:** 4.00GB
- **OS:** WINDOWS 10

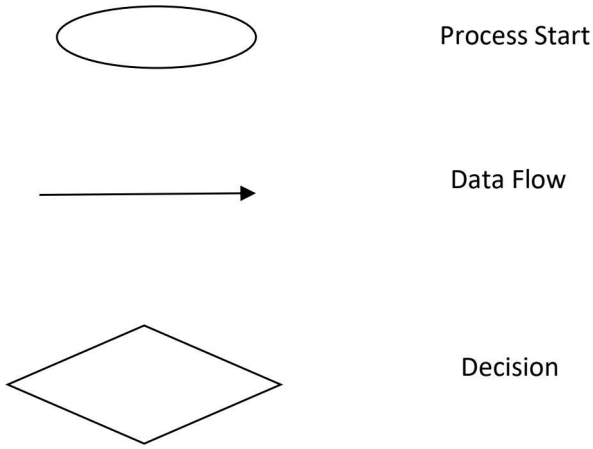
SOFTWARE REQUIREMENTS

- **OPERATING SYSTEM:** Windows XP/7
- **FRONT END:** Java
- **DEVELOPMENT TOOL:** Android Studio 3.7

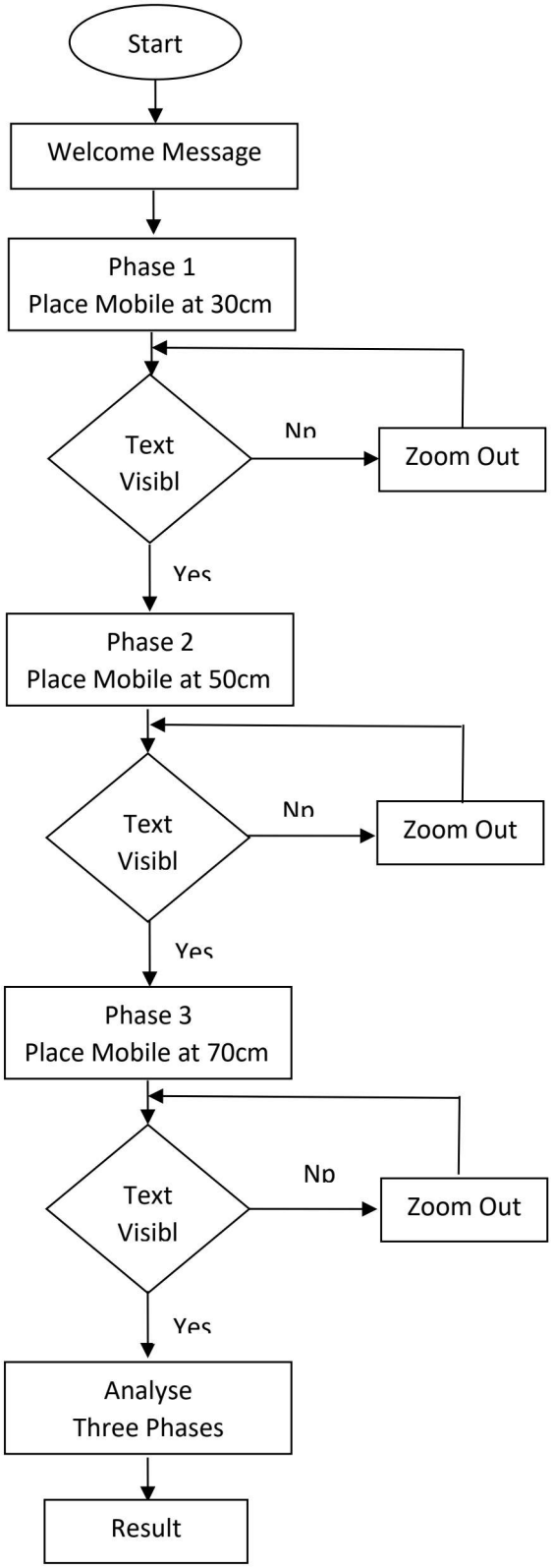
SYSTEM DESIGN

A data flow diagram is graphical tool used to describe and analyse movement of data through a system. These are the central tool and the basis from which the other components are developed. The transformation of data from input to output, through processed, may be described logically and independently of physical components associated with the system. These are known as the logical data flow diagrams. The physical data flow diagrams show the actual implements and movement of data between people, departments and workstations. A full description of a system actually consists of a set of data flow diagrams. Using two familiar notations Yourdon, Gane and Sarson notation develops the data flow diagrams. Each component in a DFD is labeled with a descriptive name. Process is further identified with a number that will be used for identification purpose. The development of DFD'S is done in several levels. Each process in lower level diagrams can be broken down into a more detailed DFD in the next level. The top-level diagram is often called a "context diagram".

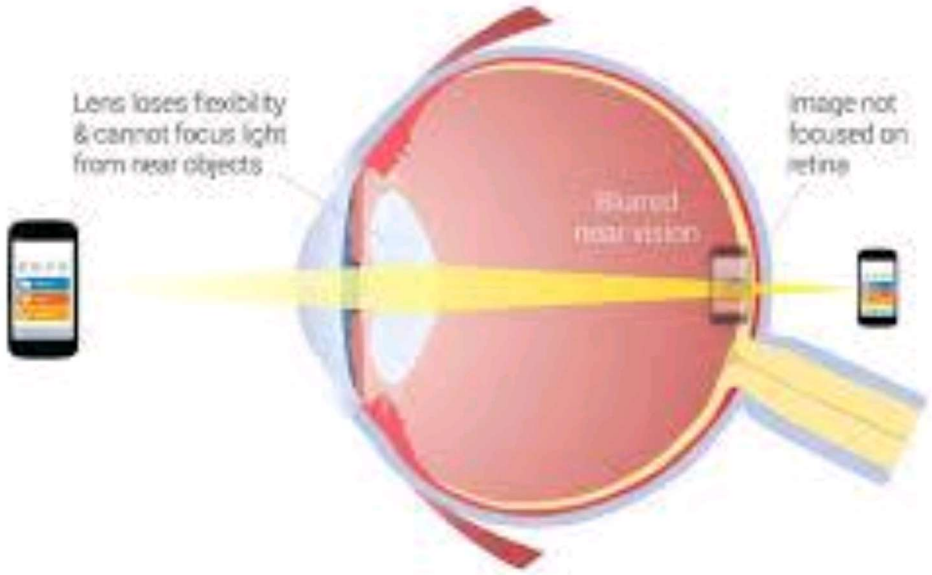
Symbols Elementary references



ENTITY RELATION DIAGRAM



BLOCK DIAGRAM



PROJECT DESCRIPTION

Eye Detection Mobile Application Project in Android aimed to be used by patients who have myopia. There are three phases to check the patients eye power and the result will be shown in the final stage.

- Home Page
- Phase-I
- Phase-II
- Phase-III
- Analyse
- Result

Home Page

The user starts the application from this welcome page. By clicking “Lets Begin” Button the user can move on to Phase-I, from there user will begin his session.

Phase-I

At this Phase the user will be instructed to place his device at approximately 30-40 cm range. Then the user will try read the word on the screen, if the user is unable to see the word, he can zoom out the screen and make the word bigger, at which text size the user will see the word clearly he will fix it by clicking the button “Yes text visible” then it will lead him to Phase-II.

Phase-II

At this Phase the user will be instructed to place his device at approximately 50-60 cm range. Then the user will follow the same steps as he followed on above phase, at which text size the user will see the word clearly he will fix it by clicking the button “Yes text visible” then it will lead him to Phase-III.

Phase-III

At this Phase the user will be instructed to place his device at approximately 80-90 cm range. Then the user will follow the same steps as he followed on above phase, at which text size the user will see the word clearly he will fix it by clicking the button “Yes text visible” then it will lead him to Analyse Stage.

Analyse

At this stage, the power of the user will be analysed using Euclidean Distance. Previously, data are gathered from some visually impaired people. Thus the gathered data’s are trained and stored in the system. Euclidean Distance has been calculated for each previously stored data and newly user checked data. Among the distance calculated the minimum distance will be taken as result.

Euclidean Distance

$$d(p,q) = d(q,p) = \sqrt{(q_1 - p_1)^2 + (q_2 - p_2)^2 + \ldots + (q_n - p_n)^2}$$
$$= \sqrt{\sum_{i=1}^{n} (q_i - p_i)^2}.$$

Two dimensions

$$d(p,q) = \sqrt{(q_1 - p_1)^2 + (q_2 - p_2)^2 + (q_3 - p_3)^2}$$

Where q_1, q_2, q_3 are the text sizes obtained from the current users respectively. p_1, p_2, p_3 are the text sizes stored in the system respectively.

Result

At this final stage the acuity power of the user will be shown

TESTING AND IMPLEMENTATION

System Implementation

Implementation is the most crucial stage in achieving a successful system and giving the user's confidence that the new system is workable and effective. Implementation of a modified application to replace an existing one. This type of conversation is relatively easy to handle, provide there are no major changes in the system.

Each program is tested individually at the time of development using the data and has verified that this program linked together in the way specified in the programs specification, the computer system and its environment is tested to the satisfaction of the user. The system that has been developed is accepted and proved to be satisfactory for the user. And so the system is going to be implemented very soon. A simple operating procedure is included so that the user can understand the different functions clearly and quickly.

Testing

Testing is a process, which reveals errors in the program. It is the major quality measure employed during software development. During testing, the program is executed with a set of conditions known as test cases and the output is evaluated to determine whether the program is performing as expected.

Software testing is the process of testing the functionality and correctness of software by running it. Process of executing a program with the intent of finding an error.

A good test case is one that has a high probability of finding an as yet undiscovered error. A successful test is one that uncovers an as yet undiscovered error. Software testing is usually performed for two reasons.

- Defect detection
- Reliability estimation

TESTING OBJECTIVES

- Testing is a process of executing a program with the intent of finding an error.
- A good test case is one that has a high probability of finding an as yet undiscovered.
- A successful test is one that uncovers an as yet undiscovered error.

TESTING PRINCIPLES

- All tests should be traceable to customer requirements.
- Tests should be planned large before testing begins.
- Testing should begin “In the Small” and progress towards “In the Large”.

TYPES OF TESTING

In order to make sure that the system does not have errors, the different levels of testing strategies that are applied at differing phases of software development are:

Unit Testing

Unit Testing is done on individual modules as they are completed and become executable.

It is confined only to the designer's requirements.

Each module can be tested using the following two strategies:

i) Black Box Testing

In this strategy some test cases are generated as input conditions that fully execute all functional requirements for the program. This testing has been uses to find errors in the following categories:

a) Incorrect or missing functions

b) Interface errors

c) Errors in data structure or external database access

d) Performance errors

e) Initialization and termination errors.

In this testing only the output is checked for correctness. The logical flow of the data is not checked.

ii) White Box testing

In this the test cases are generated on the logic of each module by drawing flow graphs of that module and logical decisions are tested on all the cases.

It has been uses to generate the test cases in the following cases:

a) Guarantee that all independent paths have been executed.

b) Execute all logical decisions on their true and false sides.

c) Execute all loops at their boundaries and within their operational bounds.

d) Execute internal data structures to ensure their valid

EXECUTION TEST

This program was successfully loaded and executed. Because of good programming there were no execution errors.

OUTPUT TEST

The successful output screens are placed in the output screens section above.

CODING

Phase1.php

```
package com.zoom;
import androidx.appcompat.app.AppCompatActivity;
import android.app.Activity;
import android.content.Intent;
import android.os.Bundle;
import android.util.TypedValue;
import android.view.MotionEvent;
import android.view.View;
import android.view.View.OnTouchListener;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
import com.zoom.R;
public class MainActivity extends AppCompatActivity  {
 TextView mytv;
    Button displayResult;
public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activitymain);
displayResult = (Button) findViewById(R.id.button);
        mytv = (TextView) findViewById(R.id.textView);
        mytv.setText("  EYE SIGHT\n  POWER\n  CHECKER");
displayResult.setOnClickListener(new View.OnClickListener() {
            @Override
public void onClick(View v) {
              // mytv.setTextSize(TypedValue.COMPLEX_UNIT_PX, 12);
```

```
            Intent intent1 = new Intent(MainActivity.this, phase1.class);
            startActivity(intent1);
//Toast.makeText(getApplicationContext(), String.valueOf(text)
,Toast.LENGTH_SHORT).show();
}
 });
   }
   @Override
   public void onBackPressed() {
      finish();
      System.exit(0);
   }
}
```

Size_30.php

```
package com.zoom;
import android.content.Intent;
import android.os.Bundle;
import android.view.MotionEvent;
import android.view.View;
import android.view.View.OnTouchListener;
import android.widget.Button;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;
public class size_30 extends AppCompatActivity implements OnTouchListener  {
   final static float STEP = 200;
   TextView mytv;
   float mRatio = 1.0f;
   int mBaseDist;
   float mBaseRatio;
   float fontsize = 13;
```

```
    Button displayResult;
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.size_30);
        displayResult = (Button) findViewById(R.id.button);
        mytv = (TextView) findViewById(R.id.textView);
        mytv.setTextSize(mRatio + 13);
        displayResult.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // mytv.setTextSize(TypedValue.COMPLEX_UNIT_PX, 12);
                int text = (int) mytv.getTextSize();
                String str=  String.valueOf(text);
                Intent intent1 = new Intent(size_30.this, size_show.class);
                Bundle bundle = new Bundle();//Add your data to bundle
                bundle.putString("keysize30",str);
                //Add the bundle to the intent
                intent1.putExtras(bundle);
                startActivity(intent1);
                //Toast.makeText(getApplicationContext(), String.valueOf(text)
,Toast.LENGTH_SHORT).show();
            }
        });
    }
    public boolean onTouchEvent(MotionEvent event) {
        if (event.getPointerCount() == 2) {
            int action = event.getAction();
            int pureaction = action & MotionEvent.ACTION_MASK;
            if (pureaction == MotionEvent.ACTION_POINTER_DOWN) {
                mBaseDist = getDistance(event);
```

```
            mBaseRatio = mRatio;
        } else {
            float delta = (getDistance(event) - mBaseDist) / STEP;
            float multi = (float) Math.pow(2, delta);
            mRatio = Math.min(1024.0f, Math.max(0.1f, mBaseRatio * multi));
            mytv.setTextSize(mRatio + 13);
        }
    }
    return true;
}
int getDistance(MotionEvent event) {
    int dx = (int) (event.getX(0) - event.getX(1));
    int dy = (int) (event.getY(0) - event.getY(1));
    return (int) (Math.sqrt(dx * dx + dy * dy));
}
public boolean onTouch(View v, MotionEvent event) {
    return false;
}
}
```

size_show.php

```
package com.zoom;
import androidx.appcompat.app.AppCompatActivity;
import android.app.Activity;
import android.content.Intent;
import android.os.Bundle;
import android.util.TypedValue;
import android.view.MotionEvent;
import android.view.View;
```

```
import android.view.View.OnTouchListener;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
public class size_show extends AppCompatActivity implements OnTouchListener {
    TextView mytv;
    String sizes30;
    Button displayResult;
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.size_main);
        displayResult = (Button) findViewById(R.id.button3);
        mytv = (TextView) findViewById(R.id.tvsize);
        Bundle bundle = getIntent().getExtras();
        sizes30 = bundle.getString("keysize30");
        mytv.setText("Text Size :  " +sizes30+"\n\n        PHASE 2 \n Place your phone at
approximately 50-60 cm from your eye sight");
        displayResult.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // mytv.setTextSize(TypedValue.COMPLEX_UNIT_PX, 12);
                Intent intent = new Intent(size_show.this, size_60.class);
                Bundle bundle = new Bundle();//Add your data to bundle
                bundle.putString("keysize_30",sizes30);
                //Add the bundle to the intent
                intent.putExtras(bundle);
                startActivity(intent);
                //Toast.makeText(getApplicationContext(), String.valueOf(text)
,Toast.LENGTH_SHORT).show();
            }
```

```
        });
    }
    @Override
    public boolean onTouch(View v, MotionEvent event) {
        return false;
    }
}
```

Result.php

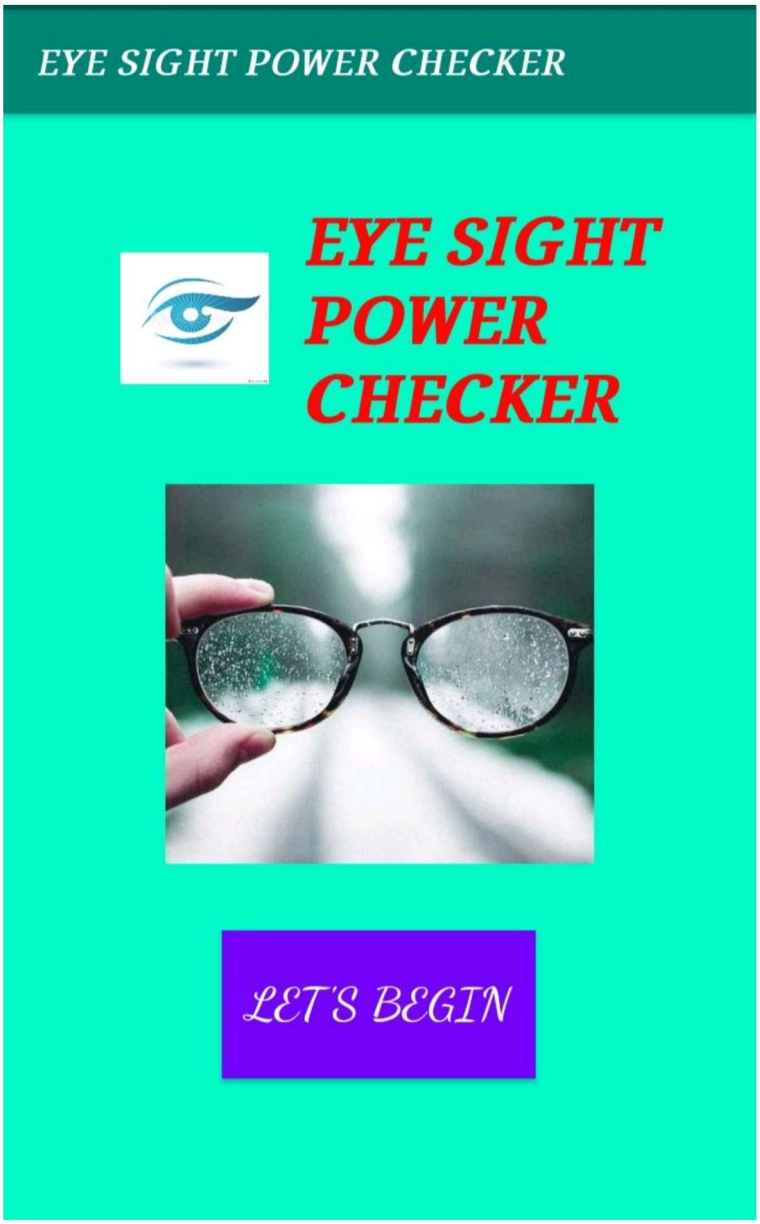
```
package com.zoom;
import androidx.appcompat.app.AppCompatActivity;
import android.app.Activity;
import android.content.Intent;
import android.os.Bundle;
import android.util.TypedValue;
import android.view.MotionEvent;
import android.view.View;
import android.view.View.OnTouchListener;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
public class result extends AppCompatActivity {
    TextView mytv;
    String sizes;
    Button displayResult;
    Double result;
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.result);
```

```
        displayResult = (Button) findViewById(R.id.button4);
        mytv = (TextView) findViewById(R.id.tvsize);
        Bundle bundle = getIntent().getExtras();
        result = bundle.getDouble("keyresult");
        mytv.setText("          Result :  \n\nAll three phases have been done\n                "+result);
        displayResult.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // mytv.setTextSize(TypedValue.COMPLEX_UNIT_PX, 12);
                Intent intent1 = new Intent(result.this, MainActivity.class);
                startActivity(intent1);
                //Toast.makeText(getApplicationContext(), String.valueOf(text)
,Toast.LENGTH_SHORT).show();
            }

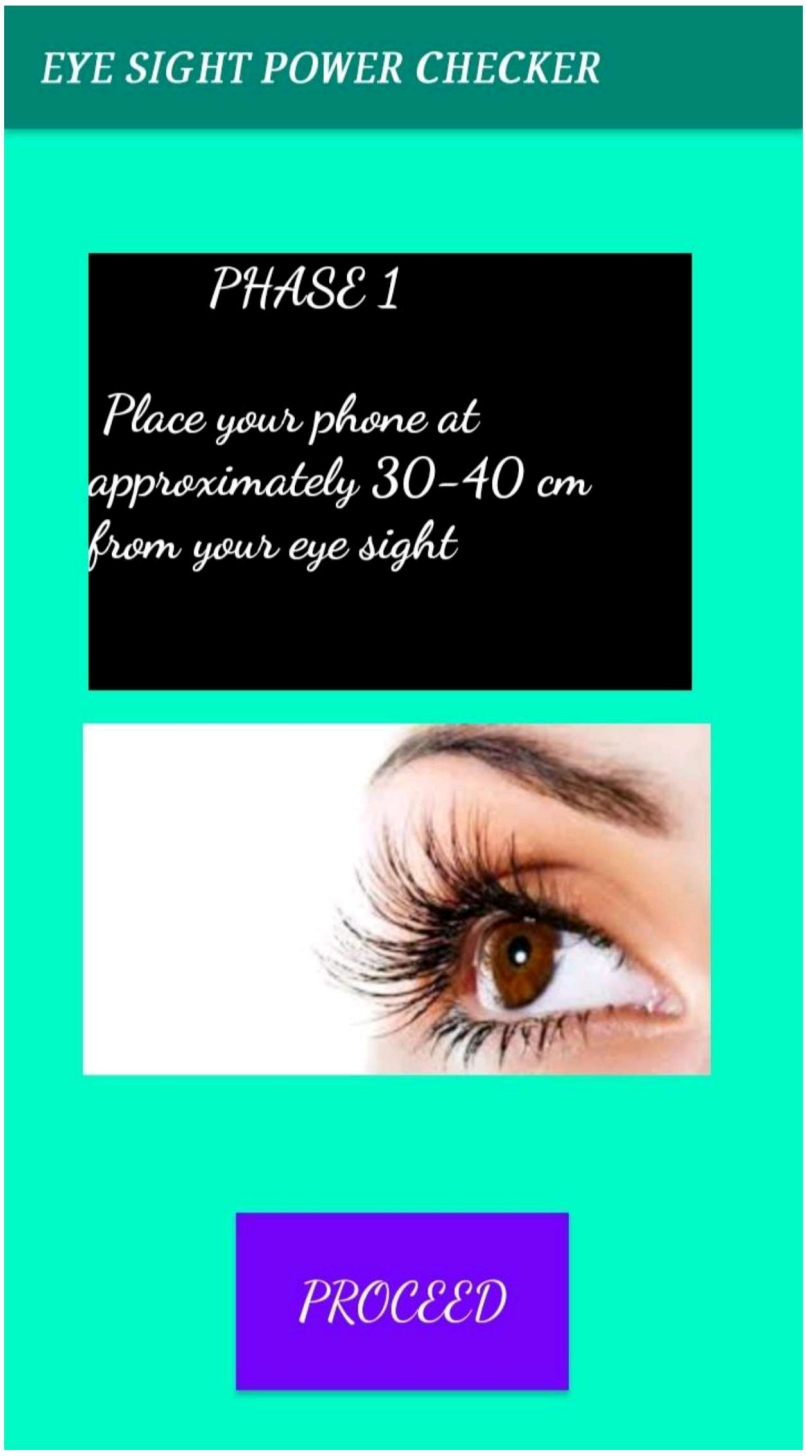

        });
    }
    @Override
    public void onBackPressed() {
        Intent intent=new Intent(result.this,MainActivity.class);
        startActivity(intent);
        finish();
    }
}
```

SCREENSHOTS

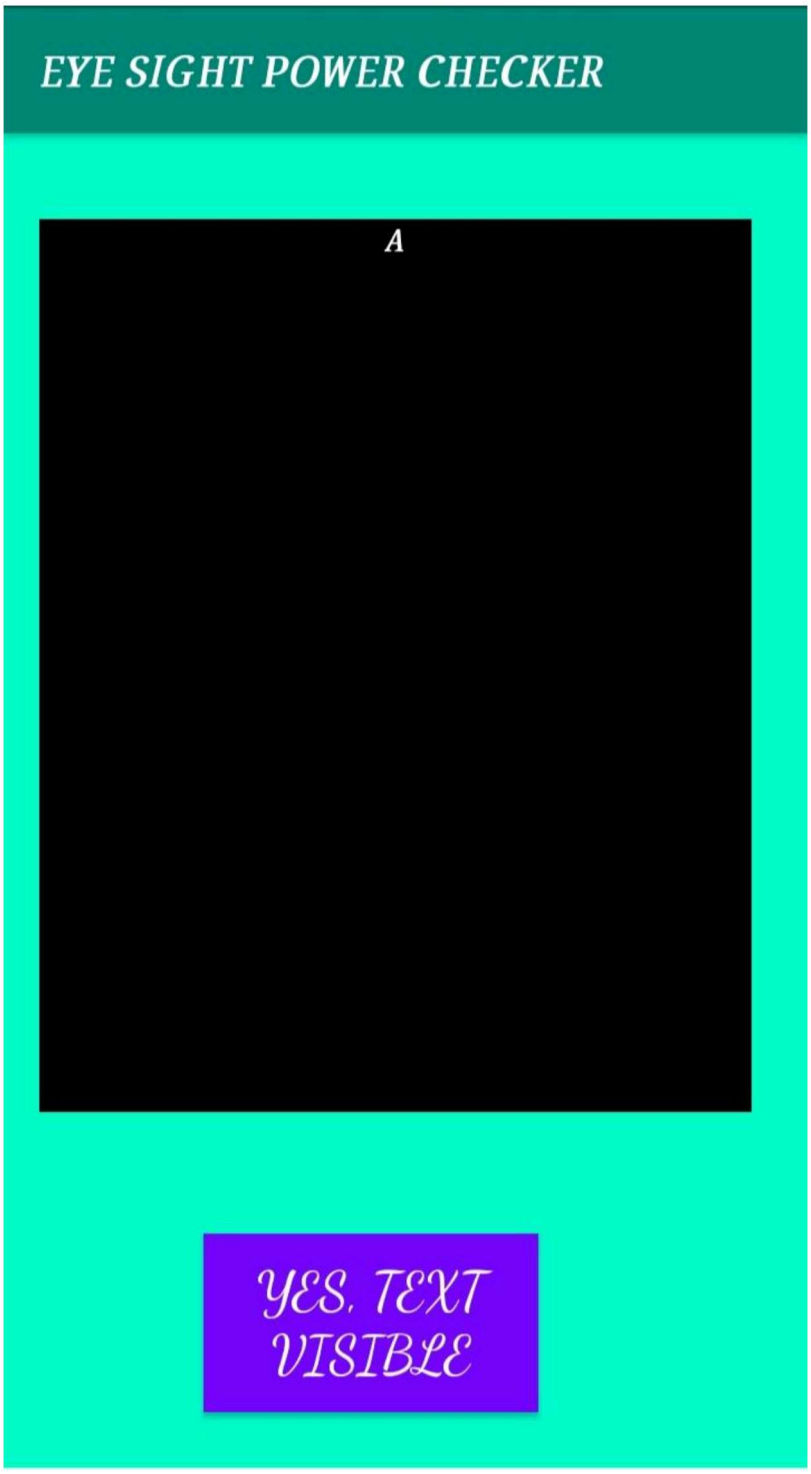
Homepage



Phase-I


EYE SIGHT POWER CHECKER
PHASE 1
Place your phone at approximately 30-40 cm from your eye sight
PROCEED

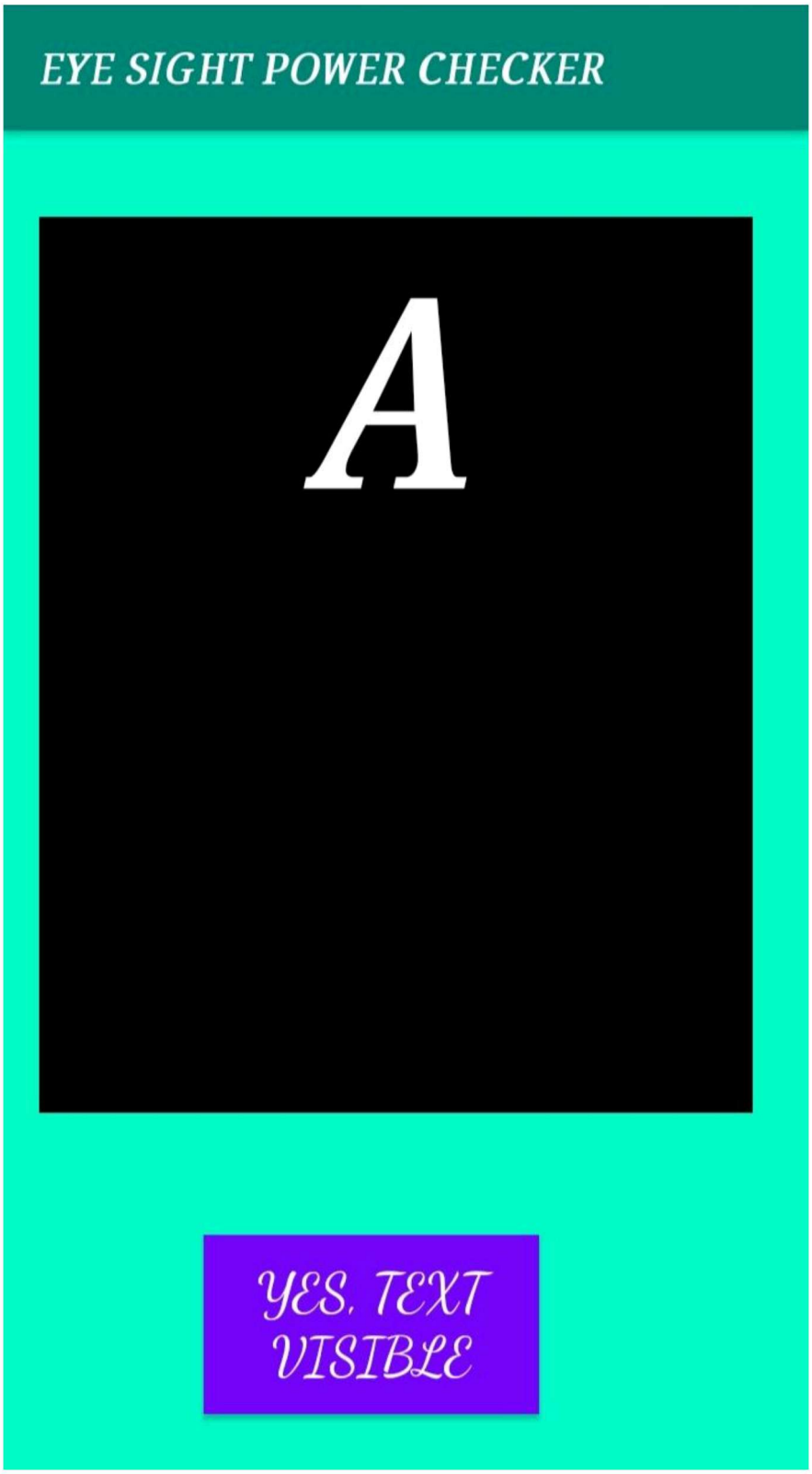
Text checking phase-I



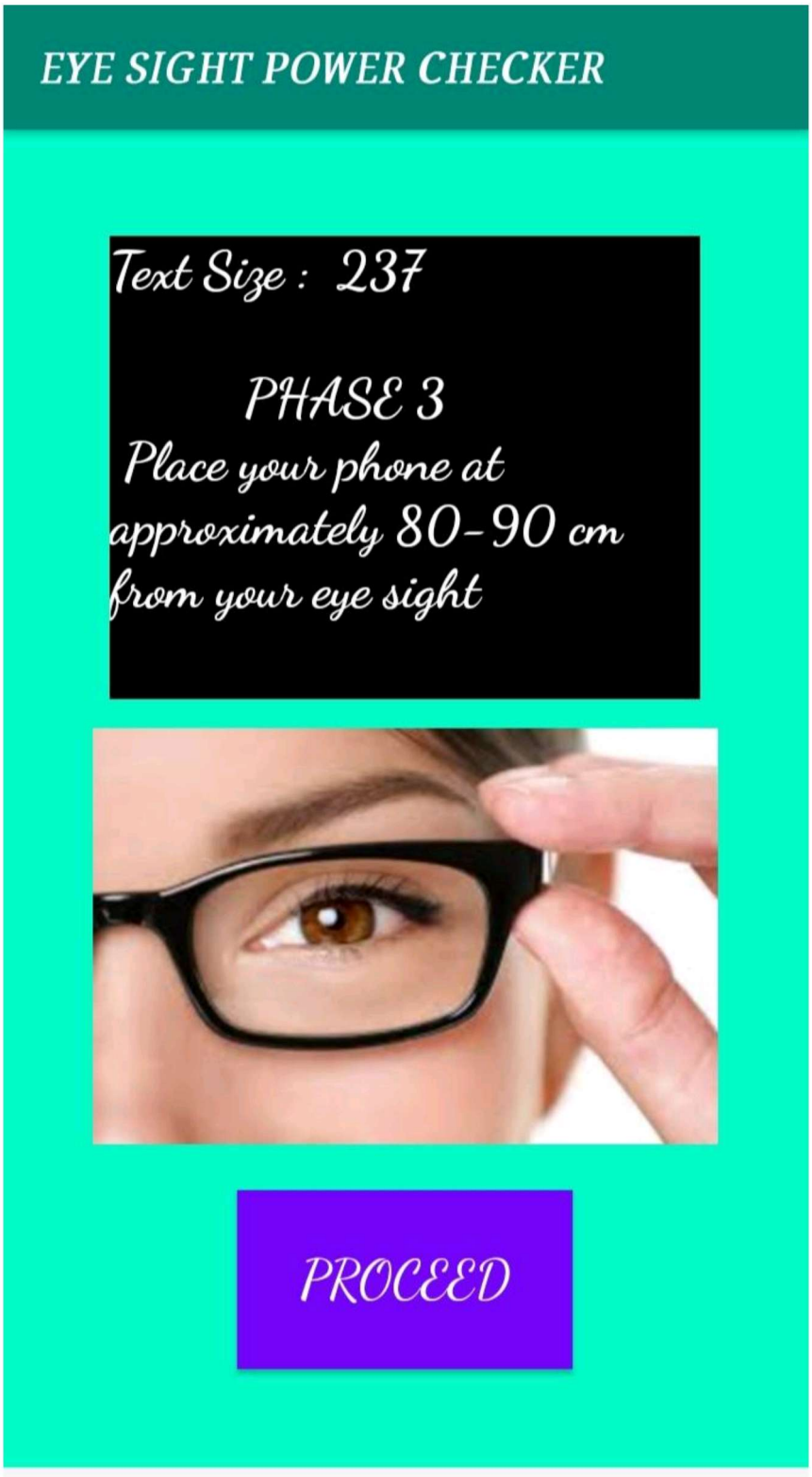
Phase-II


EYE SIGHT POWER CHECKER
Text Size : 28
PHASE 2
Place your phone at approximately 50-60 cm from your eye sight
PROCEED

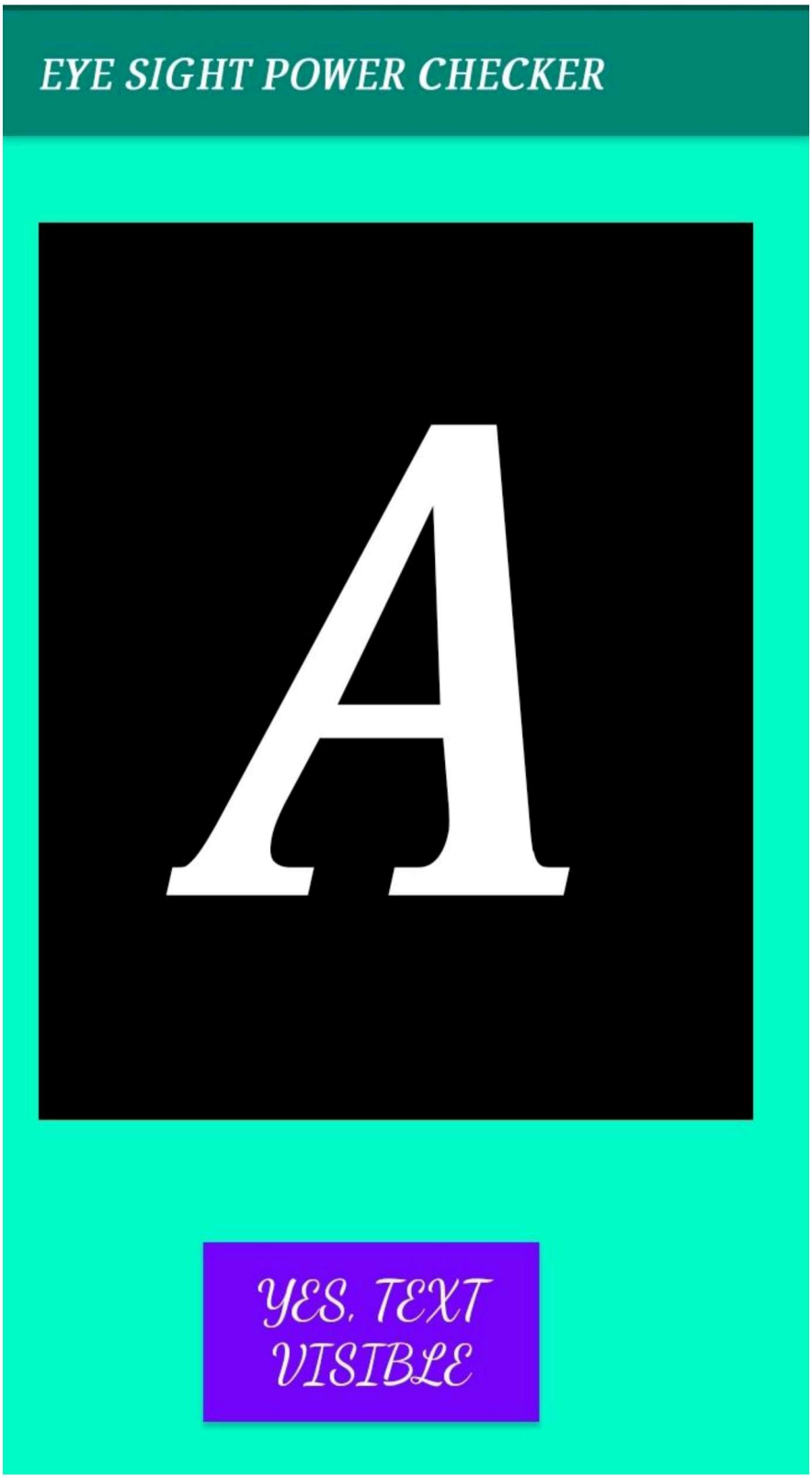
Text checking phase-II



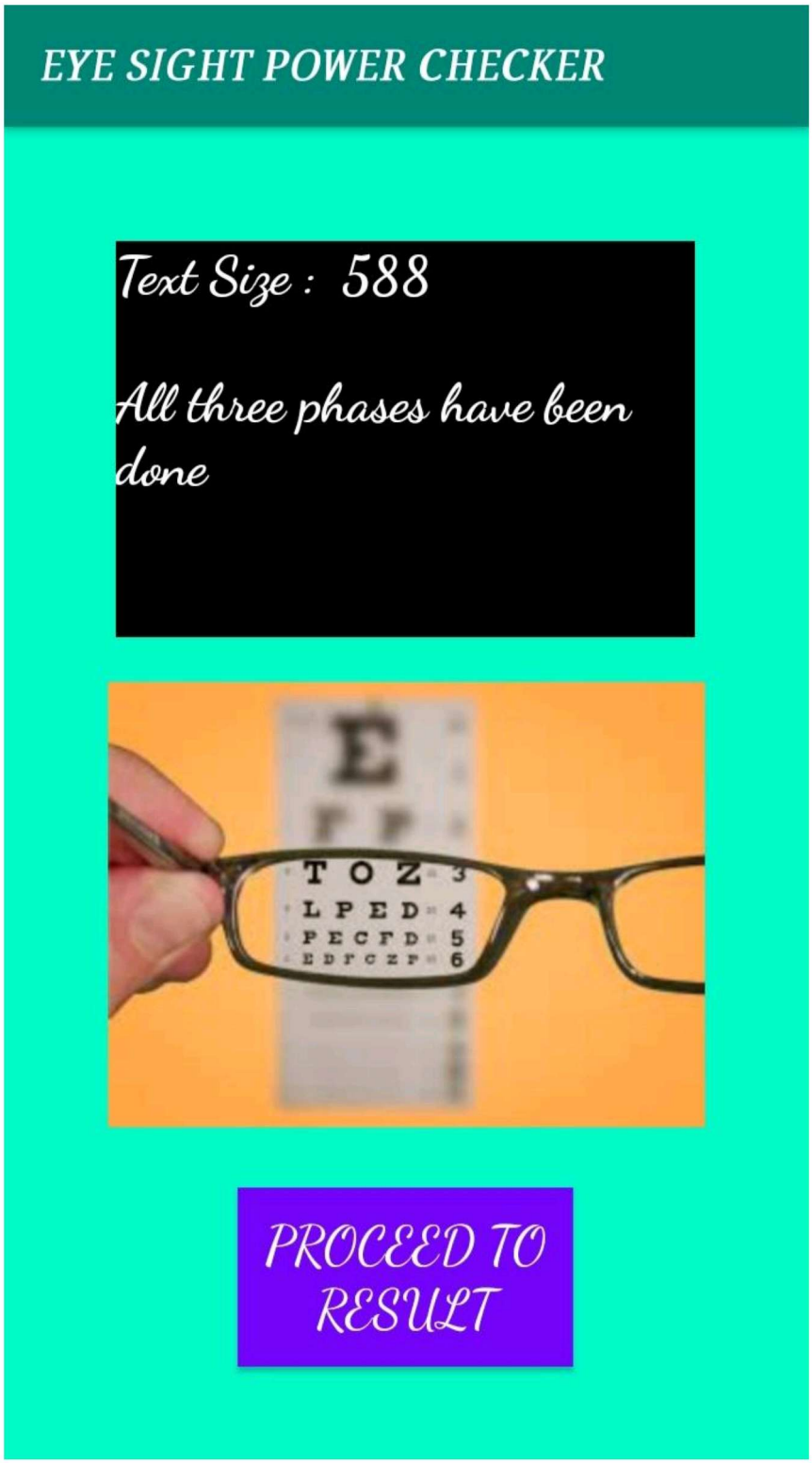
Phase-III


EYE SIGHT POWER CHECKER
Text Size : 237
PHASE 3
Place your phone at approximately 80-90 cm from your eye sight
PROCEED

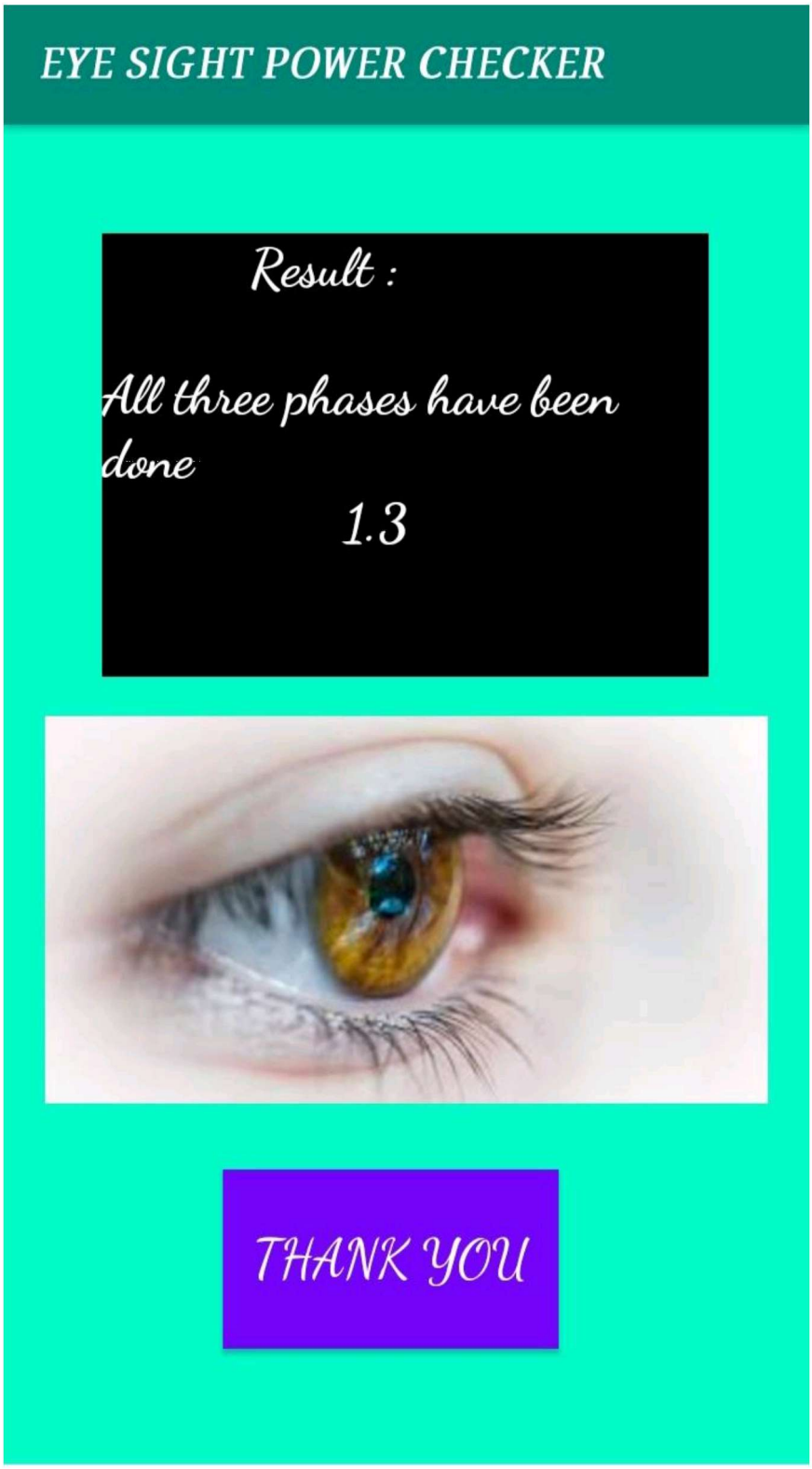
Text checking phase-III



Phase result



Final result



CONCLUSION

This project has aimed at making a prediction about the visual acuity of users via a mobile application. People can get idea about their visual acuity approximately. The project was designed to be used in Android platform.

The project was implemented for the patients who have visual impairment problem that is myopia, hypermetropia. In the welcome screen of the application, the letter is demonstrated as the user responds correctly, it moves on to another phase. If the user responds three phases, the system outputs the eyesight power to the user. According to Euclidean Distance information, the eyesight ratio can be computed.

The project was developed to be used for people with visual impairment who can benefit from this application to state their visual acuity anywhere.

In today's world, ratio of visual impairment is increasing day by day so that some solutions in order to ease doctor's workload should be found. Our model is designed to be serviced for both the doctors and people.

FUTURE ENHANCEMENT

- In future, with the necessary arrangements this mobile application will run on the iOS platform..
- Since it is a demo model, in future this project can be done with correct and exact accuracy by getting some preferable letters that are suggested by the ophthalmologists.
- In future this project can also include distance vision test, near vision test, colour vision test etc.

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Website:

1. http://www.essilor.co.uk/check-your-vision
2. http://peekvision.org/en_GB/peek-solution/peek-acuity/
3. http://www.optoplus.com/eneye-health/virtual-eye-test/
4. http://ocularcentre.com/virtual-care/visual-acuity-testing/

ANNUAL WELLNESS VISIT

A project submitted to

ST. MARY'S COLLEGE (Autonomous), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

In partial fulfilment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

M. KARIMUNISHA

Reg. No.: 20SPCS08

Under the Supervision and Guidance of

Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi-628001

MAY - 2022

CERTIFICATE

This is to certify that this project work entitled **"ANNUAL WELLNESS VISIT"** is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to **Manonmaniam Sundaranar University, Tirunelveli,** in partial fulfilment for the award of the degree of **Master of Science in Computer Science** for the work done during the year 2021-2022 by **M. KARIMUNISHA (Reg. No. 20SPCS08)**

Signature of the Guide **Signature of the Coordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do hereby declare that, the project entitled **"ANNUAL WELLNESS VISIT"** submitted for the degree of Master of Science in Computer Science is my original work carried out under the guidance of **Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET.,** Assistant Professor and Co-ordinator, PG Department of Computer Science (SSC), St. Mary's College (Autonomous), Thoothukudi.

Station: Thoothukudi **Signature of the student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to **Dr. Sr. A. S. J. Lucia Rose, Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani, Director of SSC**, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I express my hearty thanks to my guide **Ms. C. Nayanthra Mascarenhas M.Sc., M. Phil., SET., Assistant Professor and Coordinator**, PG Department of Computer Science (SSC) for her Valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I convey my heartfelt thanks to **Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor**, PG Department of Computer Science (SSC) for her support and counsel. I also express my boundless thanks to **Ms. A. Jenitta Jebamalar M.Sc. (IT), M.Sc. (CS), M.Phil., B.Ed., Assistant Professor**, PG Department of Computer Science (SSC) for her encouragement and support.

I am much indebted to **Mr. Saravanan Chandra Krishnan, CEO, Tekspear Soft** for his untiring effort, immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

ABSTRACT

The Annual Wellness Visit (AWV) is a Remote Health Care Project designed in .net core application for patients to get yearly appointments with our primary care provider (PCP) to create or update a personalised prevention plan. This prevention plan may help prevent illness based on your current health and risk factors. This is a covered visit that allows our health care provider to dedicate time for a health risk assessment and prevention/screening strategies. During this visit, your health care provider will go over your health risks, prevention and screenings only giving your provider the time needed to make sure all of your immunizations, cancer screenings and personal screenings based on risk are discussed and scheduled. Here, physicians will conduct a health risk assessment and create a personalised health plan that promotes health and prevents disease. The visits give you the opportunity to ask questions and get in-depth information. AWV is not a comprehensive physical exam.

The Annual Wellness Visit (AWV) Project allows us to create patients by adding their personal information, address information, and communication information. The problems of the patients were entered. The common problems include Diabetes, Hypertension, COPD and CHF. The additional information such as medical equipment and insurance details is also updated. After creating the patient, the list of patients will be displayed. AWV includes three major steps Clinical Intake, Questionnaires and the Provider Review. Each patient goes through the above three steps and at last the reports of the patient will be generated. By doing this, the provider may discover or treat a new or existing problem. AWV is not a comprehensive physical exam. This visit includes a review of your medical and social history related to your health and education and counselling about preventive services, including certain screenings, flu and pneumococcal shots, and referrals for other care, if needed. Height, weight, and blood pressure measurements.

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INTRODUCTION

Intelligent Healthcare Delivered from the Cloud

The patient care journey is traditionally a fragmented one, especially for more complex cases or chronic conditions that involve multiple healthcare providers and clinical specialists. As a result, a patient's critical health data may be stored and siloed across disparate IT systems or in outdated pen-and-paper systems.

Remote Cares was founded to solve this challenge. Remote Cares is transforming the healthcare space with its unified platform for health management, which collects and consolidates data from clinical management systems, medical devices, and patients in real time into a single view and protects it with modern encryption standards. It also provides intelligent healthcare, with built-in risk stratification tools, care plan templates, continuous monitoring of vitals, smart algorithms, and data analytics.

Real-Time Remote Consultation with Telehealth

One of the headline features of Remote Cares is its Telehealth platform, a highly popular video-conferencing solution that connects healthcare providers with patients to offer remote consultations - whether in one-on-one sessions or in conferences of up to 100 people.

Preventive services

Preventive care is care you receive to prevent illness, detect medical conditions, and keep you healthy. Medicare Part B covers many preventive services, such as screenings, vaccines, and counselling. Remote Care's intuitive platform is a one-stop wellness program built to help practices get compliant, patients get the most out of proactive care, and practitioners get time back in their days to focus on connecting and providing excellent care. It's HIPAA compliant and covers more facets of Medicare preventive care than any other platform.

Our most popular software solutions allow practices to effectively manage these Medicare programs in their office with their staff. We'll provide the tools and training. You provide the clinical resources. Medicare Programs supported through our platform include:

- Chronic Care Management
- Remote Patient Monitoring
- Annual Wellness Visits

SYSTEM SPECIFICATIONS

PROJECT PROFILE

Project Title	:	**'Annual Wellness Visit'**
Organization	:	**Tekspear Soft**
Developed by	:	M. Karimunisha
Duration	:	14 February 2022
Internal Guide	:	Ms. Nayanthra Mascarenhas

PROJECT TOOLS

Front-end Tools	:	Visual Studio 2019
Back-end Tools	:	Microsoft SQL Server Management Studio
Web API	:	Rest API
Platform	:	Windows

SOFTWARE REQUIREMENTS

Operating System	:	Windows 10
Application Front-end Tools	:	UI
Database Back-end Tools	:	Entity Framework Core

INSTALLATION PROCEDURE

Step 1 - Make sure your computer is ready for Visual Studio

Before you begin installing Visual Studio:

1. Check the system requirements. These requirements help you know whether your computer supports Visual Studio 2019.
2. Apply the latest Windows updates. These updates ensure that your computer has both the latest security updates and the required system components for Visual Studio.
3. Reboot. The reboot ensures that any pending installs or updates don't hinder your Visual Studio install.
4. Free up space. Remove unneeded files and applications from your system drive by, for example, running the Disk Clean up app.

Step 2 - Download Visual Studio

Next, download the Visual Studio bootstrapper file.

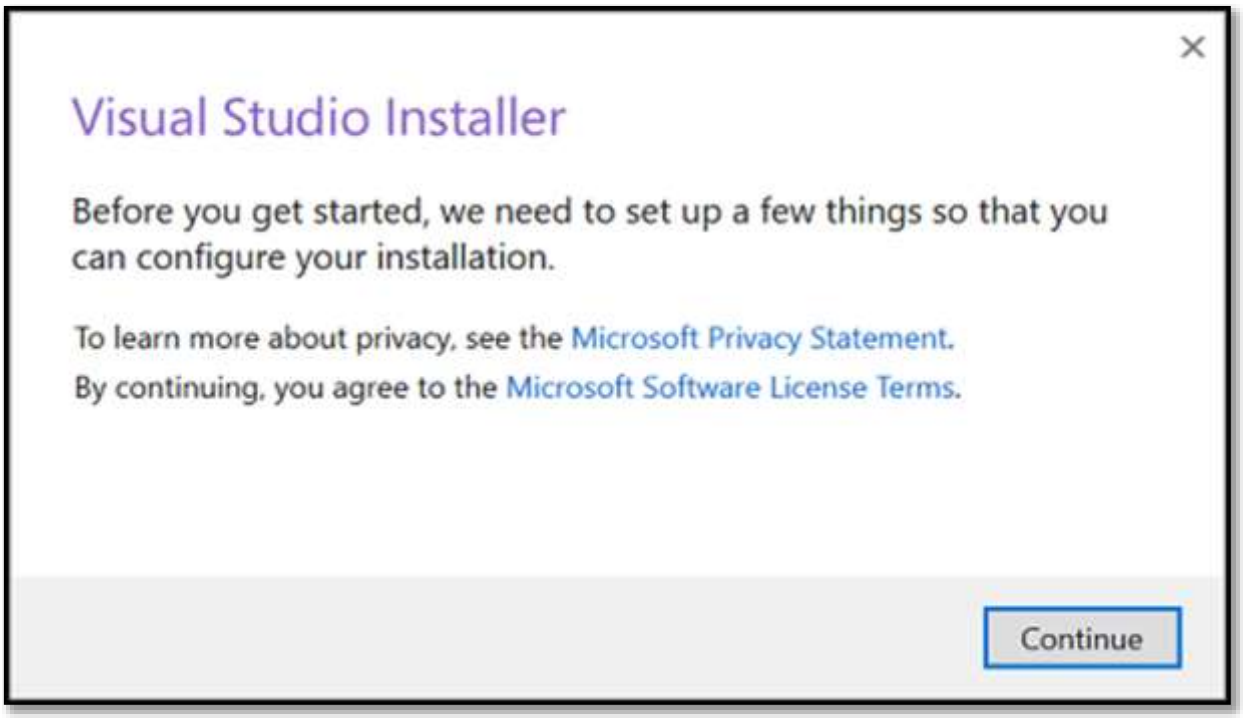
To do so, choose the following button, choose the edition of Visual Studio that you want, choose Save, and then choose the Open folder.

Download Visual Studio

Step 3 - Install the Visual Studio Installer

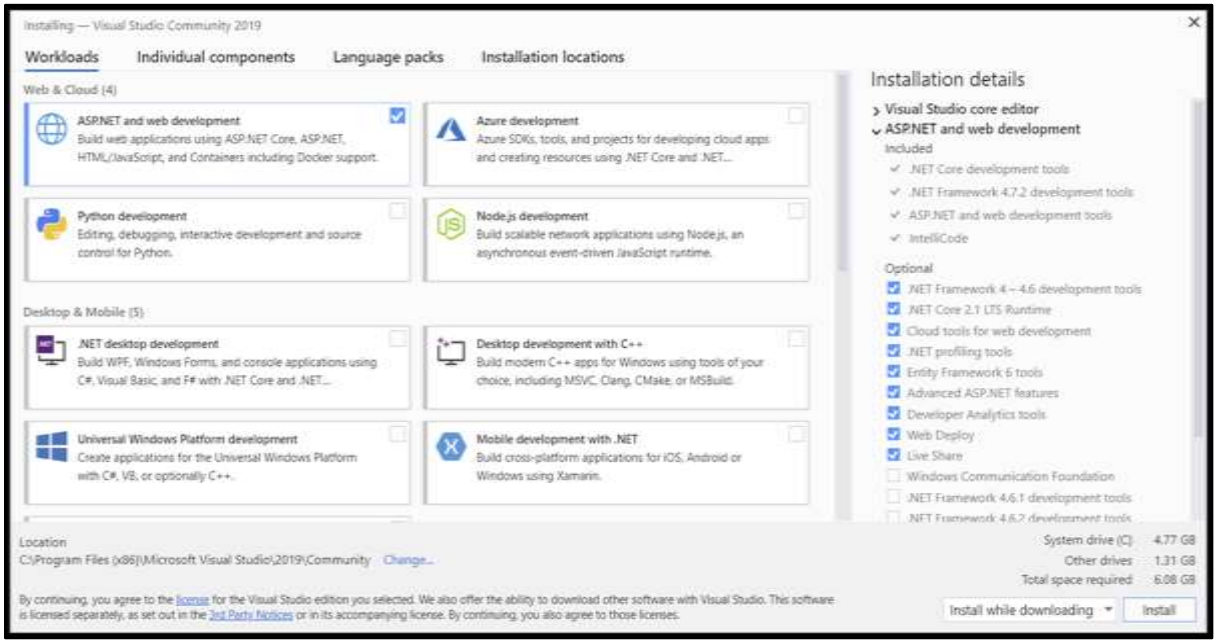
Run the bootstrapper file to install the Visual Studio Installer. This new lightweight installer includes everything you need to both install and customise Visual Studio.

1. From your Downloads folder, double-click the bootstrapper that matches or is similar to one of the following files:
    - ✓ vs_community.exe for Visual Studio Community
    - ✓ vs_professional.exe for Visual Studio Professional
    - ✓ vs_enterprise.exe for Visual Studio Enterprise
2. If you receive a User Account Control notice, choose, yes.
3. We'll ask you to acknowledge the Microsoft Licence Terms and the Microsoft Privacy Statement. Choose Continue



Step 4 - Choose workloads

After the installer is installed, you can use it to customise your installation by selecting the feature sets—or workloads—that you want. Here's how.



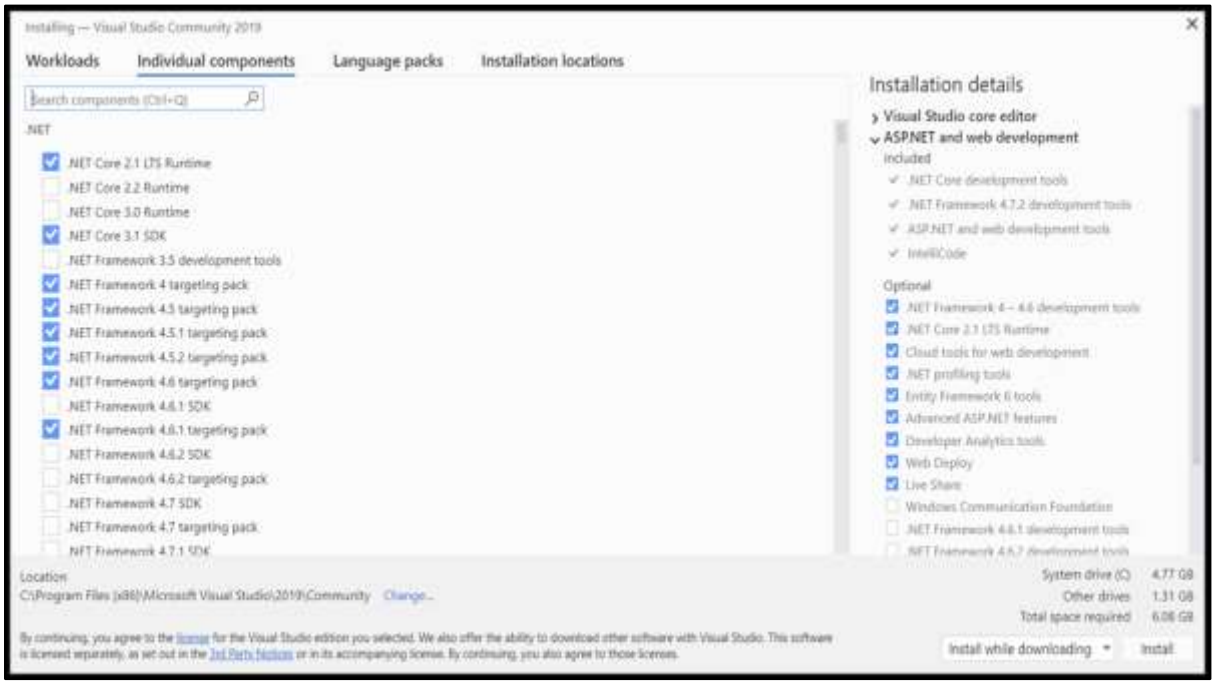
1. Find the workload you want in the Visual Studio Installer.
2. For example, choose the "ASP.NET and web development" workload. It comes with the default core editor, which includes basic code editing support for over 20 languages,

the ability to open and edit code from any folder without requiring a project, and integrated source code control.

3. After you choose the workload(s) you want, choose Install.
4. Next, status screens appear that show the progress of your Visual Studio installation.

Step 5 - Choose individual components (optional)

If you don't want to use the Workloads feature to customise your Visual Studio installation, or you want to add more components than a workload installs, you can do so by installing or adding individual components from the Individual components tab. Choose what you want, and then follow the prompts.



Step 6 - Install language packs

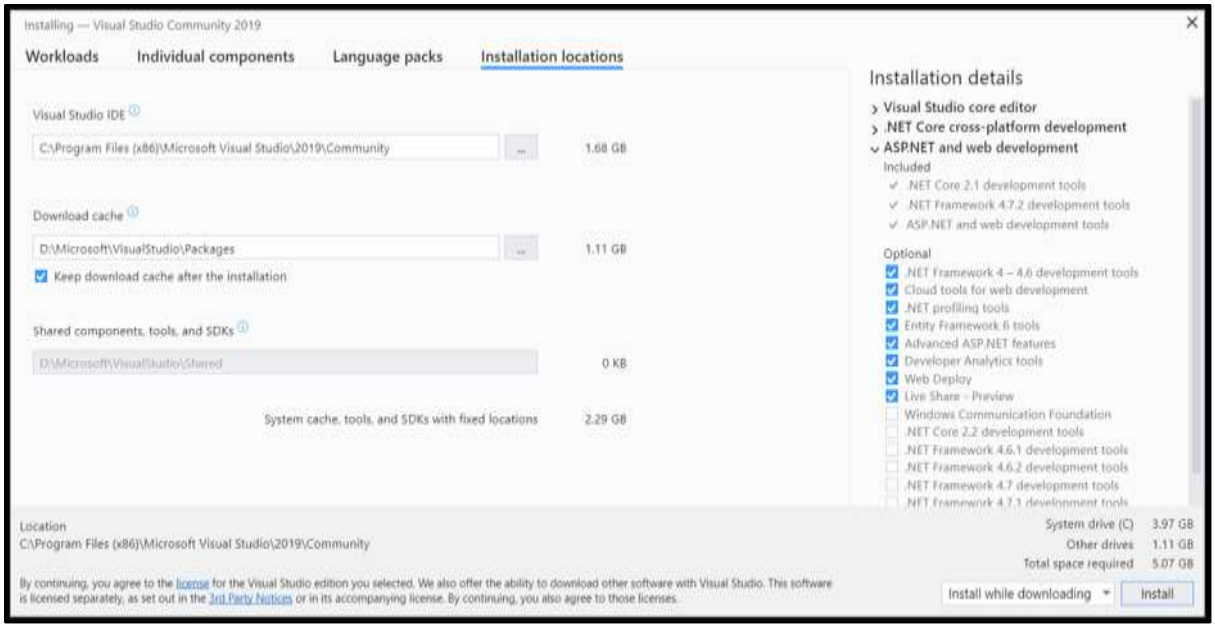
By default, the installer program tries to match the language of the operating system when it runs for the first time. To install Visual Studio in a language of your choosing, choose the Language packs tab from the Visual Studio Installer, and then follow the prompts.

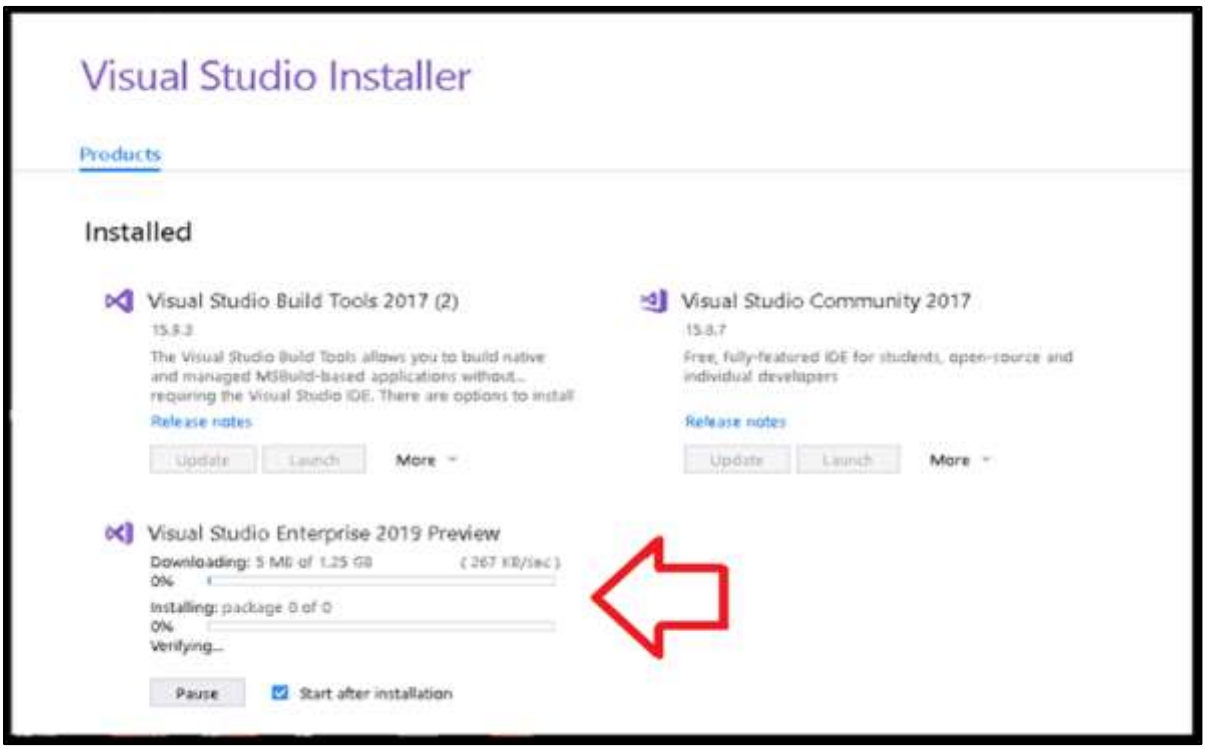
Change the installer language from the command line

Another way that you can change the default language is by running the installer from the command line. For example, you can force the installer to run in English by using the following command: vs_installer.exe --locale en-US. The installer will remember this setting when it is run the next time. The installer supports the following language tokens: zh-cn, zh-tw, cs-cz, and en-us, es-es, fr-fr, de-de, it-it, ja-jp, ko-kr, pl-pl, pt-br, ru-ru, and tr-tr.

Step 7 - Select the installation location (optional)

You can reduce the installation footprint of Visual Studio on your system drive. You can choose to move the download cache, shared components, SDKs, and tools to different drives, and keep Visual Studio on the drive that runs it the fastest.



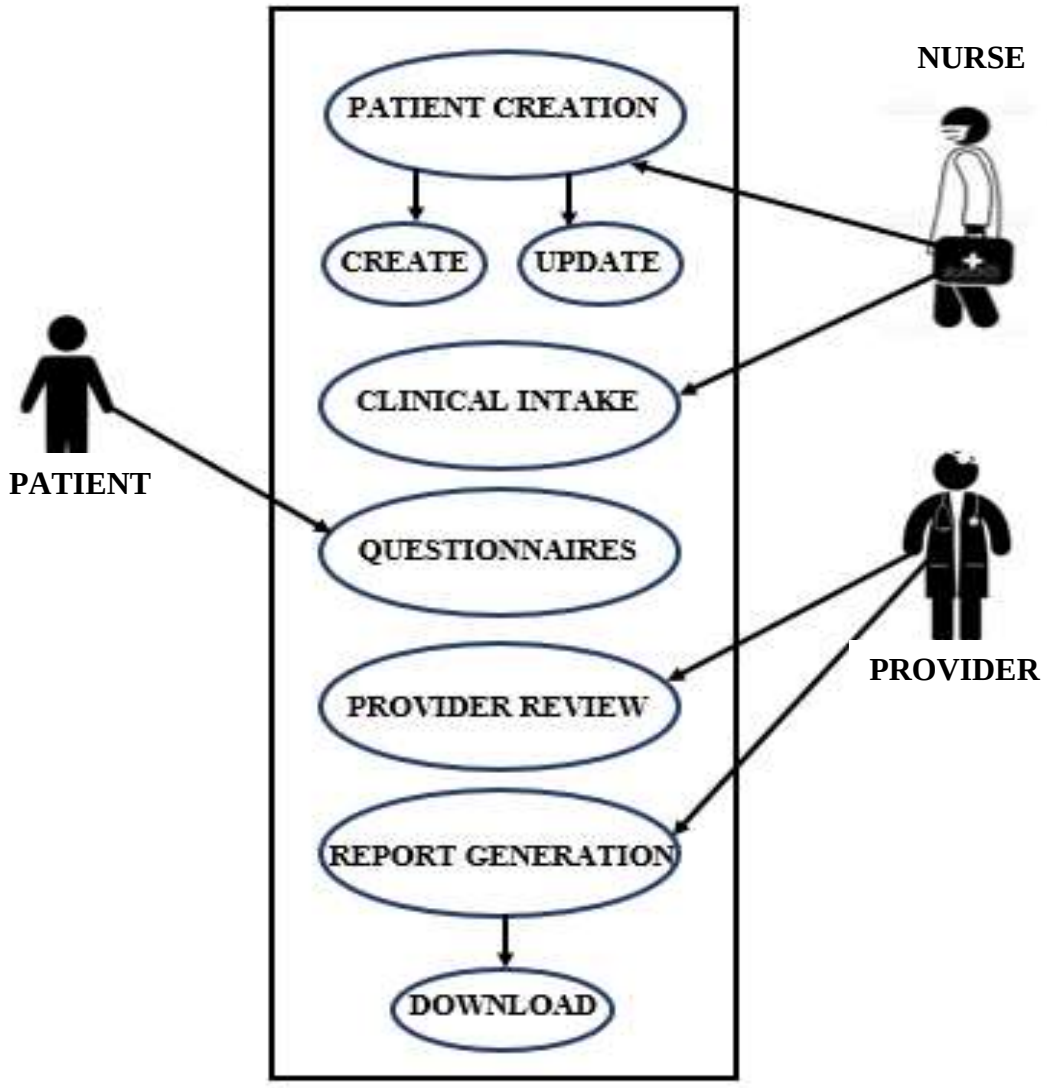


Step 8 - Start developing

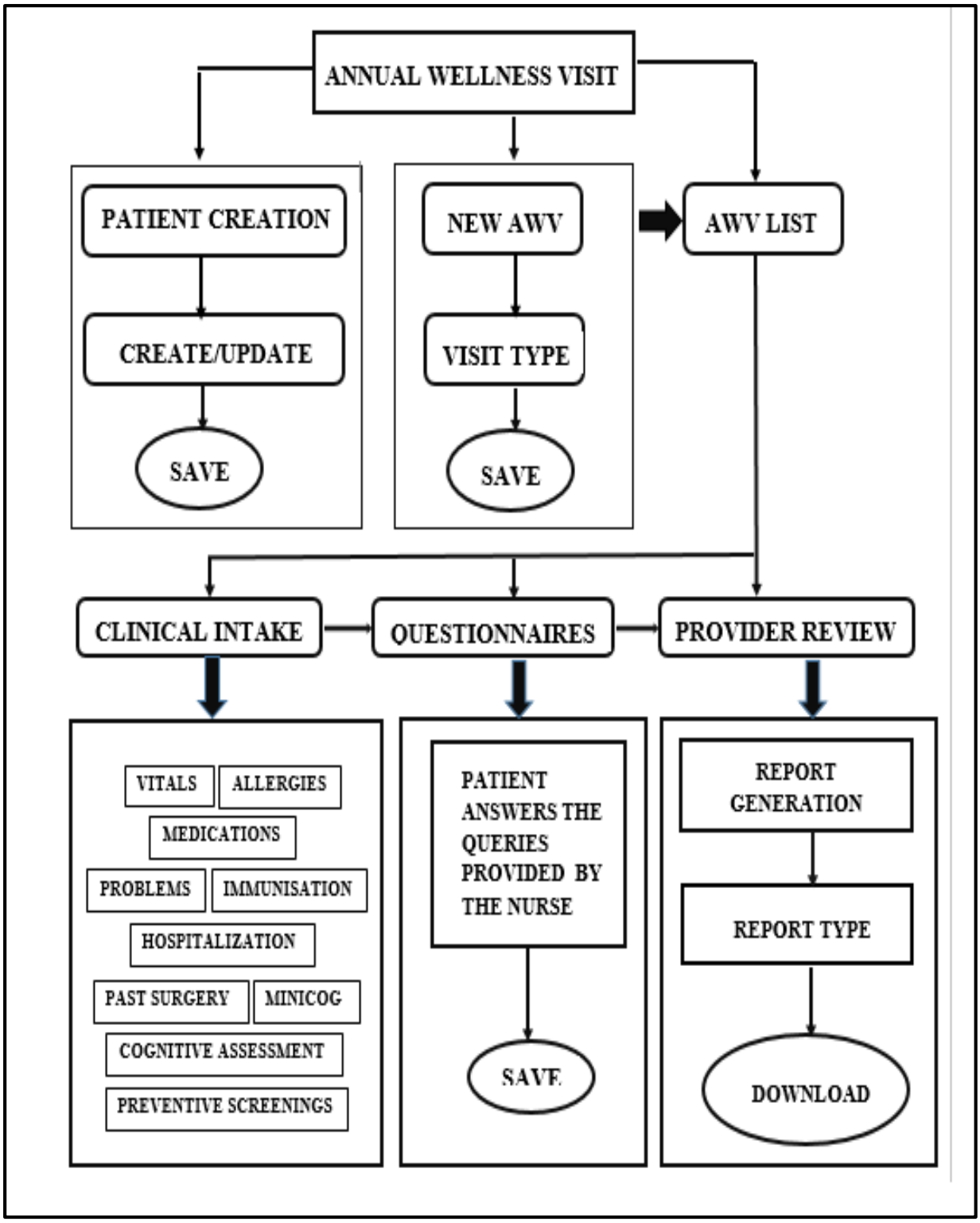
1. After Visual Studio installation is complete, select the **Launch button** to get started developing with Visual Studio.
2. On the start window, choose Create a new project.
3. In the search box, enter the type of app you want to create to see a list of available templates. The list of templates depends on the workloads that you chose during installation. To see different templates, choose different workloads.
4. You can also filter your search for a specific programming language by using the Language drop-down list. You can filter by using the Platform list and the Project type list, too.
5. Visual Studio opens your new project, and you're ready to code.

SYSTEM DESIGN

USE-CASE DIAGRAM



ENTITY RELATIONSHIP DIAGRAM



PROJECT DESCRIPTION

The Annual wellness visit is a covered visit that allows a patient's health care provider to dedicate time for a health risk assessment and prevention/screening strategies. During this visit, the patient's health care provider will go over the health risks, prevention and screenings only – giving the patient's provider the time needed to make sure all of the immunizations, cancer screenings and personal screenings based on risk are discussed and scheduled.

The patient's physician will conduct a health risk assessment and create a five to 10-year personalised health plan that promotes health and prevents disease. The visits give patients the opportunity to ask questions and get in-depth information.

The Annual wellness visit is not a comprehensive physical exam. But if patient have a certain Medicare Advantage Plan, patient can schedule a physical exam and a wellness visit for the same appointment with their provider

ELIGIBILITY

Medicare Part B covers the Annual Wellness Visit if:

- Patient had Part B for over 12 months
- And, patient have not received an AWV in the past 12 months

Additionally, the patient cannot receive their AWV within the same year as their Welcome to Medicare preventive visit.

COVERED SERVICES

During their first Annual Wellness Visit, their PCP will develop their personalised prevention plan and their PCP may also:

- Check their height, weight, blood pressure, and other routine measurements
- Give patient a health risk assessment
  - ✓ This may include a questionnaire that patients complete before or during the visit. The questionnaire asks about their health status, injury risks, behavioural risks, and urgent health needs.
- Review their functional ability and level of safety
  - ✓ This includes screening for hearing impairments and their risk of falling.
  - ✓ Their doctor must also assess their ability to perform activities of daily living (such as bathing and dressing), and their level of safety at home.
- Learn about their medical and family history
- Make a list of their current providers, durable medical equipment (DME) suppliers, and medications
  - ✓ Medications include prescription medications, as well as vitamins and supplements patient may take
- Create a written 5-10 year screening schedule or check-list
  - ✓ Their PCP should keep in mind their health status, screening history, and eligibility for age-appropriate, Medicare-covered preventive services
- Screen for cognitive impairment, including diseases such as Alzheimer's and other forms of dementia
  - ✓ Medicare does not require that doctors use a test to screen patients. Instead, doctors are asked to rely on their observations and/or on reports by patients and others.
- Screen for depression
- Provide health advice and referrals to health education and/or preventive counselling services aimed at reducing identified risk factors and promoting wellness
  - ✓ Health education and preventive counselling may relate to weight loss, physical activity, smoking cessation, fall prevention, nutrition, and more.

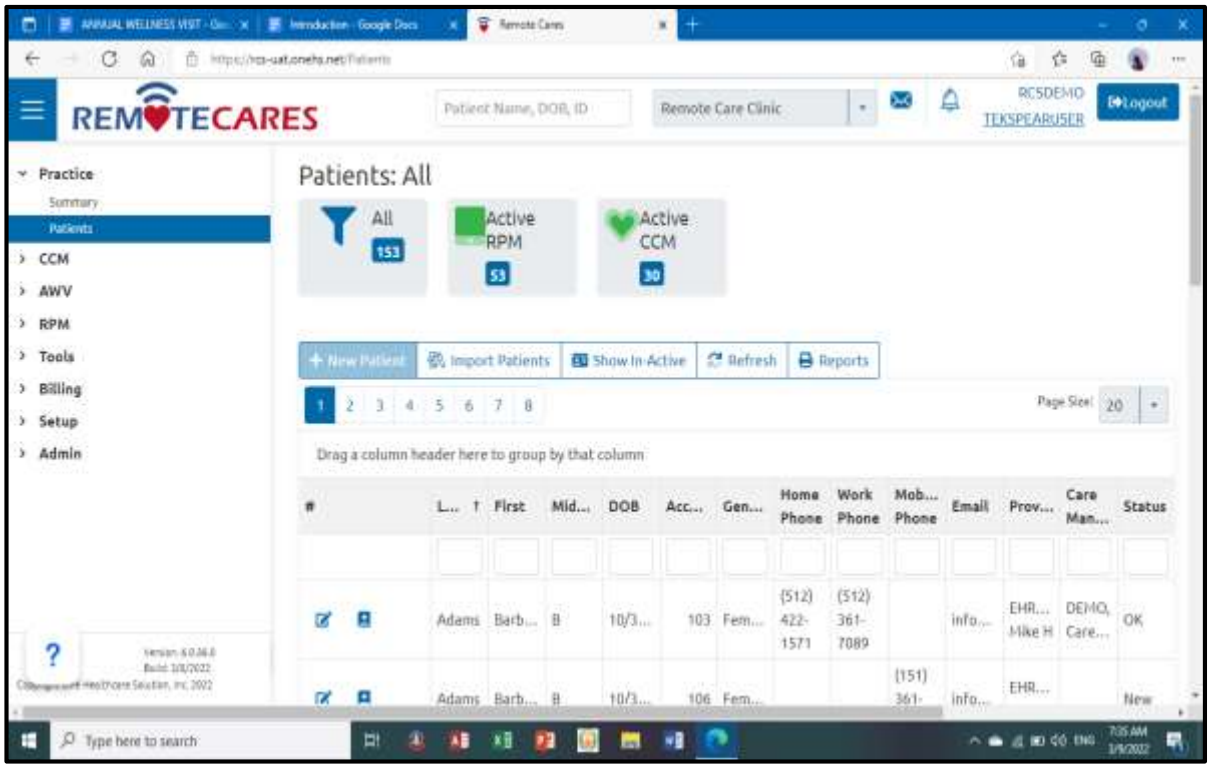
AWVs after their first visit may be different. At subsequent AWVs, their doctor should:

- Check their weight and blood pressure
- Update the health risk assessment patient completed
- Update their medical and family history
- Update their list of current medical providers and suppliers
- Update their written screening schedule
- Screen for cognitive issues
- Provide health advice and referrals to health education and/or preventive counselling services

CREATION OF PATIENTS:

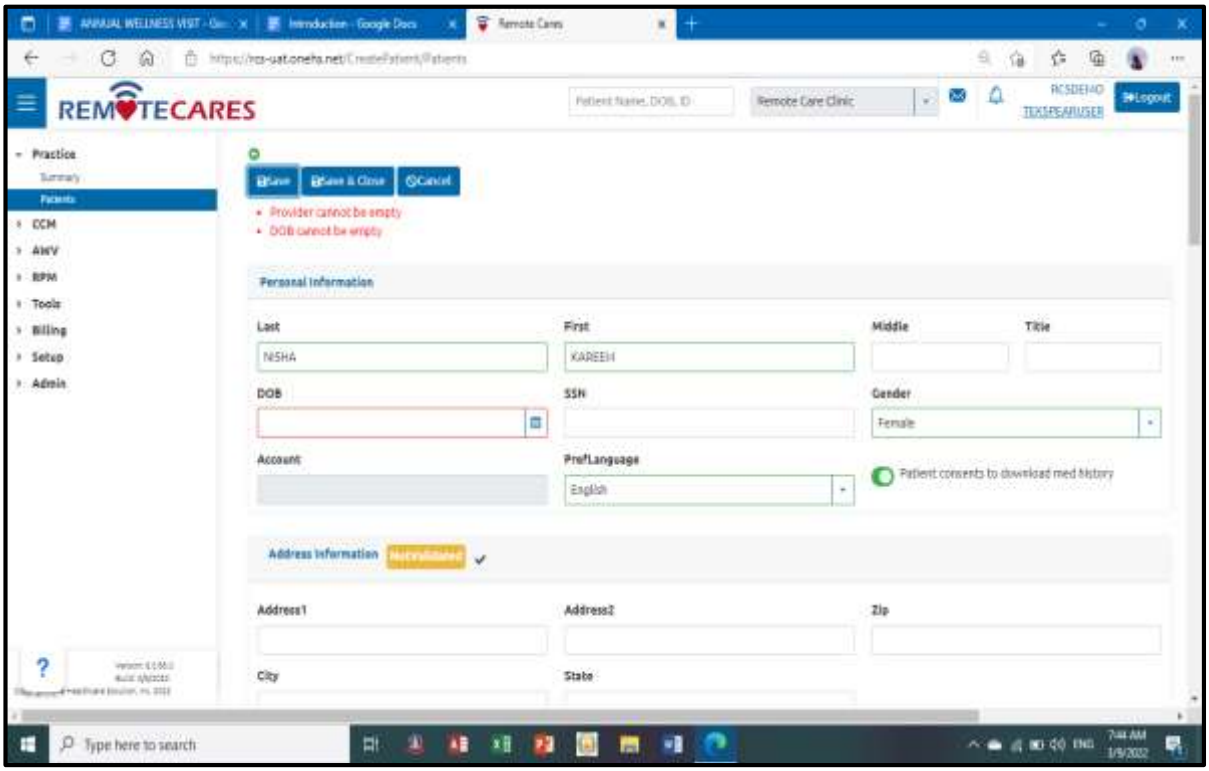
Patient information can be found by clicking the **"Patient"** link in the navigation menu. From the main "Patient" page users are able to access patient summaries, create new patients, and edit existing patients, bulk import patients from an EMR or other third party

To create a new patient, users will find the blue "New Patient" button at the upper right of the "Patients" page.

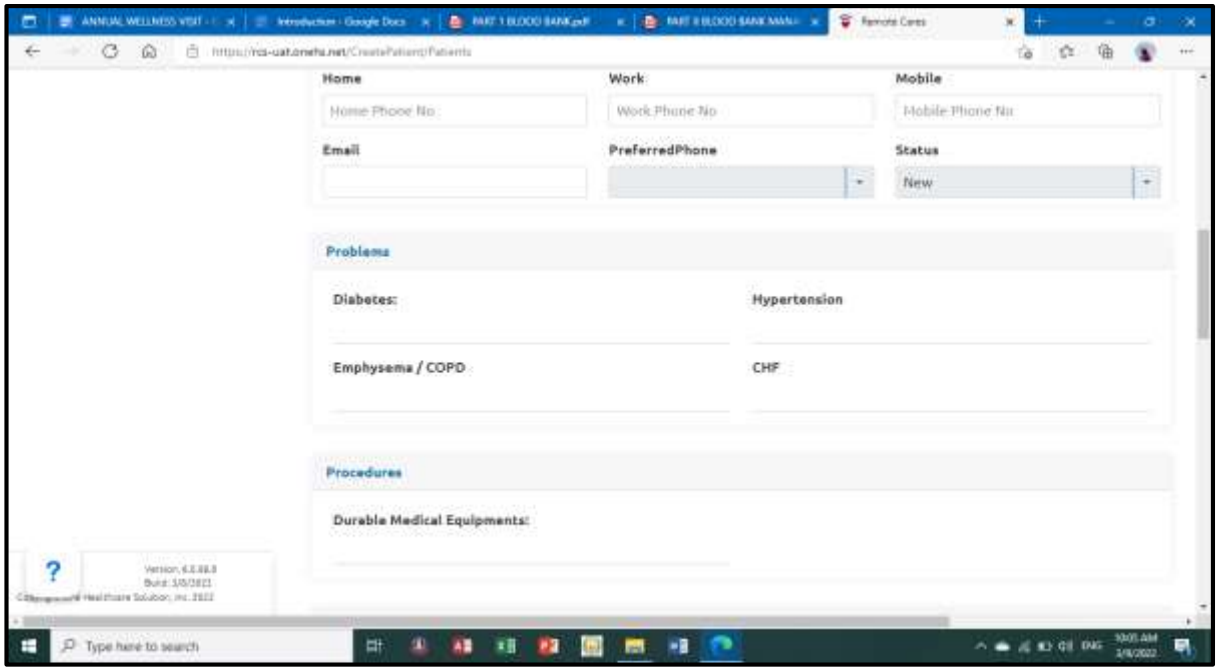


This will launch the "Create New Patient" wizard. Users will go through all three groups (Patient Information, Contact Information, Insurances) entering the appropriate information to establish the patient.

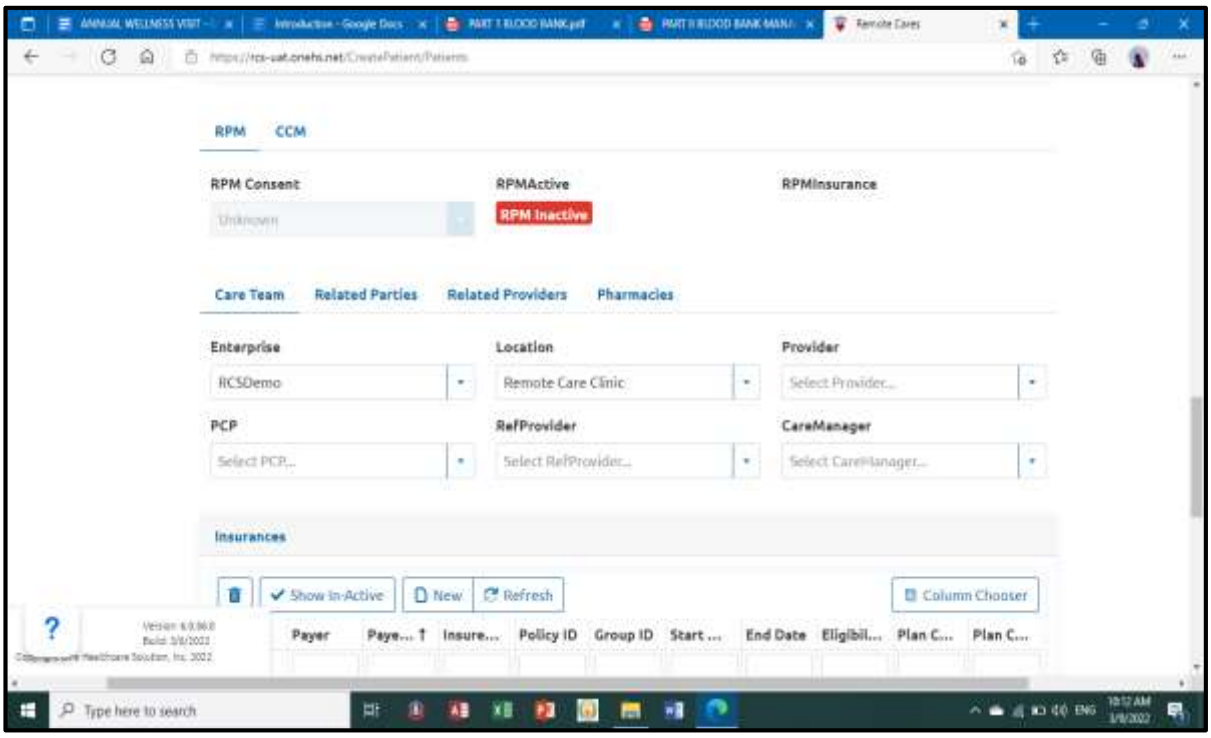
A red dot (.) denotes information that is required in order to advance through the wizard. The more information that is provided in these steps, the more accurate the eligibility and billing recommendations will be.



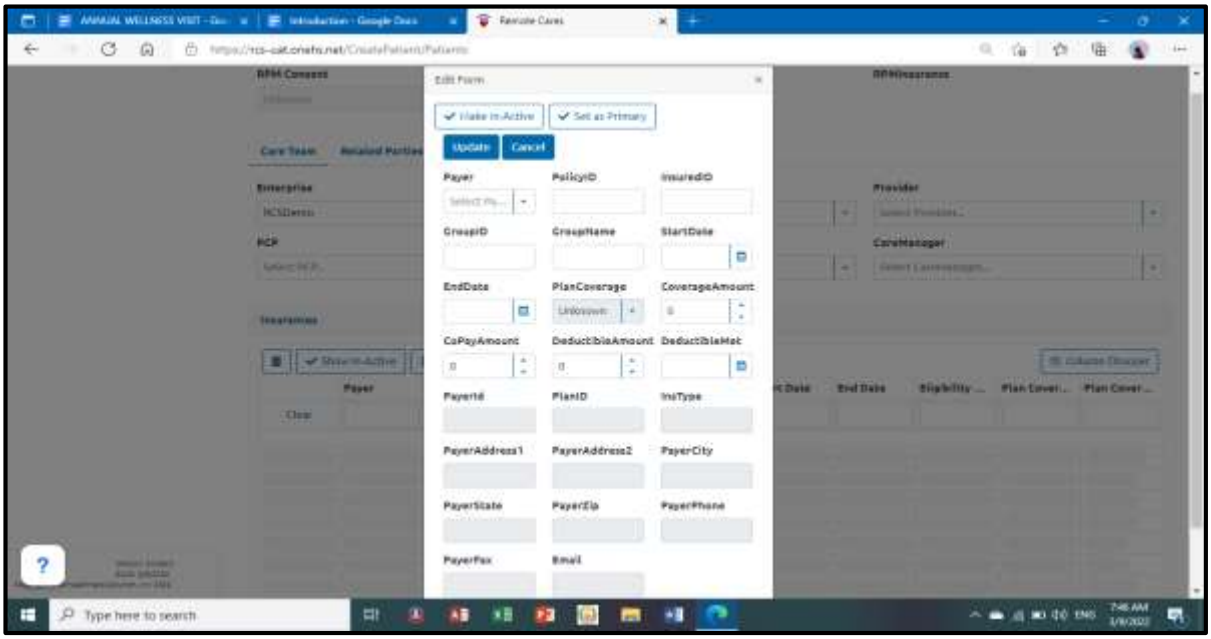
After providing the patient information, the problems and procedures will be asked. The common problems include Diabetes, Hypertension, COPD and CHF. This will require the problems faced by the patients. Procedures include medical equipment used by the patients. These details were given for more understanding about the patient.



Then, the details of the Care Team, Related parties, Related Providers and Pharmacies were entered. In the Care team menu, the name of the Enterprise, Provider and Care Manager were given. The Related Parties menu includes the details of the parties, Related Providers includes the details of the providers and the Pharmacies include the details of the pharmacy store etc.



Within the “Insurances" tab, users should be sure to enter all medical insurance policies that the patient has. This will prompt a screen requesting identifying information about the insurance policy.



It is important that users click the blue “Update” button at the bottom right of the wizard. Insurance policies can be added until all of the patient’s information is in the system.

When finished, users will click the blue **“Save”** button in the bottom right of the wizard to finalise the creation of the new patient.

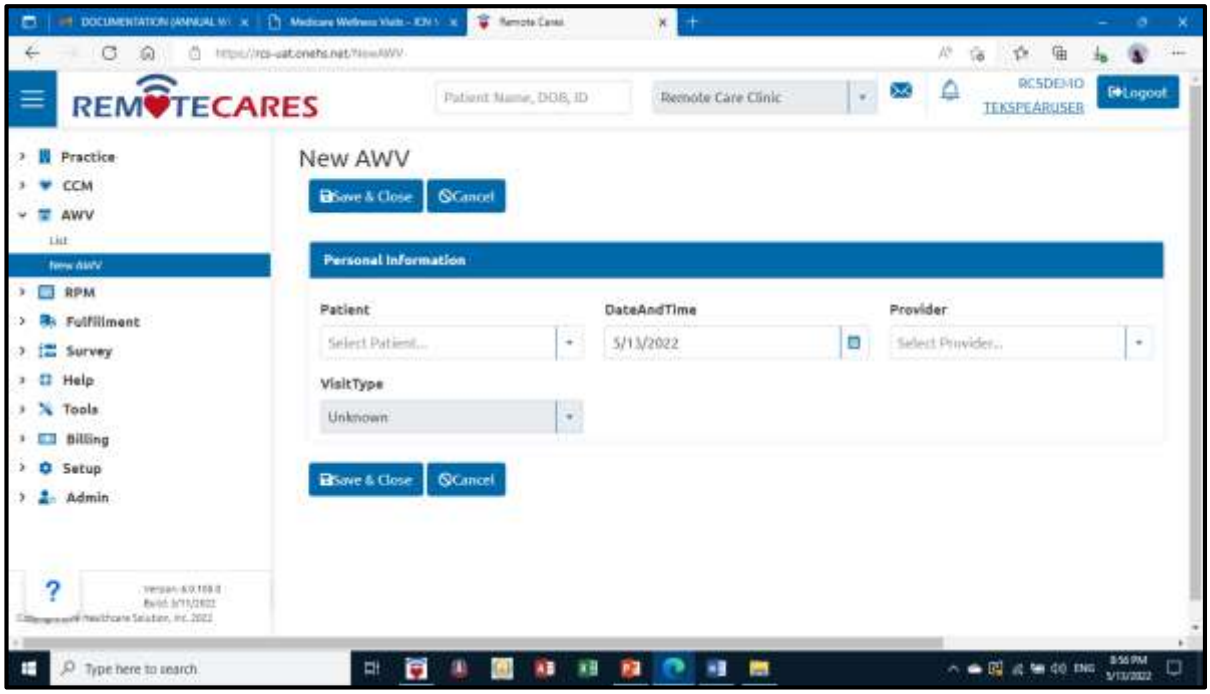
Annual Wellness Visit:

The module AWV consists of two menus:-

- New AWV
- List

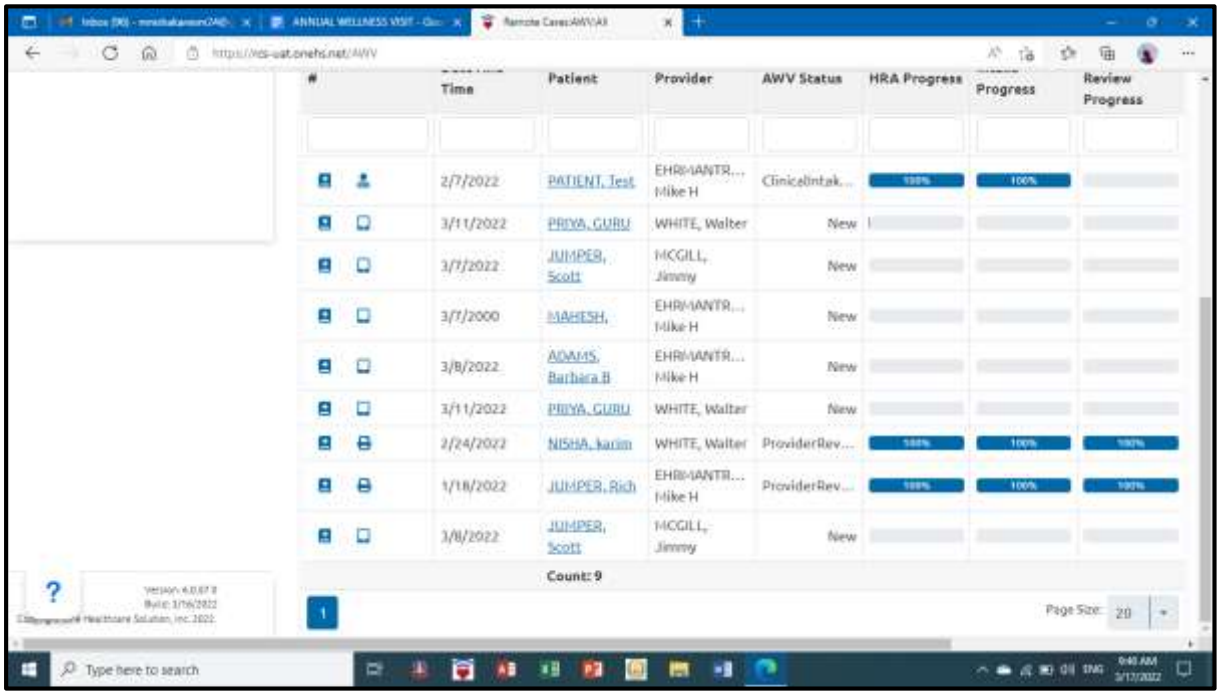
New AWV:

The New AWV menu enables us to select the AWV Patient from the list of patients created above. We can select the patients, provider and visit type with the correct date and time. After giving all the details, click the save button at the bottom left corner. This will create the AWV Patient.



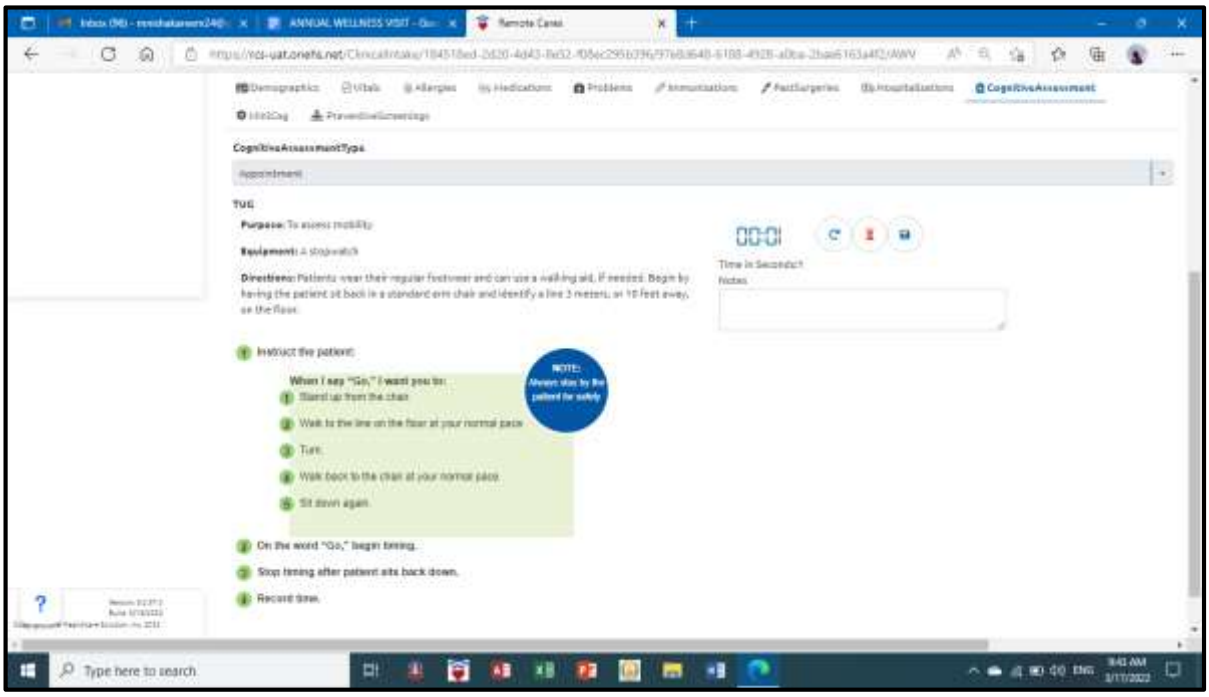
List:

In the list menu, the patients chosen for AWV will be listed with their details. Here the patients will undergo two processes namely Clinical Intake and Questionnaires.

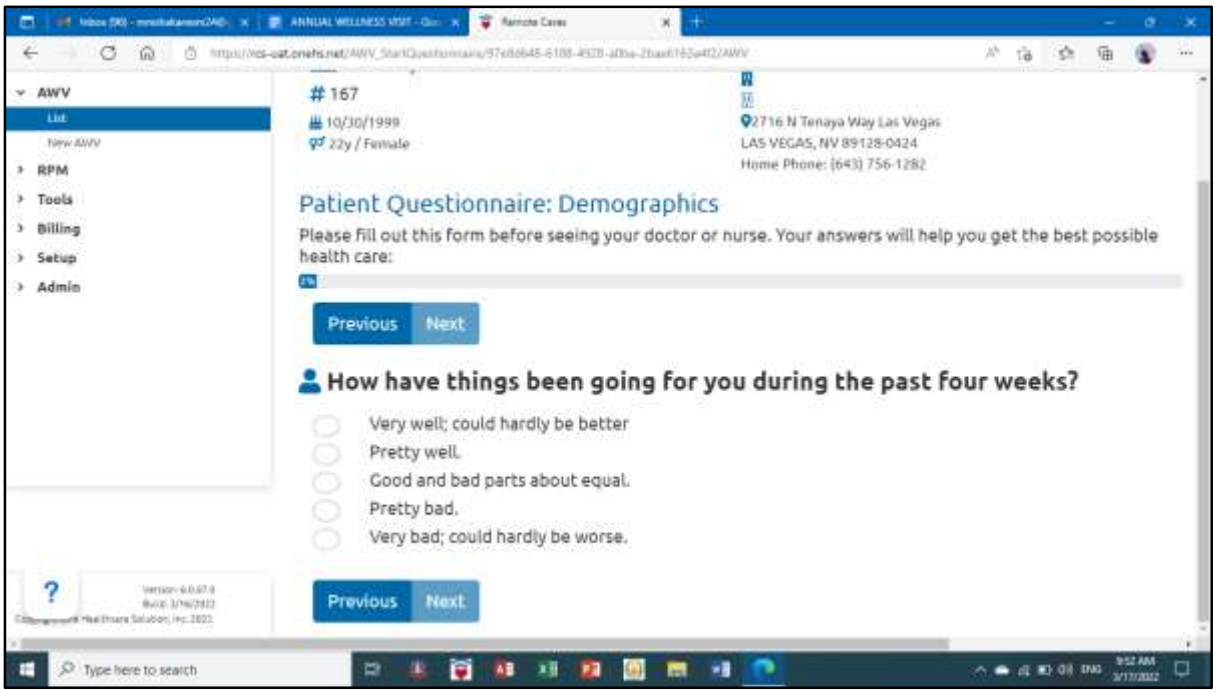


The Clinical Intake process will be taken by the nurse and she will enter the medication details, allergies and details about past surgeries of the patient.

Clinical Intake also includes a process called cognitive assessment and minicog which helps to understand better about the patient.

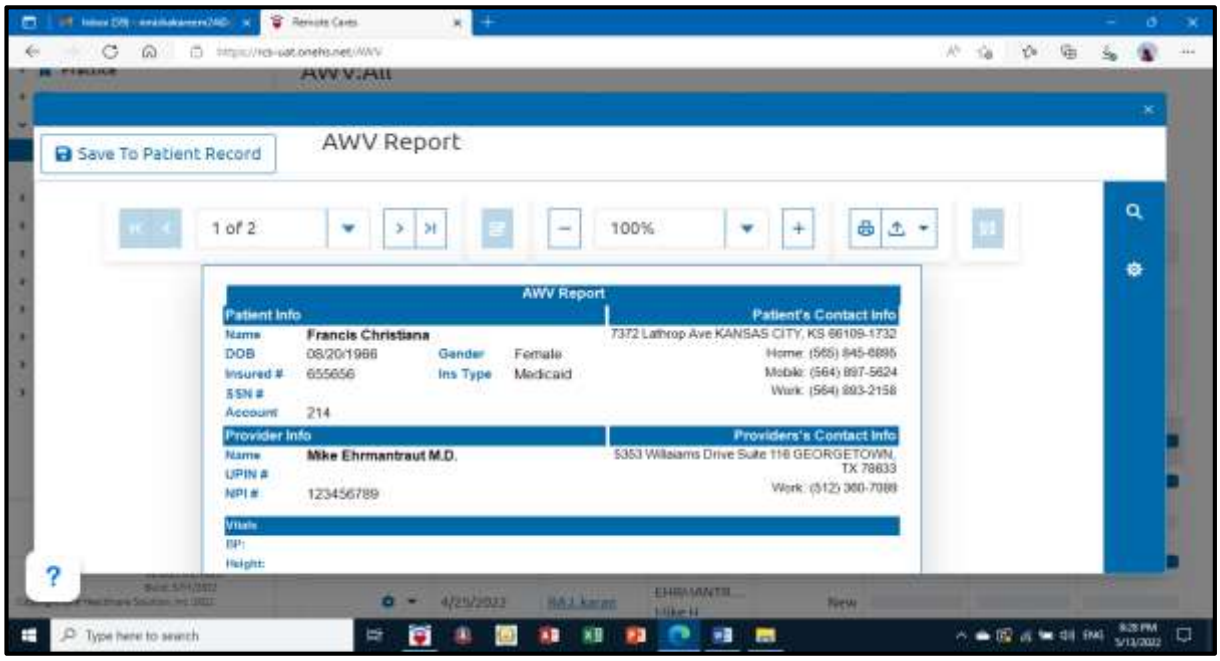


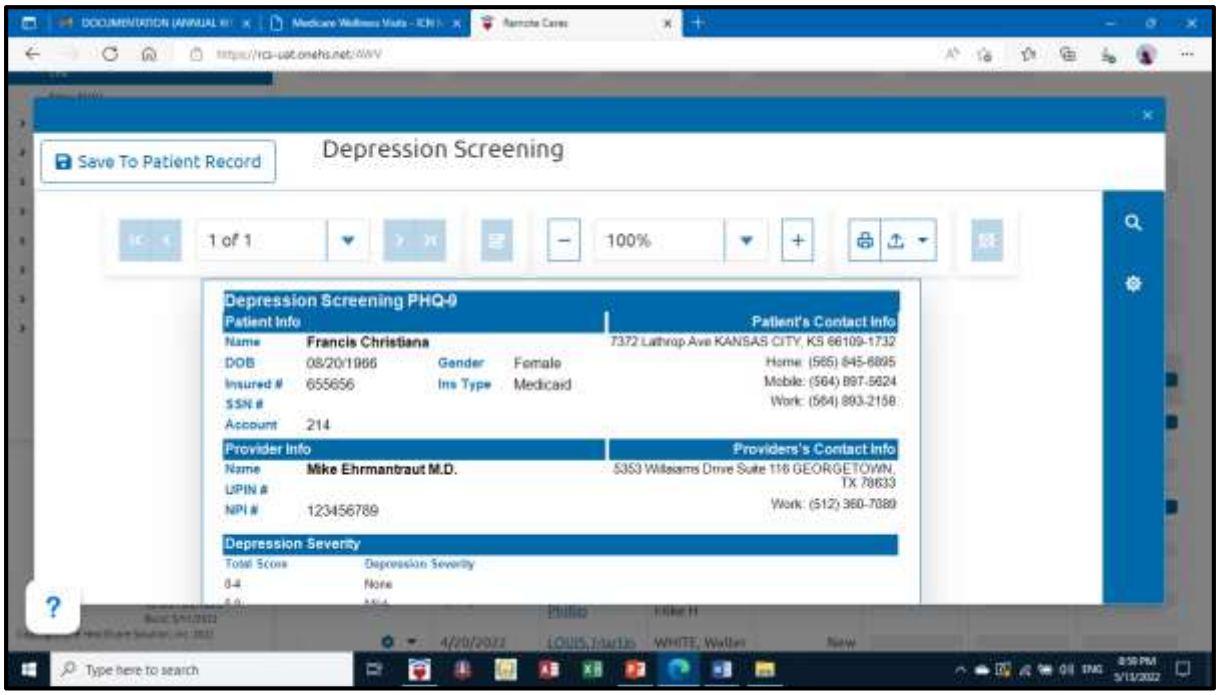
Then, the Questionnaires process will be taken by the patient. Here, the list of 15-30 questions were asked to know about the state of mind of the patient. The common questions were asked about smoking, drinking etc.



After the completion of the above two processes, the report will be generated based on the Clinical Intake and Questionnaires process.

This report will be viewed by the Provider and he will sign it. After the provider review gets complete, the report can be downloaded and this report will get saved in the patient's record.




Save To Patient Record
Depression Screening
1 of 1
100%
Depression Screening PHQ-9
Patient Info
Name Francis Christiana
DOB 08/20/1966
Gender Female
Insured # 655656
Ins Type Medicaid
SSN #
Account 214
Patient's Contact Info
7372 Lathrop Ave KANSAS CITY, KS 66109-1732
Home: (565) 845-6895
Mobile: (564) 897-5624
Work: (564) 893-2158
Provider Info
Name Mike Ehrmantraut M.D.
UPIN #
NPI # 123456789
Providers's Contact Info
5353 Williams Drive Suite 116 GEORGETOWN, TX 78633
Work: (512) 360-7389
Depression Severity
Total Score
Depression Severity
0-4
None
Type here to search

DATABASE DESCRIPTION

PATIENT TABLE:

Column Name	Data Type	Allow Null
Oid	Uniqueidentifier	UnChecked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
PlannedDate	Datetime	Checked
HealthRiskAssessment	Uniqueidentifier	Checked
Vitals	Uniqueidentifier	Checked
SkipVitals	Bit	Checked
AWVStatus	int	Checked
HRAStatus	int	Checked
EmailSentOn	datetime	Checked
HRACompletedOn	datetime	Checked
ClinicalIntakeOn	datetime	Checked
ProviderReviewedOn	datetime	Checked
VitalsReviewed	datetime	Checked
AllergiesReviewed	datetime	Checked
MedicationsReviewed	datetime	Checked
ProblemsReviewed	datetime	Checked
RelatedProvidersReviewed	datetime	Checked
FamilyHistoryReviewed	datetime	Checked
PastSurgeriesReviewed	datetime	Checked
HospitalizationsReviewed	datetime	Checked
BalanceTestReviewed	datetime	Checked
CognitiveTestReviewed	datetime	Checked
PreventiveScreeningReviewed	datetime	Checked
TUGTestDuration	int	Checked
TUGTestNotes	nvarchar(1000)	Checked
WordSetIndex	int	Checked
Word1Correct	bit	Checked
Word2Correct	bit	Checked
Word3Correct	bit	Checked
CanDrawClock	bit	Checked
ChartIntakeStepId	numeric(10,0)	Checked
TotalSteps	numeric(10,0)	Checked
ProviderReviewStepId	numeric(10,0)	Checked
ProviderReviewTotalSteps	numeric(10,0)	Checked
VisitType	int	Checked

VITALS TABLE

Column Name	Data Type	Allow Null
Oid	Uniqueidentifier	Unchecked
Template	Uniqueidentifier	Checked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
Systolic	int	Checked
Diastolic	int	Checked
SystolicSupine	int	Checked
DiastolicSupine	int	Checked
SystolicSitting	int	Checked
DiastolicSitting	int	Checked
SystolicStanding	int	Checked
DiastolicStanding	int	Checked
Temp	float	Checked
HR	int	Checked
Respiration	int	Checked
O2	float	Checked
O2Classification	int	Checked
HeightMeters	float	Checked
WeightKg	float	Checked
HeadCircumference	float	Checked
OD	nvarchar(100)	Checked
OS	nvarchar(100)	Checked
OU	nvarchar(100)	Checked
CorrectionType	int	Checked
AD	int	Checked
[AS]	int	Checked
LMP	datetime	Checked
BMI	float	Checked
PainScale	int	Checked
BodyFat	float	Checked
WaistMeters	float	Checked
HipsMeters	float	Checked
BloodGlucose	float	Checked
Pulse	float	Checked
PI	float	Checked
ActivityMovement	numeric(10,0)	Checked
FEV1	float	Checked
FVC	float	Checked

ALLERGY TABLE

Column Name	Data Type	Allow Null
Oid	Uniqueidentifier	UnChecked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
ReactionType	int	Checked
MedicalHistory	Uniqueidentifier	Checked
Category	Uniqueidentifier	Checked
Type	Uniqueidentifier	Checked
Severity	Uniqueidentifier	Checked
AllergyStatus	int	Checked
ReactionDescription	nvarchar(200)	Checked
Onset	datetime	Checked
DoseSpotID	Int	Checked
Drug	Uniqueidentifier	Checked
ScriptSureID	numeric(10,0)	Checked

MEDICATIONS TABLE

Column Name	Data Type	Allow Null
Oid	Uniqueidentifier	Unchecked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
Category	Uniqueidentifier	Checked
Drug	Uniqueidentifier	Checked
Name	nvarchar(500)	Checked
MedicationStatus	int	Checked
Source	int	Checked
MedicalHistory	Uniqueidentifier	Checked
InfoProvidedToPatient	bit	Checked
Started	datetime	Checked
Stopped	datetime	Checked
PrescriptionStatus	int	Checked
NoteToPharmacy	nvarchar(210)	Checked
RefillsAsNeeded	bit	Checked
RefillQuantity	numeric(5,0)	Checked
GenericsOK	bit	Checked
FormularyChecked	bit	Checked
WrittenDate	datetime	Checked
Pharmacy	Uniqueidentifier	Checked
Quantity	nvarchar(16)	Checked
LastFilled	datetime	Checked

Frequency	Uniqueidentifier	Checked
Dispense	nvarchar(16)	Checked
DispenseUnit	nvarchar(100)	Checked
DaysSupply	numeric(5,0)	Checked
PatientInstructions	nvarchar(400)	Checked
PharmacyNotes	nvarchar(210)	Checked
PrescibedBy	Uniqueidentifier	Checked
DoseSpotID	int	Checked
SureScriptsMessageId	nvarchar(100)	Checked
SubstitutionsOK	bit	Checked
QuantityInt	numeric(10,0)	Checked
[Order]	Uniqueidentifier	Checked
ScriptSureID	numeric(10, 0)	Checked

PROBLEMS TABLE

Column Name	**Data Type**	**Allow Null**
Oid	Uniqueidentifier	Unchecked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
ParentChartItem	Uniqueidentifier	Checked
Type	Uniqueidentifier	Checked
Source	nvarchar(100)	Checked
Category	Uniqueidentifier	Checked
MedicalHistory	Uniqueidentifier	Checked
ProblemStatus	int	Checked

IMMUNIZATIONS TABLE

Column Name	**Data Type**	**Allow Null**
Oid	Uniqueidentifier	Unchecked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
Type	Uniqueidentifier	Checked
Route	int	Checked
Site	int	Checked
RouteOfAdministration	nvarchar(100)	Checked
AdministeredLocation	nvarchar(100)	Checked
Manufacturer	Uniqueidentifier	Checked
StartOfAdministration	datetime	Checked
EndOfAdministration	datetime	Checked
AdministeredAmount	float	Checked

AdministeredUnits	Uniqueidentifier	Checked
LotNumber	nvarchar(100)	Checked
ExpirationDate	datetime	Checked
ReportedToState	bit	Checked
DateReportedToState	datetime	Checked
VaccineDocumentRecipientNam	nvarchar(100)	Checked
VaccineDocumentDateProvide	datetime	Checked
VfcEligibility	int	Checked
AdministeredBy	Uniqueidentifier	Checked
ImmunizationStatus	int	Checked
RefusalReason	int	Checked
ReasonDescription	nvarchar(100)	Checked
DiseaseImminuty	bigint	Checked
Protected	int	Checked

PAST SURGERY TABLE

Column Name	**Data Type**	**Allow Null**
Oid	Uniqueidentifier	Unchecked
PatientReportedNote	nvarchar(1000)	Checked
Date	datetime	Checked
MedicalHistory	Uniqueidentifier	Checked

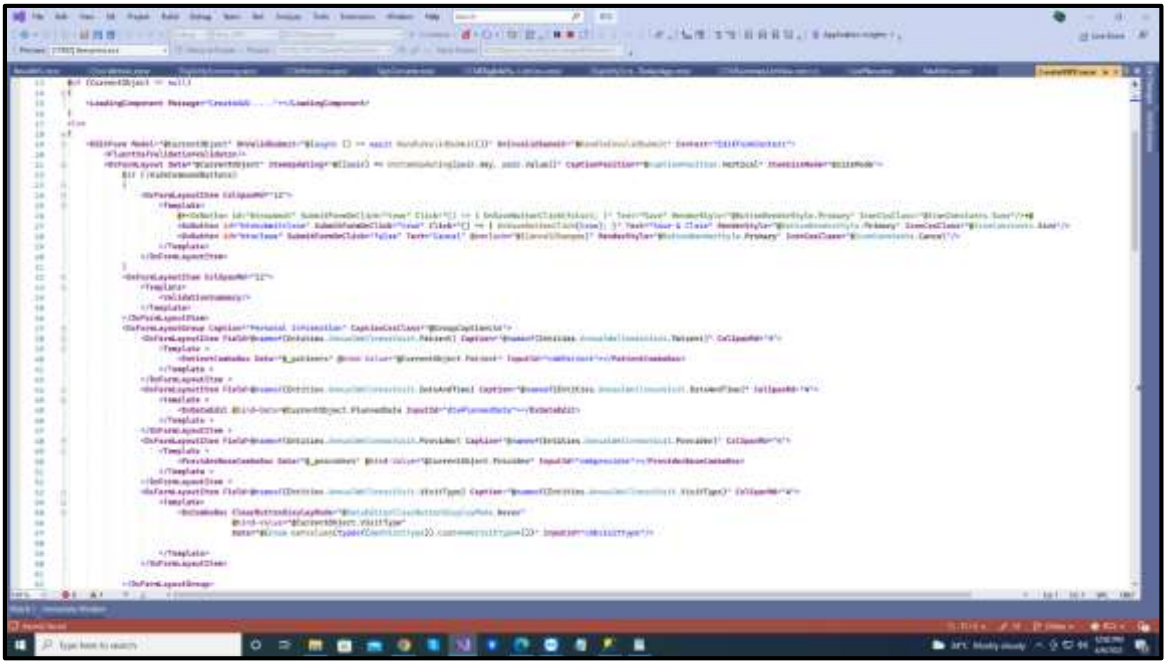
HOSPITALIZATION TABLE

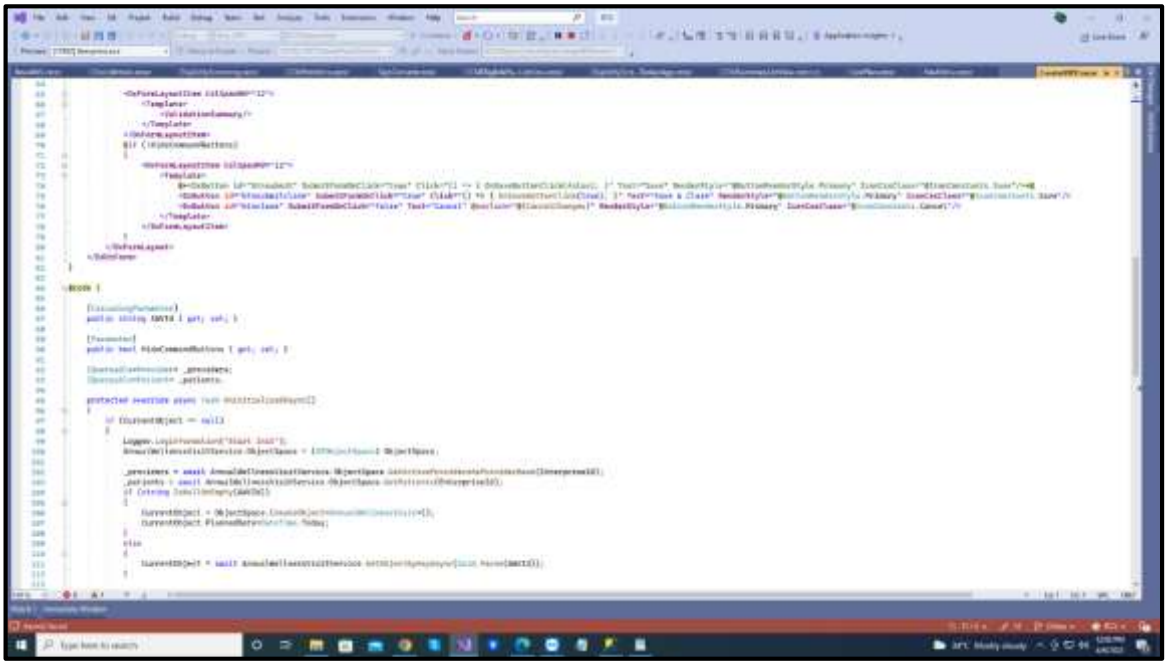
Column Name	**Data Type**	**Allow Null**
Oid	Uniqueidentifier	Unchecked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
ParentChartItem	Uniqueidentifier	Checked
PatientReportedNote	nvarchar(100)	Checked
Date	datetime	Checked
Type	Uniqueidentifier	Checked
Category	Uniqueidentifier	Checked
MedicalHistory	Uniqueidentifier	Checked

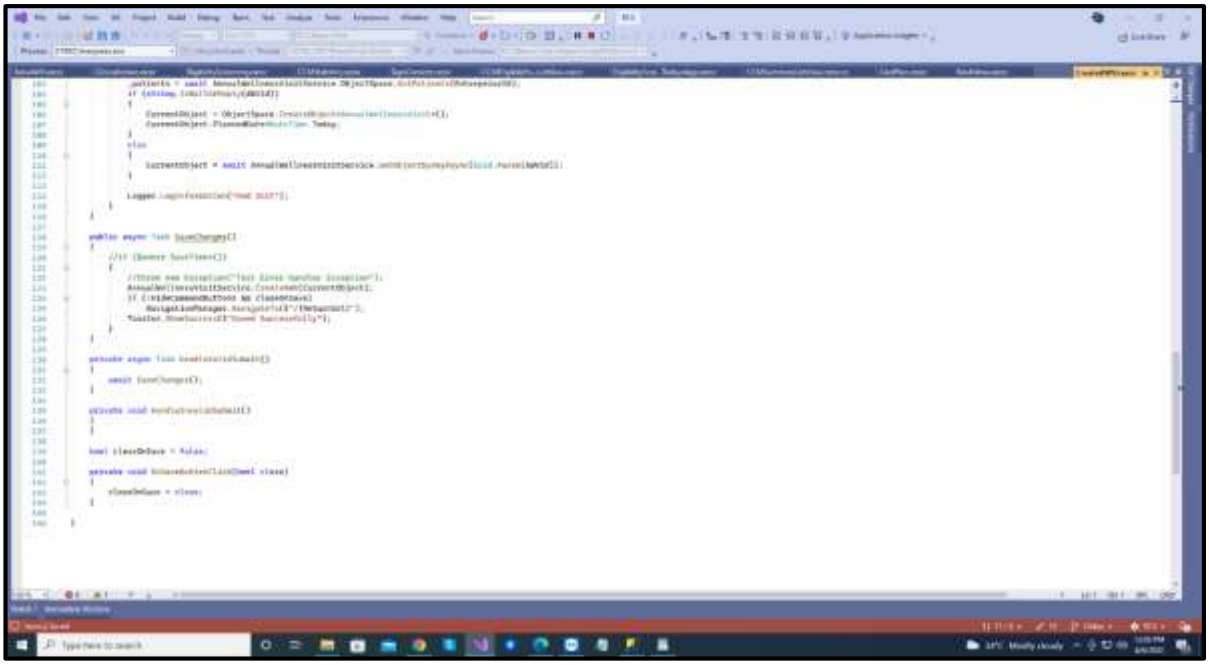
PREVENTIVE SCREENING TABLE

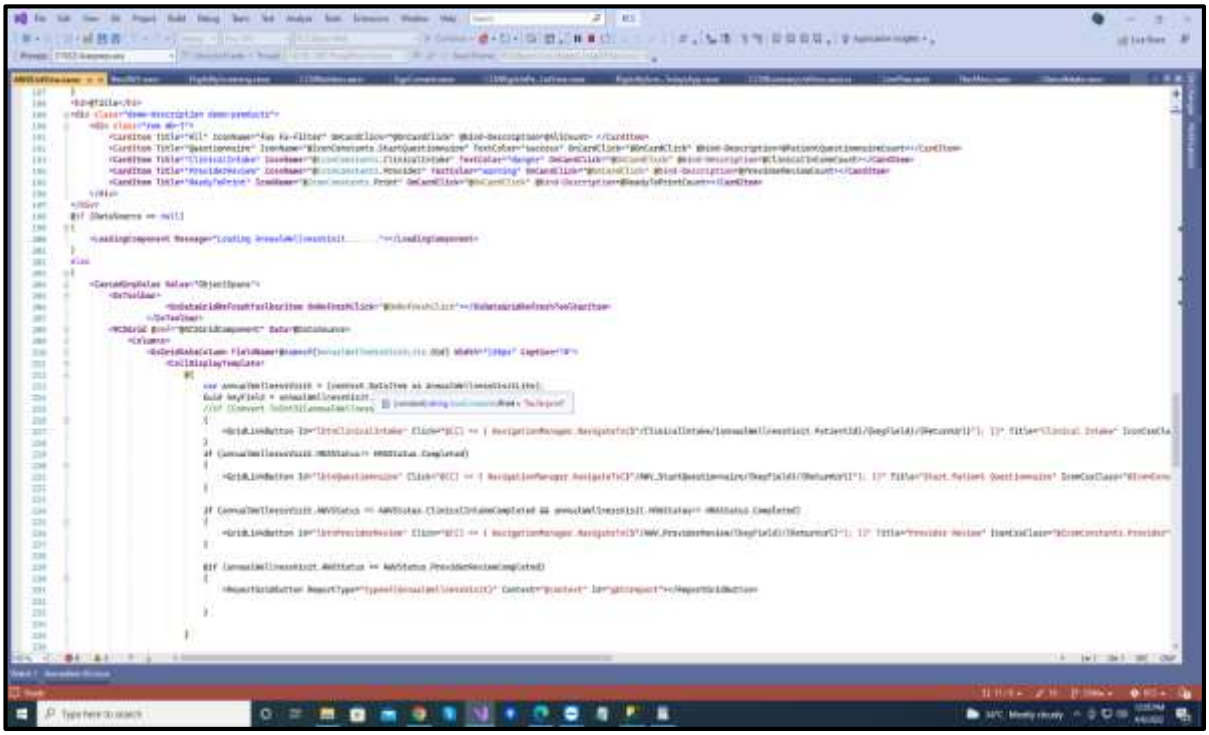
Column Name	Data Type	Allow Null
Oid	Uniqueidentifier	Unchecked
Created	datetime	Checked
CreatedBy	Uniqueidentifier	Checked
LastModified	datetime	Checked
ModifiedBy	Uniqueidentifier	Checked
IsSynchronized	bit	Checked
IsArchived	bit	Checked
PreventiveScreeningType	Uniqueidentifier	Checked
HealthRiskAssessment	Uniqueidentifier	Checked
NeedScreening	bit	Checked
LastCompleted	datetime	Checked
EligibilityFrom	datetime	Checked
Comments	nvarchar(100)	Checked
OptimisticLockField	int	Checked
GCRecord	int	Checked

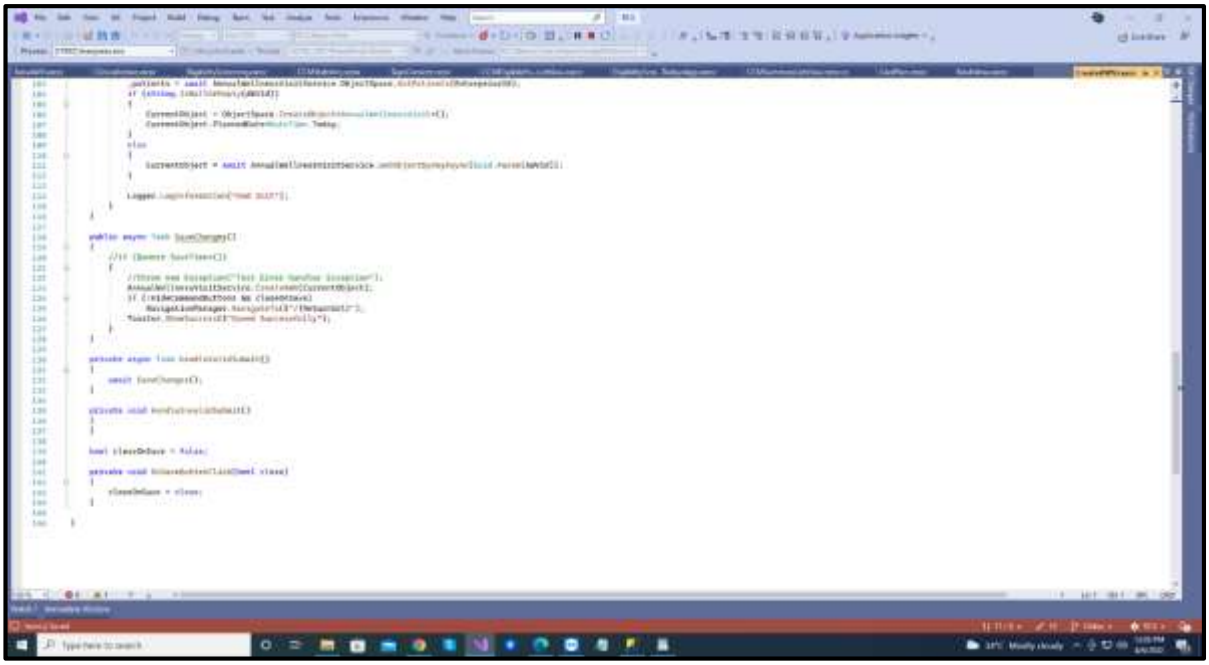
CODE DESIGN



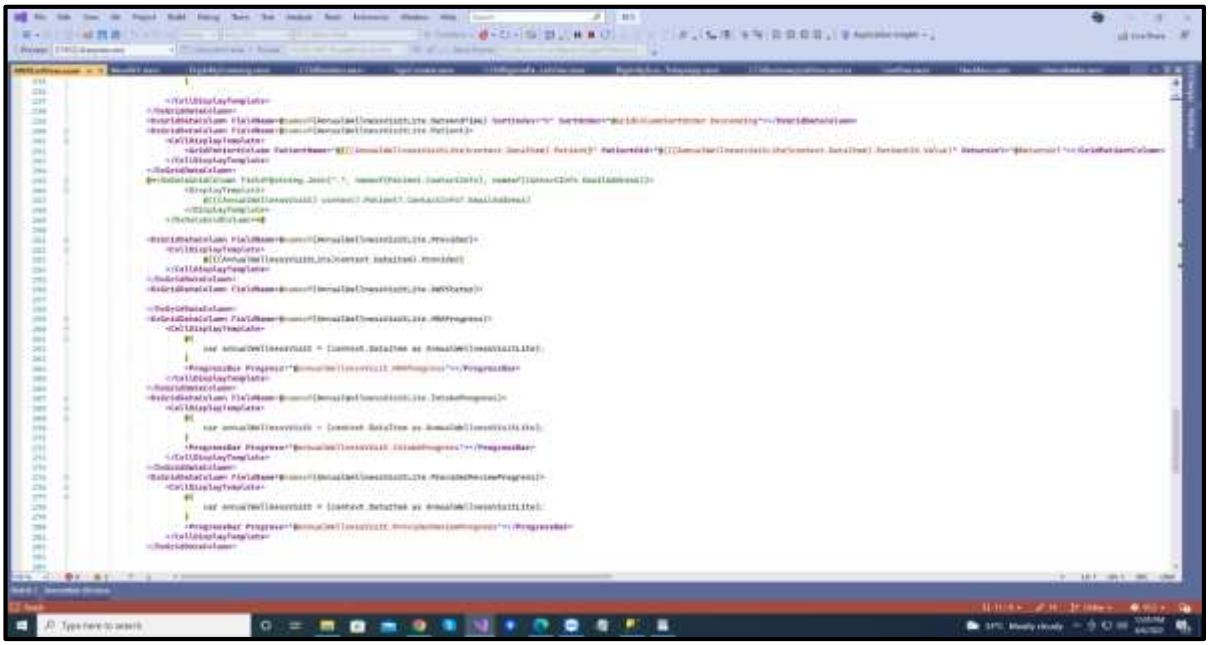


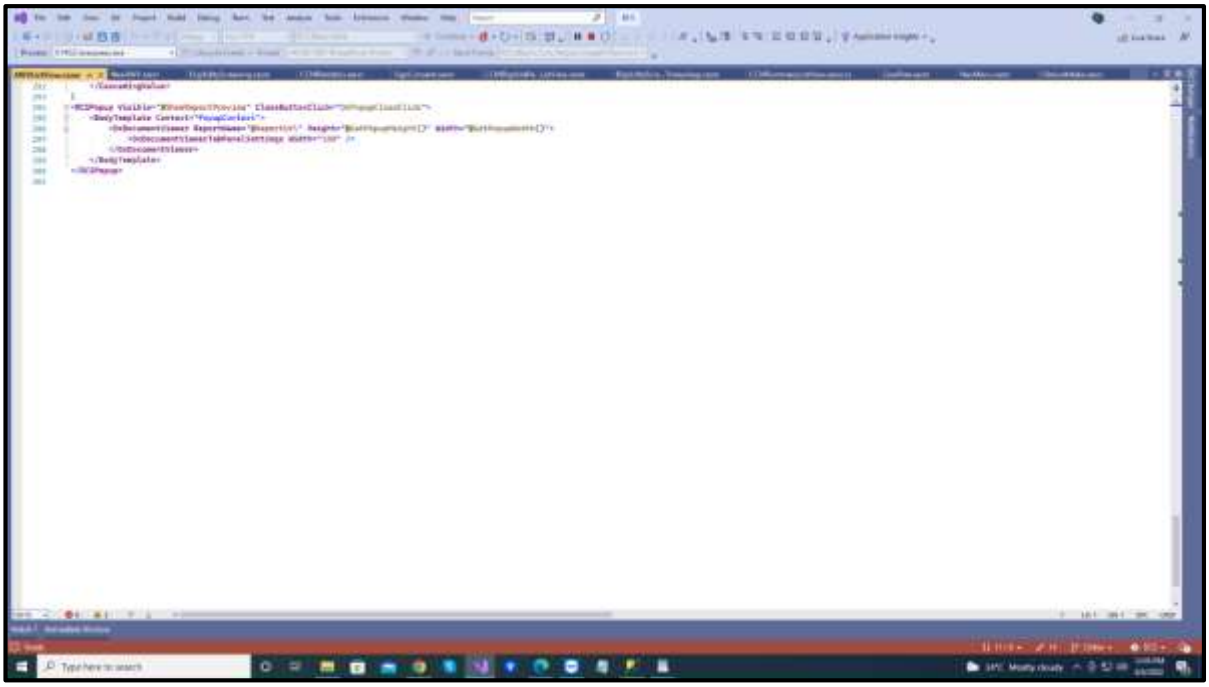


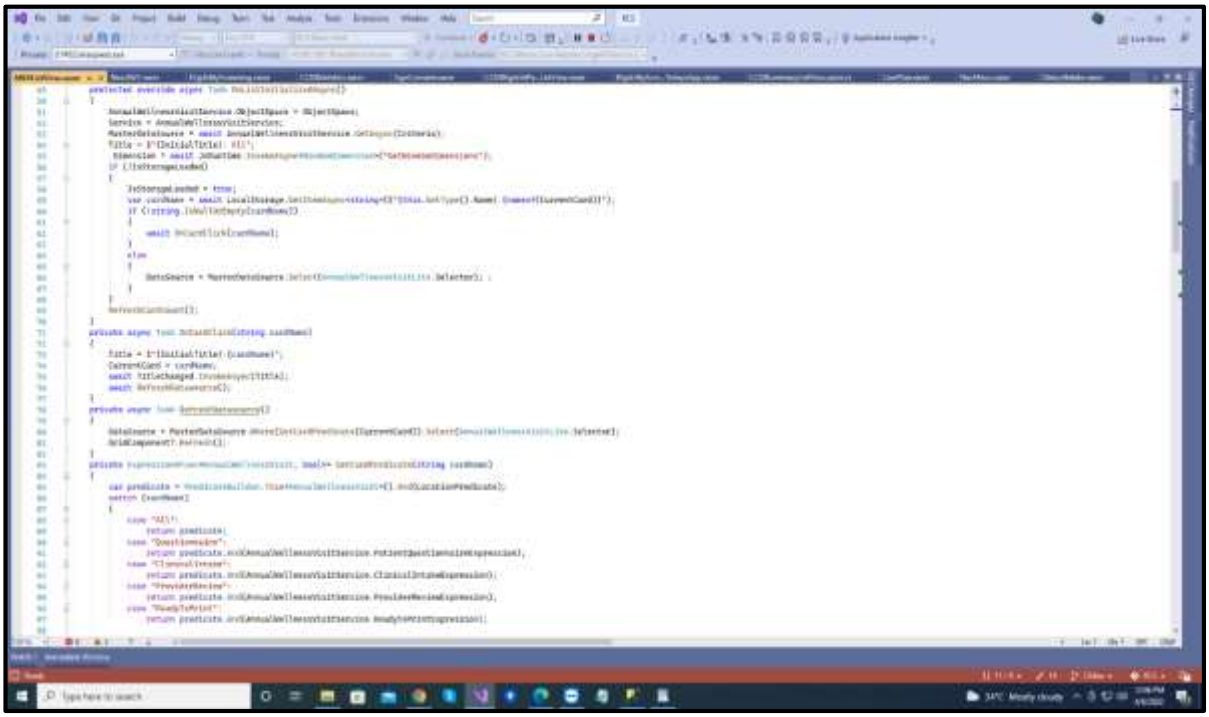


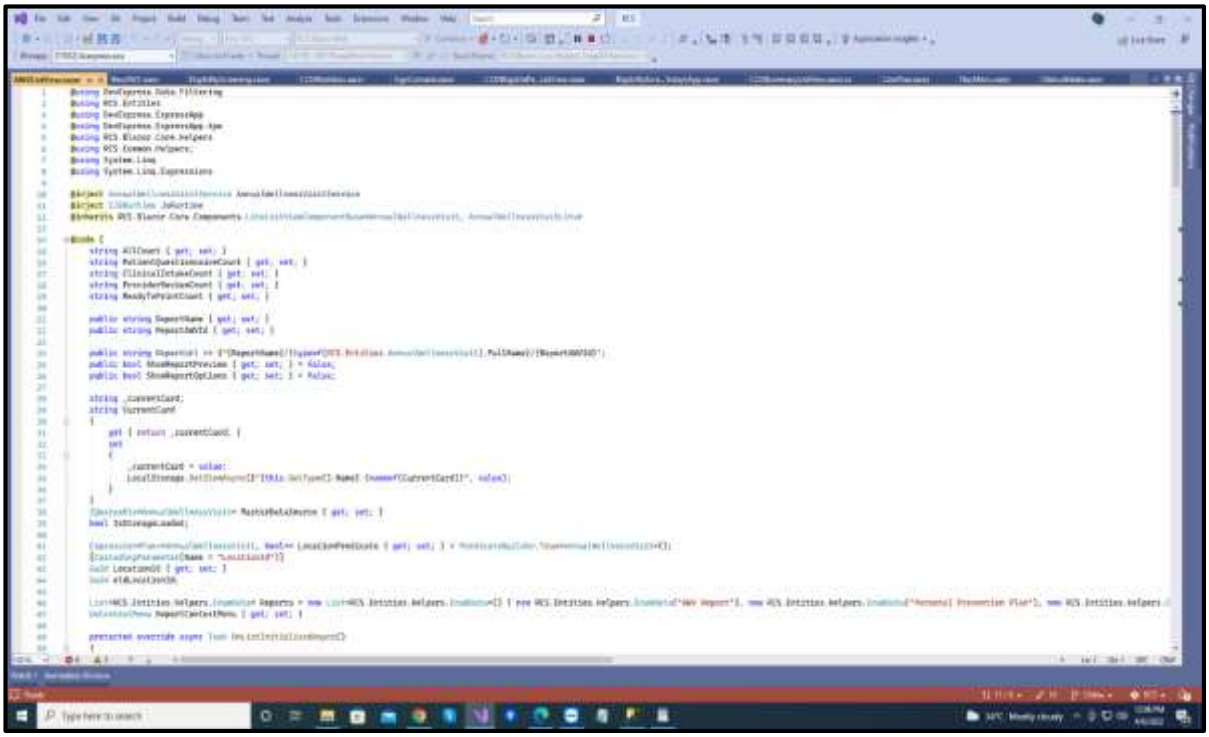


On Clicking AWV List:

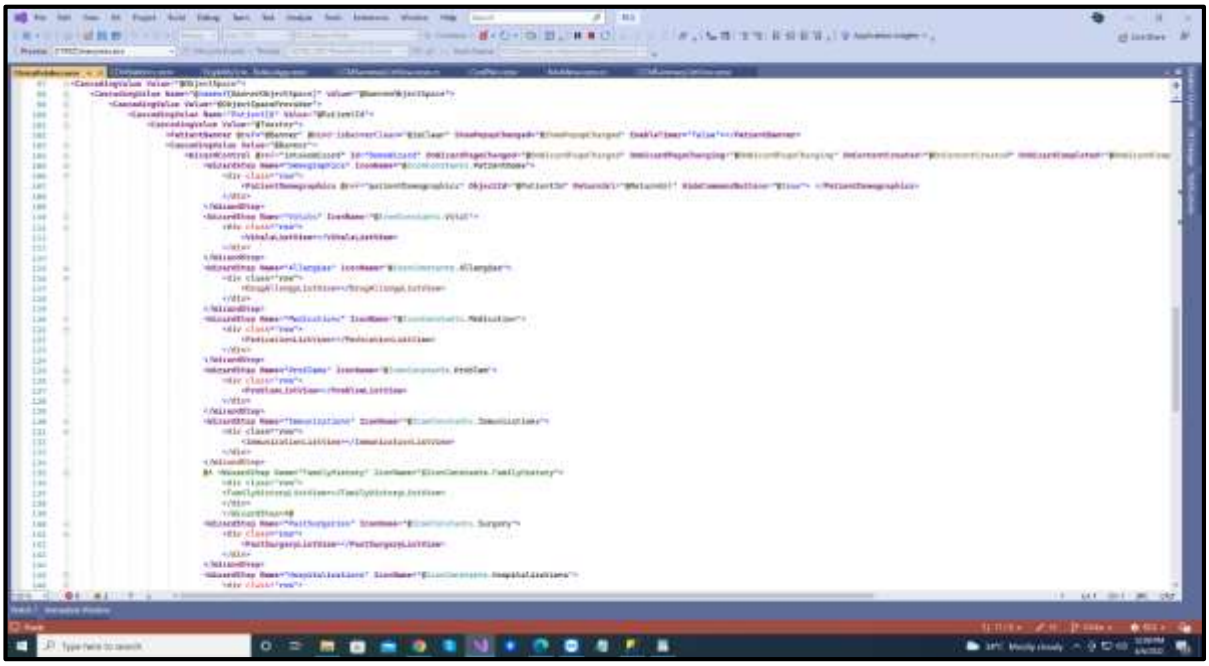


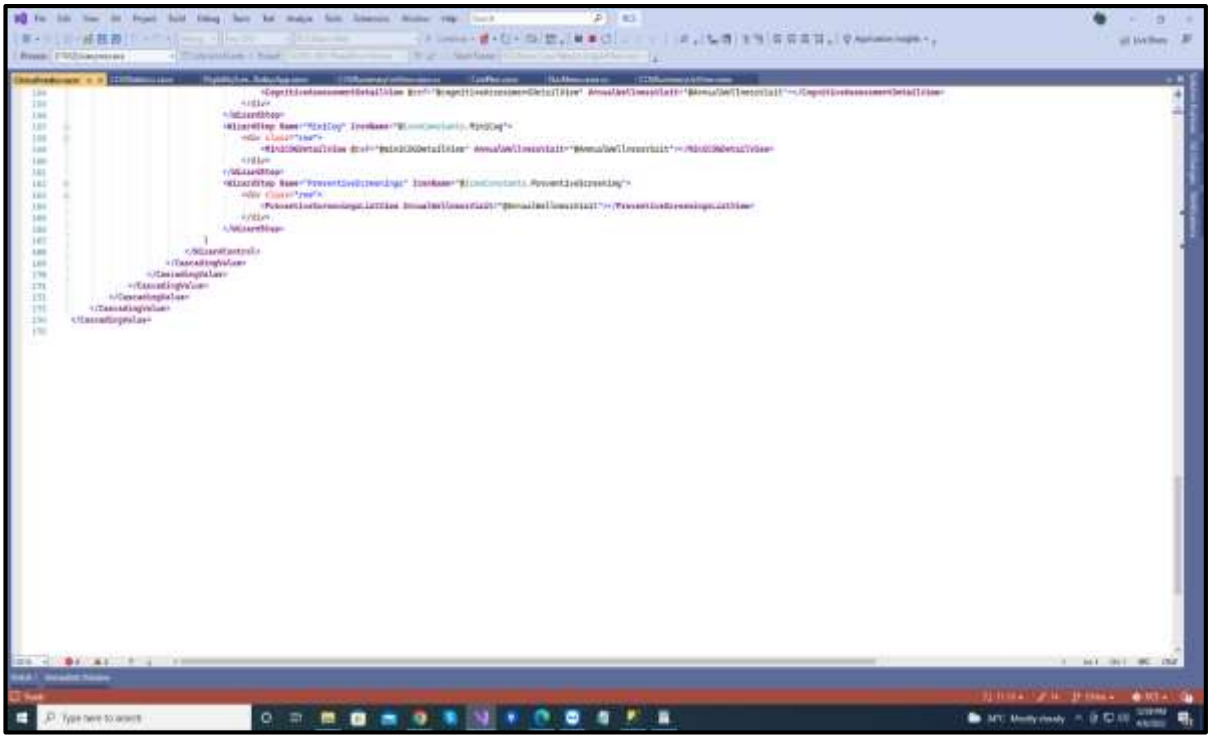


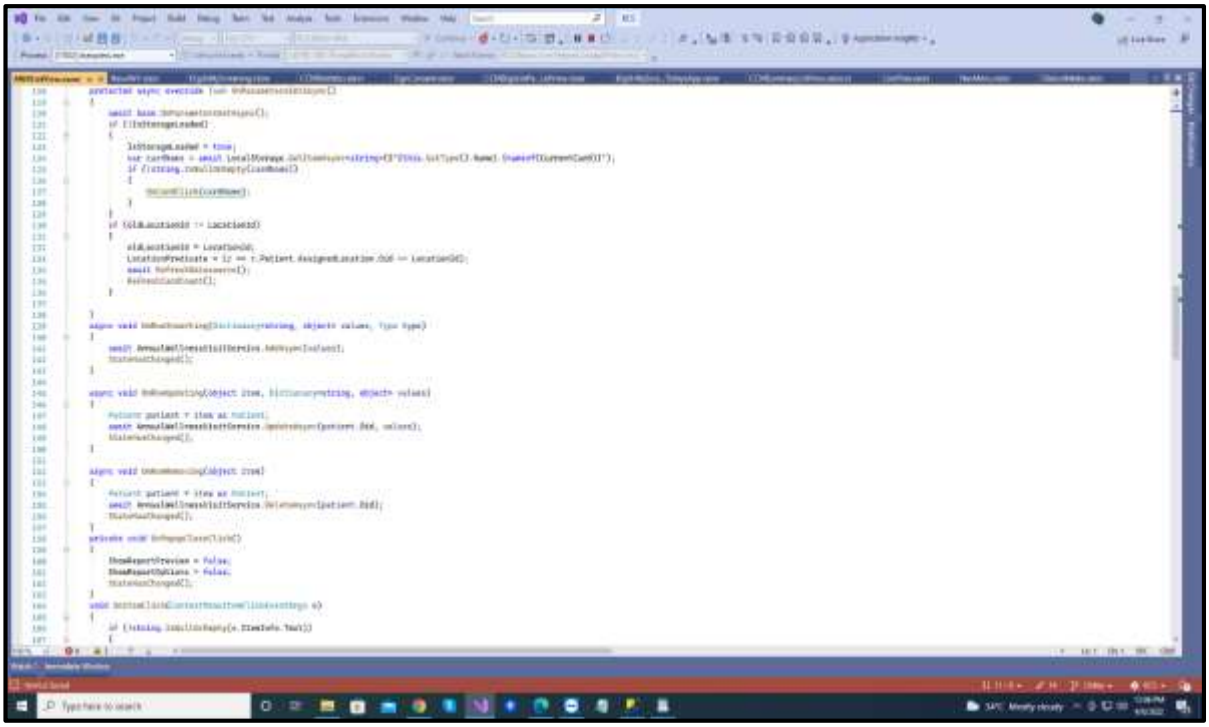




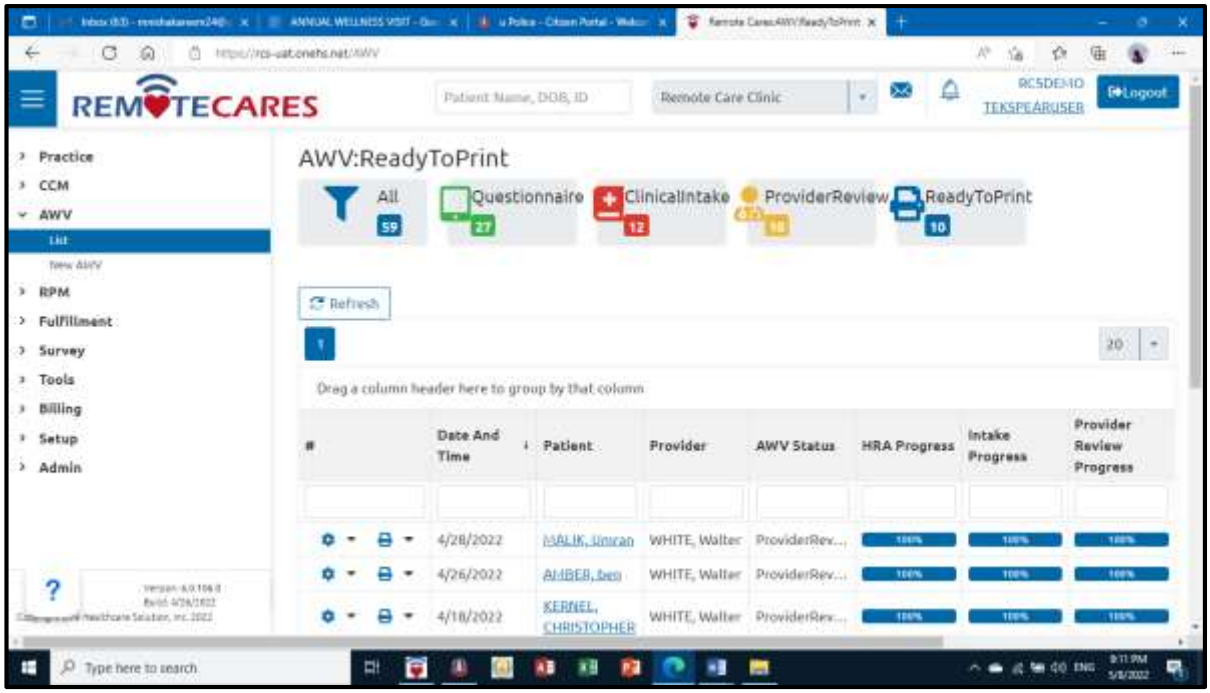
On Clicking Clinical Intake:

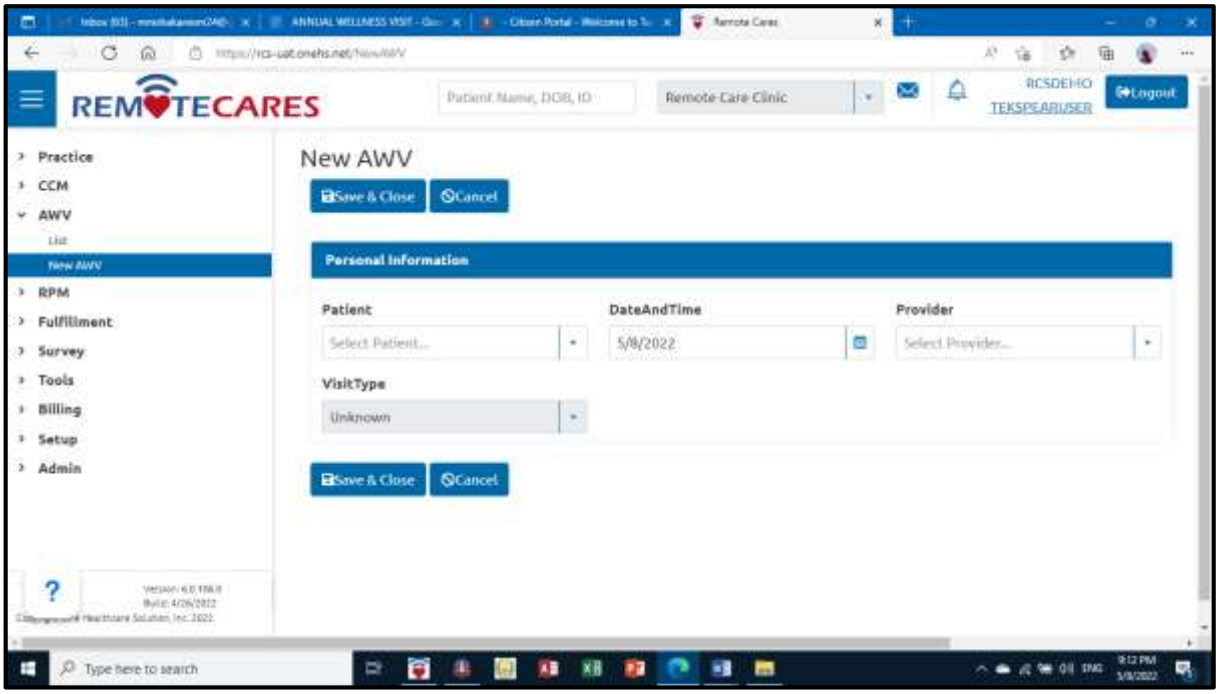


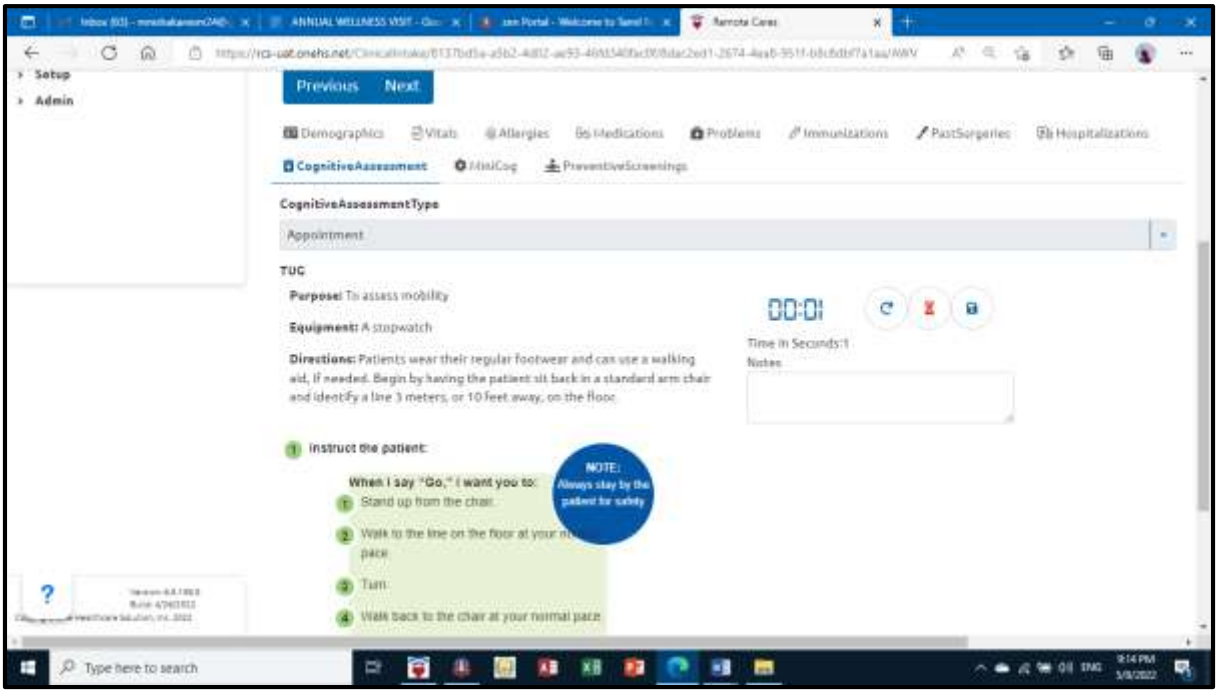


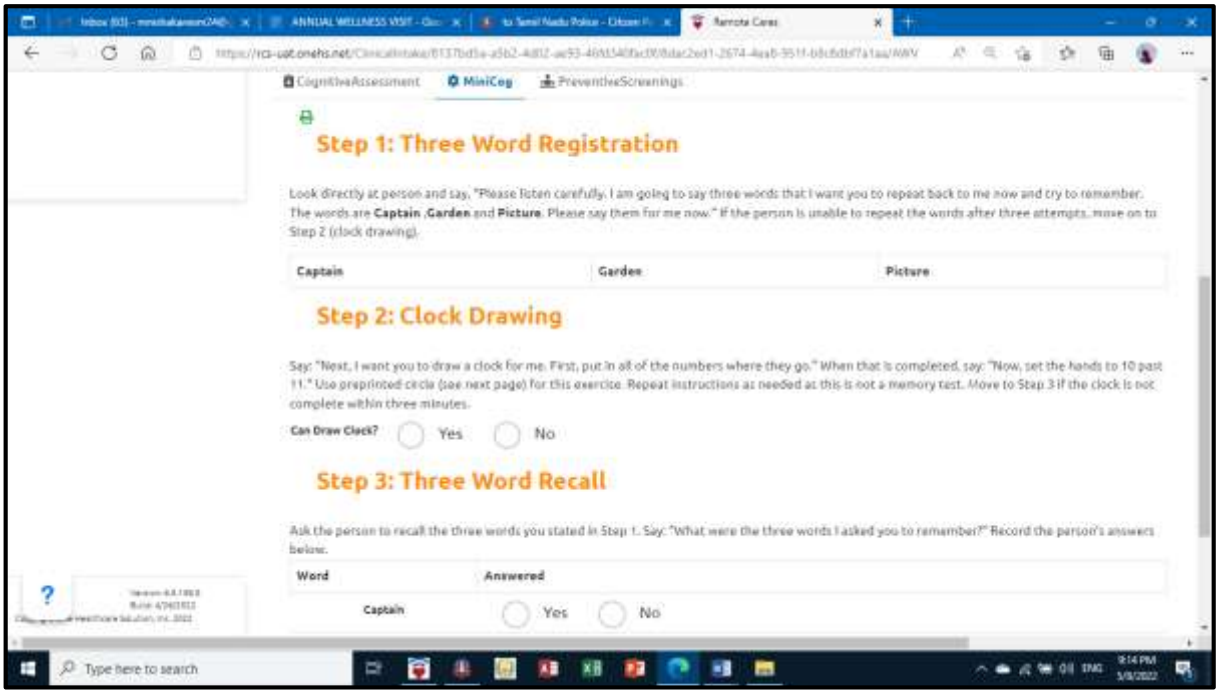


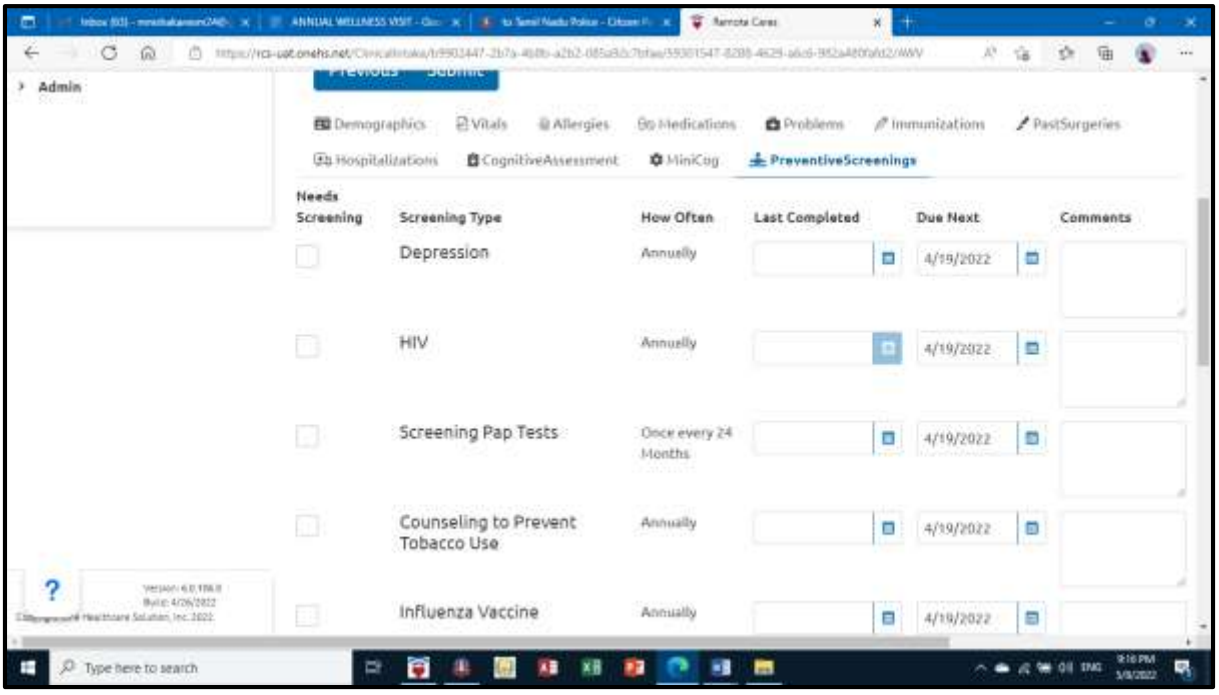
FORM DESIGN

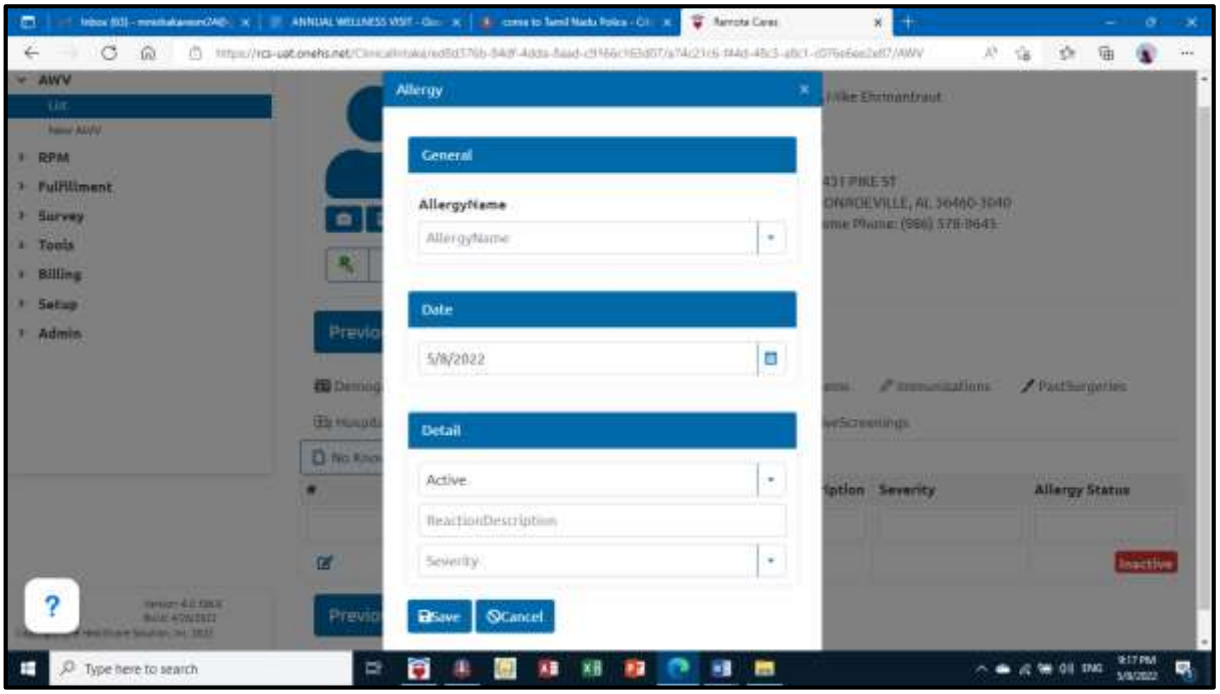

REMOTECARES
Patient Name, DOB, ID
Remote Care Clinic
RCSDEMO
TEKSPEARUSER
Logout
Practice
CCM
AWV
List
New AWV
RPM
Fulfillment
Survey
Tools
Billing
Setup
Admin
AWV:ReadyToPrint
All
59
Questionnaire
27
ClinicalIntake
12
ProviderReview
10
ReadyToPrint
10
Refresh
Drag a column header here to group by that column
#
Date And Time
Patient
Provider
AWV Status
HRA Progress
Intake Progress
Provider Review Progress
4/28/2022
WHITE, Walter
4/26/2022
AMBER, Ben
WHITE, Walter
4/18/2022
KERNEL, CHRISTOPHER
WHITE, Walter
Type here to search

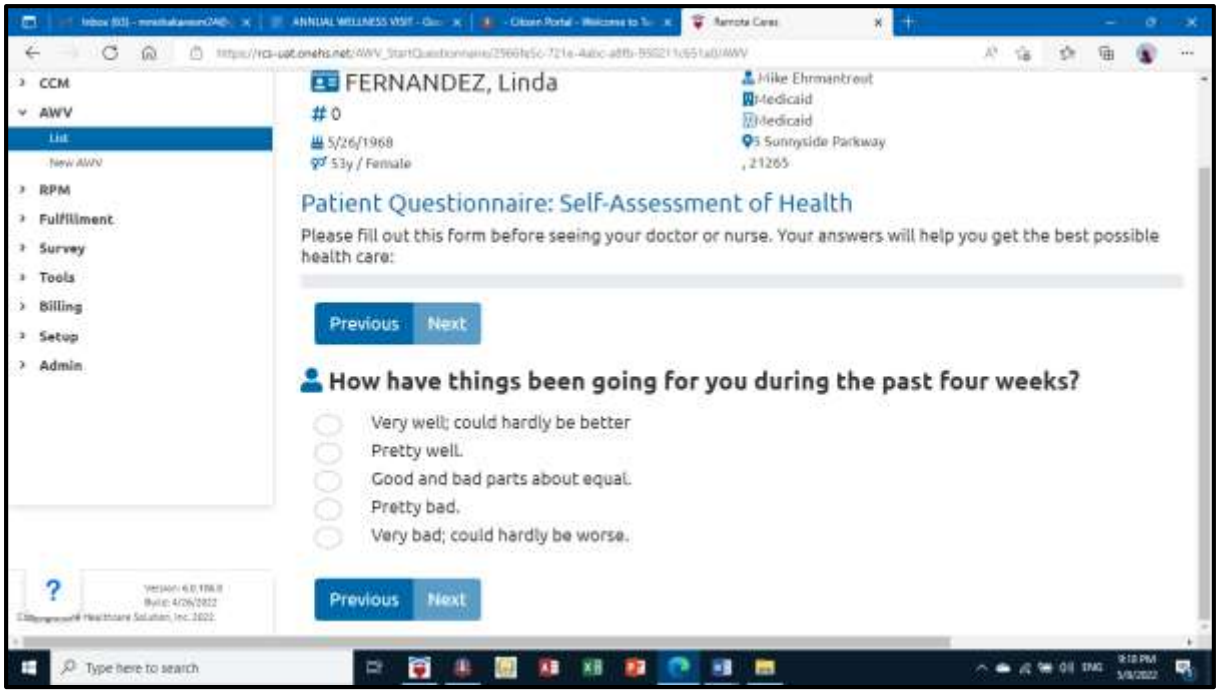

REMOTECARES
Patient Name, DOB, ID
Remote Care Clinic
RCSDEMO
TEKSPEARUSER
Logout
Practice
CCM
AWV
List
New AWV
RPM
Fulfillment
Survey
Tools
Billing
Setup
Admin
New AWV
Save & Close
Cancel
Personal Information
Patient
Select Patient...
DateAndTime
5/8/2022
Provider
Select Provider...
VisitType
Unknown
Save & Close
Cancel
Type here to search

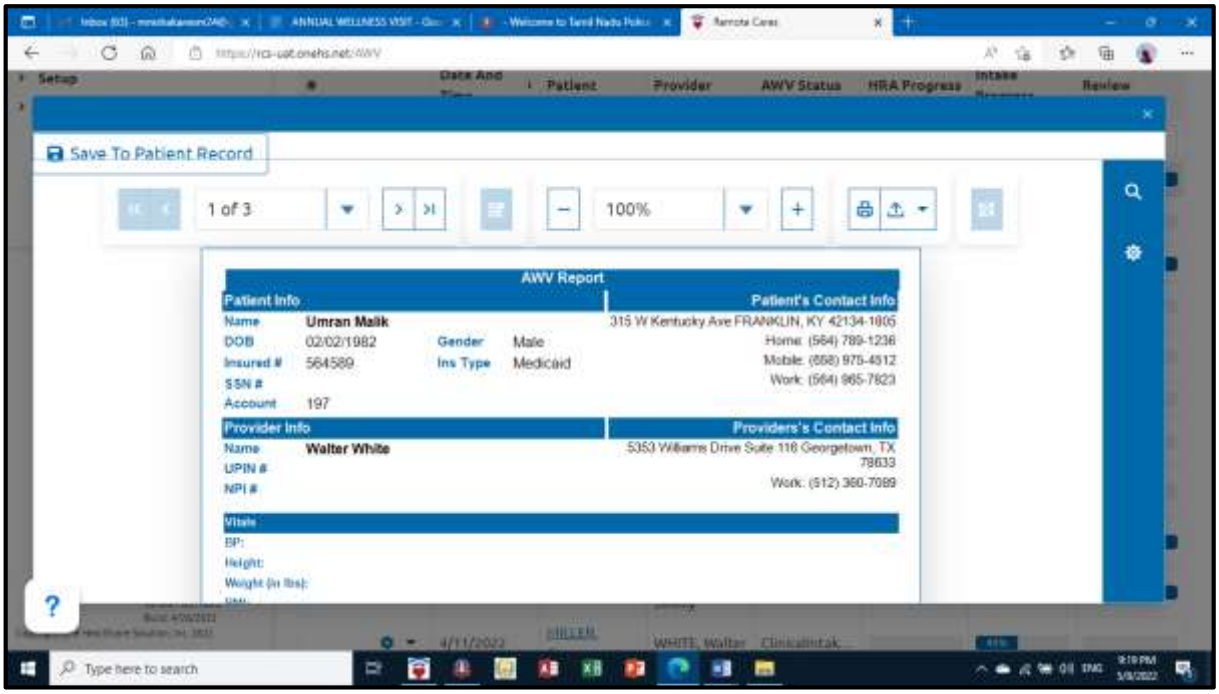

Setup
Admin
Previous
Next
Demographics
Vitals
Allergies
Medications
Problems
Immunizations
PastSurgeries
Hospitalizations
CognitiveAssessment
MiniCog
PreventiveScreenings
CognitiveAssessmentType
Appointment
TUG
Purpose: To assess mobility
Equipment: A stopwatch
Directions: Patients wear their regular footwear and can use a walking aid, if needed. Begin by having the patient sit back in a standard arm chair and identify a line 3 meters, or 10 feet away, on the floor.
00:01
Time in Seconds:1
Notes
1 Instruct the patient:
When I say "Go," I want you to:
NOTE: Always stay by the patient for safety
1 Stand up from the chair.
2 Walk to the line on the floor at your n
pace.
3 Turn.
4 Walk back to the chair at your normal pace.
Type here to search


CognitiveAssessment
MiniCog
PreventiveScreenings
Step 1: Three Word Registration
Look directly at person and say, "Please listen carefully. I am going to say three words that I want you to repeat back to me now and try to remember. The words are Captain ,Garden and Picture. Please say them for me now." If the person is unable to repeat the words after three attempts, move on to Step 2 (clock drawing).
Captain
Garden
Picture
Step 2: Clock Drawing
Say: "Next, I want you to draw a clock for me. First, put in all of the numbers where they go." When that is completed, say: "Now, set the hands to 10 past 11." Use preprinted circle (see next page) for this exercise. Repeat instructions as needed as this is not a memory test. Move to Step 3 if the clock is not complete within three minutes.
Can Draw Clock?
Yes
No
Step 3: Three Word Recall
Ask the person to recall the three words you stated in Step 1. Say: "What were the three words I asked you to remember?" Record the person's answers below.
Word
Answered
Captain
Yes
No
Type here to search


Admin
Demographics
Vitals
Allergies
Medications
Problems
Immunizations
PastSurgeries
Hospitalizations
CognitiveAssessment
MiniCog
PreventiveScreenings
Needs Screening
Screening Type
How Often
Last Completed
Due Next
Comments
Depression
Annually
4/19/2022
HIV
Annually
4/19/2022
Screening Pap Tests
Once every 24 Months
4/19/2022
Counseling to Prevent Tobacco Use
Annually
4/19/2022
Influenza Vaccine
Annually
4/19/2022
Type here to search


AWV
RPM
Fulfillment
Survey
Tools
Billing
Setup
Admin
Allergy
General
AllergyName
Date
5/8/2022
Detail
Active
ReactionDescription
Severity
Save
Cancel
Severity
Allergy Status
Inactive
Type here to search


CCM
AWV
List
New AWV
RPM
Fulfillment
Survey
Tools
Billing
Setup
Admin
FERNANDEZ, Linda
0
5/26/1968
53y / Female
Mike Ehrmantraut
Medicaid
Medicaid
5 Sunnyside Parkway
, 21265
Patient Questionnaire: Self-Assessment of Health
Please fill out this form before seeing your doctor or nurse. Your answers will help you get the best possible health care:
Previous
Next
How have things been going for you during the past four weeks?
Very well; could hardly be better
Pretty well.
Good and bad parts about equal.
Pretty bad.
Very bad; could hardly be worse.
Previous
Next
Type here to search


Save To Patient Record
1 of 3
100%
AWV Report
Patient Info
Name Umran Malik
DOB 02/02/1982
Gender Male
Insured # 564589
Ins Type Medicaid
SSN #
Account 197
Patient's Contact Info
315 W Kentucky Ave FRANKLIN, KY 42134-1805
Home: (564) 789-1236
Mobile: (658) 975-4512
Work: (564) 965-7823
Provider Info
Name Walter White
UPIN #
NPI #
Providers's Contact Info
5353 Williams Drive Suite 116 Georgetown, TX 78633
Work: (512) 360-7089
Vitals
BP:
Height:
Weight (in lbs):
Type here to search

CONCLUSION

Annual Wellness visits are an important for patients and clinicians to discuss prevention strategies and to deliver recommended clinical preventive services, leading to the identification of previously unrecognized diagnoses. This will improve patients' health. Policies and incentives that promote wellness visits are important, and efforts are needed to deliver them to those most in need. Within the primary care setting, there is a deficiency of comprehensive, personalized treatment care plans that identify modifiable risk factors and endorse preventive care. The Medicare Annual Wellness Visit presents an opportunity for patients aged 65 years and older to identify, plan, and optimally manage chronic health conditions and increase preventative care. The health risk assessment, which is part of the Annual Wellness Visit, is intended to identify health behaviours and risk factors that can be discussed with the patient and utilized to collaboratively create a personalized prevention plan that aims to reduce risk factors and related diseases. The percentage of Annual Wellness Visits completed or not completed (among eligible patients) during the pre- intervention and post- intervention was determined by dividing the total number of eligible patients who completed their annual wellness visits by the total number of eligible patients. At the conclusion of the project, there was a 23.7%, or five- fold- increase in the Annual Wellness Visits completed, which is statistically significant. Post- intervention chart audits revealed health risk assessments in 100% of the charts when an Annual Wellness Visit was completed.

Thus, Annual wellness visits can be integrated successfully in a busy outpatient primary care practice within the time allocated for office visits. Completion of annual wellness visits increased significantly over the project two month implementation timeframe. A tracking tool revealed a higher capture rate when annual wellness visits were scheduled with pre- arranged office visits. Patient and provider participation in the process increased referrals for preventative screenings and vaccinations. The annual wellness visit also has the opportunity to increase practice revenue gained from Medicare reimbursement and increased relative value units.

FUTURE ENHANCEMENT

Annual Wellness Visit project has a very vast scope in future. Following are the future scope for the project,

- Eligible Patients can be identified by integrating API with Medicaid
- Opioid Questionnaire implementation
- The Questionnaire can be done be sending an email to the patient.
- Clinical Review can be done via an integrated tele-calling system.
- Ability for the provider to review multiple AWV and sign then at once.

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APARTMENT VISITOR MANAGEMENT APP

A project Submitted to

ST. MARY'S COLLEGE (AUTONOMOUS), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI in partial fullfilment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted By

KIRTHIGA. B

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St. Mary's College (Autonomous), Thoothukudi- 628001

MAY 2022

CERTIFICATE

This is to certify that this project work entitled as "**APARTMENT VISITOR MANAGEMENT APP**" is submitted to St. Mary's College (Autonomous), Thooothukudi affiliated to **Manonmaniam Sundaranar University**, **Tirunelveli,** in partial fulfillment for the award of the degree of Master of Science in Computer Science for the work done during the year 2021-2022 by **KIRTHIGA. B (Reg.No.:20SPCS09).**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do hereby declare that the project entitled "**APARTMENT VISITOR MANAGEMENT APP**" submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of Ms.C.NAYANTHRA MASCARENHAS M.Sc., M.Phil., SET(Coordinator). Assistant Professor, PG Department of Computer Science (SSC), St. Mary's College (Autonomous), Thoothukudi.

Station: Thoothukudi **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to **Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani, Director of SSC,** St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I express my hearty thanks to my guide to **Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET.,** Assistant Professor and SSC Coordinator, PG Department of Computer Science (SSC), for her valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to **Ms. A. Jenitta Jebamalar M.Sc.(IT), M.Sc.(CS), M.Phil., B.Ed.,** Assistant Professor, PG Department of Computer Science (SSC) and **Dr. A. Vithya Vijiayalakshmi., MCA., M.phil., Ph.D.,** Assistant Professor, PG Department of Computer Science (SSC) for her encouragement and support.

I am much indebted to **Mr. Arunachalam M.Sc.(CS),Proprietor, Acme Infotek** for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

ABSTRACT

Visitor management system is usually used in places where a large number of visitors come and go. Whether we are running an apartment, or a huge corporate company or a small office, we will have to deal with visitors on a daily basis. For the sake of safety, we should keep track of all those who visit your premises. Visitor management system records the visitant details in the database to maintain records of all the people who visited the building. By stacking information, a Visitor Management System can record the usage of the facilities by specific visitors and offer documentation of visitors. Modern visitor management system enables the operator to know the total visitors inside the premises replacing with the old technique of manually entering all the visitor's details by automating the entire process. On the time of registration, the Visitors are provided access which indicates area to which the Visitors should access. System also has inbuilt facility to indicate or investigate previous visits made by the visitor which increases authentication of visitors. Manual systems are boring because of its time consumption but in this visitor management software it records all-relevant information about the visitor and stores it automatically. In this project, a QR based visitor management system can be developed and store visitors record in centralized server. The project contains two users namely tenants and watchman. The tenants can generate a QR code and share it to visitors through WhatsApp, email or any other related source. The visitors can show the QR code to security of the apartment and the security can be scanned the QR code through Scanning App. The app will read the full details and check the with the local database and allow the security person to update the record as permitted or denied. This system is implemented in Android and databased will be recorded in MySQL server.

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INTRODUCTION

The System supports a Visitor Management System (VMS) to allow the user to track visitors. The system shall reduce visitor queues by automatically processing multiple visitors simultaneously at one station. The system shall support printing of custom designed visitor passes with expiration date, visit area, host being visited, and visit purpose. In addition, track which Tenants have regular personal Visitor, secure Visitor Log.

Visitor management system, typically refer as a structure to get visitors details.

Generally, there are many organisations or apartments are still using the conventional paper log or guest book to record the access of the visitors. This manual method consumes longer time when the number of visitors is exceeded the limit. Meanwhile, an increasing number of visitors indicates that the security issues should be concern in the organisation or apartments. This is mainly because the operators are lack of time to verify the identification of each visitor when they are tons of guest entering the building. Moreover, paper log is inadequate to offer greater traceability in which cannot be archived or efficiently retrieved after several years.

Due to above circumstances, VMS contribute a good solution to solve the problems exist in the conventional method. An integrated VMS with the Malaysian Identification Card, MyKad as the credential to enter the building is an easy way to identify and record the visitor's personal information. This authentication system also helps the security officer to determine whether the visitors are giving the right to enter the building

Apartment management system is a computer-based system which is used to monitor the various activities of a regular residential metropolitan society. The concept of apartment management system has arisen from the fact that various large societies need monitoring and maintenance for their various day to day activities.

Apartment management is the operation, control, and oversight of real estate as used in its most broad terms. In proposed system, the details of the individual records are entered separately.

SYSTEM SPECIFICATION

HARDWARE SPECIFICATION

COMPONENT	SPECIFICATION
CPU	Intel Dual Core 2.4 GHz or Later
RAM	2GB DDR2
Hard Disk	160 GB
Display	Wide VGA (Video Graphics Array)
Input	Keyboard and Mouse
Optional Devices	Android Phone (Jelly Bean 4.2 or higher)

SOFTWARE SPECIFICATION

COMPONENT	SPECIFICATION
Front End	Android
Back End	MySQL
IDE	Android Studio
Language	Java
Platform	Windows 7 or later
Database Server	XAMPP

PROJECT DESCRIPTION

SCOPE OF THE PROJECT

QR Code approach helps to overcome these obstacles in developing a system for generating a QR Code, in the gate pass generation in offices for visitors. In this proposed system, we propose a new software tool for QR Code generation and pass generation for apartments. This application is fully applied with the visitor's pass. Once the person wants the out pass then at the exit point the phone number is be taken as input and again a new QR Code will be assigned to the visitor. The main aim of this system is to provide gate pass security to the apartment.

The authorized person will be allowed by the system to leave from the campus and if the person is found to be authorized then it proceeds for the generation of gate pass with effective rule matching. This system is divided in two parts, the QR Code generation system and the generation of the gate pass for the authorized person.

AIM OF THE PROJECT

- Reduce and enhance the security of the gatekeeper work with lesser paper works.
- Improve the process with touch less method.
- Very easy to implement in a apartment with more than 25 flats.

MODULE DESCRIPTION

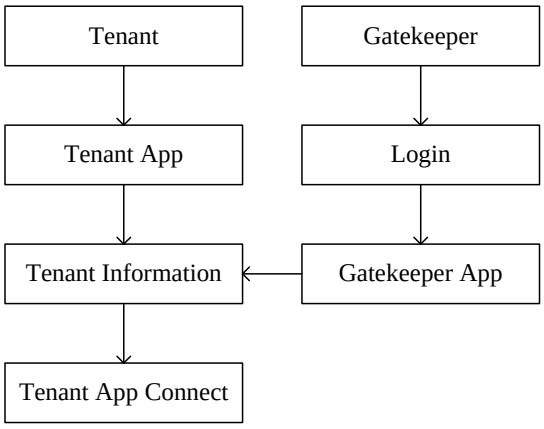
- Login Module
- Tenant Information Module
- QR Code Module
- Visitor Log Module

LOGIN MODULE

The system contains two users:

1. Tenant
2. Gatekeeper

- The Gatekeeper have a separate application for maintaining and managing Tenants and Visitors information.
- The Tenants can login using the mobile number which has been registered from the Gatekeeper application by the gatekeeper.



TENANT INFORMATION

- The Gatekeeper adds the Tenant information such as Tenant Name, Flat No, Floor along with Mobile Number.
- After login with the mobile number, the tenants can view their profile.
- The application uses one time login.

QR CODE MODULE

- The tenants can add the visitor's information in their tenant application.
- This information will later convert into QR code, and the information will be encoded in the JSON format.
- So that, the Gatekeeper application is the only app to read and parse the information in the QR Code Scan Activity

VISITOR LOG MODULE

- In this visitor log module, the gatekeeper verifies or search the visitor's information using their mobile numbers or visitor name.
- The activity also displays the action of the visitors visit – accepted or rejected.
- The log information is stored in the centralized server. As the data is electronic, this helps the system by record maintenance.

SYSTEM STUDY

EXISTING SYSTEM

The current system is a manual based which is not computerized especially for visitors inbound process. The system takes lots of time for performing different activities and difficult to maintain the visitors' inbound records.

DISADVANTAGES OF EXISTING SYSTEM

- Existing system is completely hardcopy.
- Time consuming procedure.
- Tracking of the visitor details is difficult.

PROPOSED SYSTEM

The objectives for creating this system are to reduce the paperwork and to maintain the document in electronic form. Accurate maintenance of accurate and consistent records on gate usage. To remove the duplicity of the pass and allow the verified visitor to cross the premises. In the earlier system, there were a lot of duplicities done by the gatekeeper which are going to be removed by using this system.

ADVANTAGES OF PROPOSED SYSTEM

- The system is touchless and paper less
- Less time consumption.
- Tracking of the visitor details is easy and simple.

SYSTEM ANALYSIS

FEASIBILITY STUDY

All project is feasible when given unlimited resources and infinite time.it is both necessary and prudent to evaluate the feasibility of a project at the earliest possible time. A feasibility study is not warranted for system in which economic justification is obvious, technical risk is low, few legal problems are expected and no reasonable alternative exits.an estimate is made of whether the identified user needs may be satisfied using current software and hardware technologies.

TECHNICAL FEASIBILITY

This is related to the technical of the project feasibility if check the cost to conduct a full system investigation, cost of hardware and software. The apartment management system supports the economic feasibility to a great extends, development of the system and the cost of hardware and software are not high.

ECONOMIC FEASIBILITY

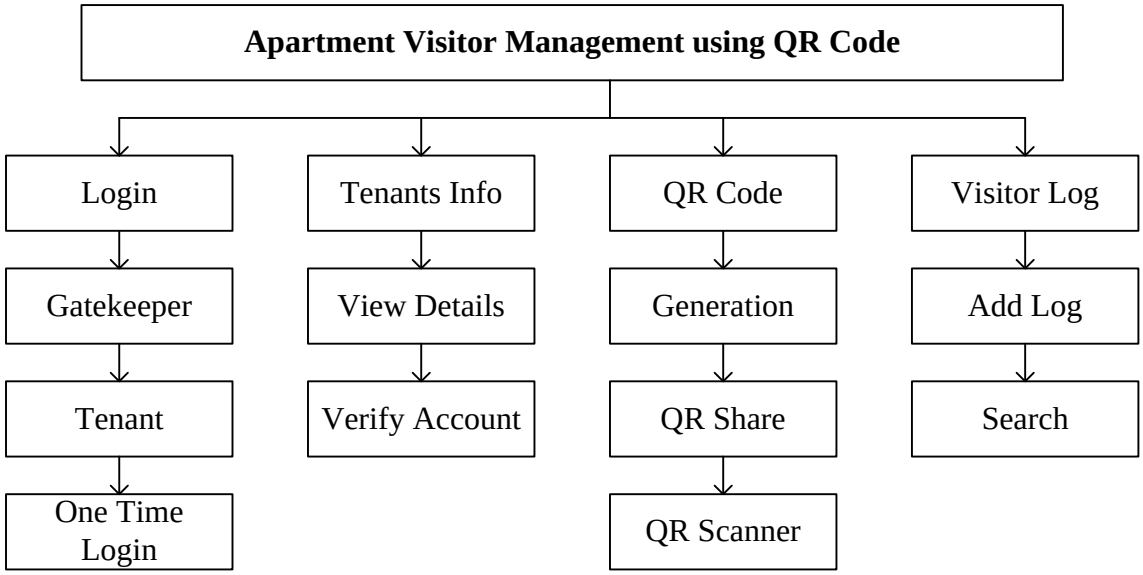
A system that can be develop d technically and that well be used, if installed, must be still good. Always the financial benefits must be equal or exceed the cost. Economic analysis is the most frequently used method for evaluating the effectiveness of a candidate system or more commonly known as cost or benefits analysis.

OPERATIONAL FEASIBILITY

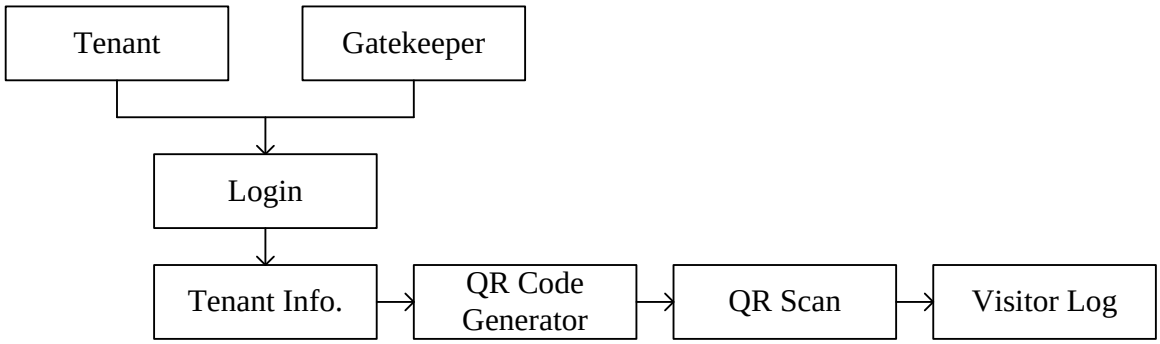
Proposed system is beneficial only if they can be turned into information systems. That is, it will meet the organization operating requirements and also check that whether the system will work when it is developed and installed. Therefore, it is understandable that the introduction of a candidate system requires special efforts to educate, sell and train others.

SYSTEM DESIGN

ARCHITECTURE DIAGRAM



FLOW DIAGRAM



SYSTEM TESTING

SYSTEM TESTING

Before applying method to design effective test cases, a software engineer must understand the basic principles that guide software testing. Davis (DAV95) suggests a set of testing principles which have been adapted for use in this book.

- All tests should be traceable to customer requirements.
- Test should be planned long before testing begins.
- Test pare to principle applets to software testing.
- Testing should begin “in the small” and progress towards testing “in the page”
- Exhaustive testing is not possible.

UNIT TESTING

Unit testing focuses on verification errors on the smallest unit of software design-the module. Using the procedural design description as a guide, important control paths are tested to uncover errors within the boundary of the module.

The module interface is tested to ensure that the information properly flows into and out of the program unit under test. Boundary conditions are tested to ensure that the module operates properly at the boundaries established to limit of restrict processing.

INTEGRATION TESTING

Integration testing is a systematic technique for constructing the program structure while conducting test to uncover errors associated with interfacing. The objective is to take unit tested modules and build a program structure that has been dictated by design.

WHITE BOX TESTING

White box testing is some time is called glass box testing, is a test case design that uses a control structure of the procedural design to drive the test cases. Using white-box testing methods, the software engineer can drive test cases that

- Guarantee that logical decisions are on the true and false sides
- Exercise all logical decisions are on the true and false sides
- Execute all loops at their boundaries and within their operational bounds
- Exercise internal data structure to assure the validity

ACCEPTANCE TESTING

Finally, when the software is completely built, a series of acceptance tests are conducted to enable the client to validate all requirements. The user conducts these tests rather than the system developer, which can range from informal test drive to a planned and systematically executed series of tests. These acceptance tests are conducted over a period of weeks or months, there by uncovering cumulative errors that might degrade the system order time. In this process alpha testing and beta testing are used to uncover the errors that only the end user seems able to find.

ALPHA TESTING

The customer conducts the alpha test at the developer's site. The client notes the errors and usage problems and gives report to the developer. Alpha tests are conducted in a control environment.

BETA TESTING

The beta testing is conducted at one or more customer's sites by the end users of the software. Unlike the alpha testing, the developer is not present. Therefore, a beta test is a "live" application of the software in the environment that cannot be developed by the developer. The customer records all the problems encountered during the beta testing and reports these to the developers at regular intervals.

BLACK BOX TESTING

Black box testing focuses on the functional requirements of the software. That is black box testing enables the software engineer to drive a set of input conditions that will fully exercise the requirements for a program. Black box testing is not an alternative for white box testing techniques. Rather, it is a complementary approach that is likely to uncover different class of errors.

Black box testing attempts to find errors in the following categories:

- Interface errors.
- Performances in data structures or external database access.
- Performance errors.
- Initialization and termination errors.
- Incorrect or missing functions.

All the above-mentioned errors were checked in the process of black.

CODING

WATCHMAN APP

LOGIN PAGE

```
package com.example.watchmanapp;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
public class MainActivity extends AppCompatActivity {
private EditText etUsername, etPassword;
private Button btnLogin;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
//getSupportActionBar().hide();
etUsername = (EditText) findViewById(R.id.etUsername);
etPassword = (EditText) findViewById(R.id.etPassword);
btnLogin = (Button) findViewById(R.id.btnLogin);
btnLogin.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
String Username = etUsername.getText().toString();
String Password = etPassword.getText().toString();
```

```
if (Username.equals("admin") && Password.equals("admin")) {
Intent intent = new Intent(MainActivity.this, HomeActivity.class);
startActivity(intent);
finish();
}
}
});
}
```

ADD FLAT ACTIVITY

```
package com.example.watchmanapp;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Context;
import android.content.res.Resources;
import android.os.AsyncTask;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import java.io.BufferedReader;
import java.io.InputStream;
import java.io.InputStreamReader;
import java.net.HttpURLConnection;
import java.net.URL;
public class AddFlatActivity extends AppCompatActivity {
EditText etFlatNo, etBlock, etFloor, etTenantName, etMobileNumber, etTotalOccupants;
```

```
Button btnFlat;
DBHelper dbHelper;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_add_flat);
dbHelper = new DBHelper(this);
etFlatNo = (EditText) findViewById(R.id.etFlatNo);
etBlock = (EditText) findViewById(R.id.etBlock);
etFloor = (EditText) findViewById(R.id.etFloor);
etTenantName = (EditText) findViewById(R.id.etTenantName);
etMobileNumber = (EditText) findViewById(R.id.etMobileNumber);
etTotalOccupants = (EditText) findViewById(R.id.etTotalOccupants);
btnFlat = (Button) findViewById(R.id.btnAddFlat);
btnFlat.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
String FlatNo = etFlatNo.getText().toString();
String Block = etBlock.getText().toString();
String Floor = etFloor.getText().toString();
String TenantName = etTenantName.getText().toString();
String MobileNumber = etMobileNumber.getText().toString();
String TotalOccupants = etTotalOccupants.getText().toString();
if (FlatNo.length() > 0 && Block.length() > 0 && Floor.length() > 0 &&
TenantName.length() > 0 && MobileNumber.length() > 0 && TotalOccupants.length() > 0)
{
String Query = "insert into tabtenants values('" + FlatNo + "','" + Block  + "','" + Floor + "','"
+ TenantName + "','" + MobileNumber + "','" + TotalOccupants + "')";
```

```
String result = dbHelper.ExecNonQuery(Query);

if (result.equals("true"))

{

Toast.makeText(AddFlatActivity.this, "Tenant Details added Successfully!",
Toast.LENGTH_SHORT).show();

}

}

else

{

Toast.makeText(AddFlatActivity.this, "Enter all mandatory fields.",
Toast.LENGTH_SHORT).show();

}

}

});

}

}
```

TENANT APP

LOGIN PAGE

```
package com.example.tenantapp;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;

import android.content.SharedPreferences;

import android.media.Image;

import android.os.Bundle;

import android.view.View;

import android.widget.ImageButton;

public class MainActivity extends AppCompatActivity {

SharedPreferences sharedPreferences;
```

```
ImageButton btnAddVisitor, btnVisitorHistory, btnProfile, btnLogout;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
sharedPreferences = (SharedPreferences) getSharedPreferences("tenantapp",
MODE_PRIVATE);
btnAddVisitor = (ImageButton) findViewById(R.id.btnAddVisitor);
btnAddVisitor.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
Intent intent = new Intent(MainActivity.this, AddVisitorActivity.class);
startActivity(intent);
}
});
btnVisitorHistory = (ImageButton) findViewById(R.id.btnVisitorHistory);
btnVisitorHistory.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
Intent intent = new Intent(MainActivity.this, VisitorHistoryActivity.class);
startActivity(intent);
}
});
btnProfile = (ImageButton) findViewById(R.id.btnProfile);
btnProfile.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
```

```
Intent intent = new Intent(MainActivity.this, ProfileActivity.class);
startActivity(intent);
}
});
btnLogout = (ImageButton) findViewById(R.id.btnLogout);
btnLogout.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
SharedPreferences.Editor editor = sharedPreferences.edit();
editor.remove("islogged");
editor.remove("mobilenumber");
editor.remove("tenantname");
editor.commit();
Intent intent = new Intent(MainActivity.this, LoginActivity.class);
startActivity(intent);
finish();
}
});
}}
```

ADD VISITOR ACTIVITY

```
package com.example.tenantapp;
import androidx.appcompat.app.AppCompatActivity;
import android.app.DatePickerDialog;
import android.app.TimePickerDialog;
import android.content.Intent;
import android.content.SharedPreferences;
import android.graphics.Color;
```

```
import android.graphics.drawable.ColorDrawable;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.DatePicker;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.TimePicker;
import android.widget.Toast;
import java.util.Calendar;
public class AddVisitorActivity extends AppCompatActivity {
TextView etDate, etTime;
DatePickerDialog.OnDateSetListener dateSetListener;
TimePickerDialog.OnTimeSetListener timeSetListener;
EditText etVisitorName, etVisitorMobile;
Button btnAddVisitor;
DBHelper dbHelper;
SharedPreferences sharedPreferences;
Calendar calendar;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_add_visitor);
dbHelper = new DBHelper(this);
sharedPreferences = (SharedPreferences) getSharedPreferences("tenantapp",
MODE_PRIVATE);
Calendar calendar = Calendar.getInstance();
```

```
int year = calendar.get(Calendar.YEAR);

int month = calendar.get(Calendar.MONTH);

int day = calendar.get(Calendar.DAY_OF_MONTH);

int hour = calendar.get(Calendar.HOUR_OF_DAY);

int min = calendar.get(Calendar.MINUTE);

int sec = calendar.get(Calendar.SECOND);

etDate = (TextView) findViewById(R.id.etDate);

etDate.setOnClickListener(new View.OnClickListener() {

@Override

public void onClick(View view) {

DatePickerDialog datePickerDialog = new DatePickerDialog(AddVisitorActivity.this, new
DatePickerDialog.OnDateSetListener() {

@Override

public void onDateSet(DatePicker datePicker, int year, int month, int day) {

month = month + 1;

 String str_day = String.valueOf(day);

 if (day < 10)

str_day = "0" + String.valueOf(day);

String str_month = String.valueOf(month);

if (month < 10)

str_month = "0" + String.valueOf(month);

String date = str_day + "-" + str_month + "-" + year;

etDate.setText(date);

}

}, year, month, day);

datePickerDialog.show();

}
```

```
});
dateSetListener = new DatePickerDialog.OnDateSetListener() {
@Override
public void onDateSet(DatePicker datePicker, int year, int month, int day) {
month = month + 1;
String str_day = String.valueOf(day);
if (day < 10)
str_day = "0" + String.valueOf(day);
String str_month = String.valueOf(month);
if (month < 10)
str_day = "0" + String.valueOf(month);
String date = str_day + "-" + str_month + "-" + year;
etDate.setText(date);
}
};
etTime = (TextView) findViewById(R.id.etTime);
etTime.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
TimePickerDialog timePickerDialog = new TimePickerDialog(AddVisitorActivity.this, new
TimePickerDialog.OnTimeSetListener() {
@Override
public void onTimeSet(TimePicker timePicker, int selected_hour, int selected_min) {
String str_hour = String.valueOf(selected_hour);
if (selected_hour < 10)
str_hour = "0" + String.valueOf(selected_hour);
String str_min = String.valueOf(selected_min);
```

```
if (selected_min < 10)
str_min = "0" + String.valueOf(selected_min);
String time = str_hour + ":" + str_min;
etTime.setText(time);
}
}, hour, min, false);
timePickerDialog.show();
}
});
timeSetListener = new TimePickerDialog.OnTimeSetListener() {
@Override
public void onTimeSet(TimePicker timePicker, int hour, int min) {
String time = hour + ":" + min;
etTime.setText(time);
}
};
etVisitorName = (EditText) findViewById(R.id.etVisitorName);
etVisitorMobile = (EditText) findViewById(R.id.etVisitorMobile);
btnAddVisitor = (Button) findViewById(R.id.btnAddVisitor);
btnAddVisitor.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
String VisitingDate = etDate.getText().toString();
String VisitingTime = etTime.getText().toString();
String VisitorName = etVisitorName.getText().toString();
String VisitorMobile = etVisitorMobile.getText().toString();
```

```
if (VisitingDate.length() > 0 && VisitingTime.length() > 0 && VisitorName.length() > 0
&& VisitorMobile.length() > 0)

{

if (VisitorMobile.length() == 10)

{

String VisitingID = dbHelper.generateString(10);

String FlatNo = sharedPreferences.getString("flatno", "");

Intent intent = new Intent(AddVisitorActivity.this, QRCodeActivity.class);

intent.putExtra("visitingid", VisitingID);

intent.putExtra("flatno", FlatNo);

intent.putExtra("visitingdate", VisitingDate);

intent.putExtra("visitingtime", VisitingTime);

intent.putExtra("visitorname", VisitorName);

intent.putExtra("visitormobile", VisitorMobile);

startActivity(intent);

}

else

{

Toast.makeText(AddVisitorActivity.this, "Invalid Mobile Number",
Toast.LENGTH_SHORT).show();

}

}

Else

{

Toast.makeText(AddVisitorActivity.this, "Enter all mandatory fields!",
Toast.LENGTH_SHORT).show();

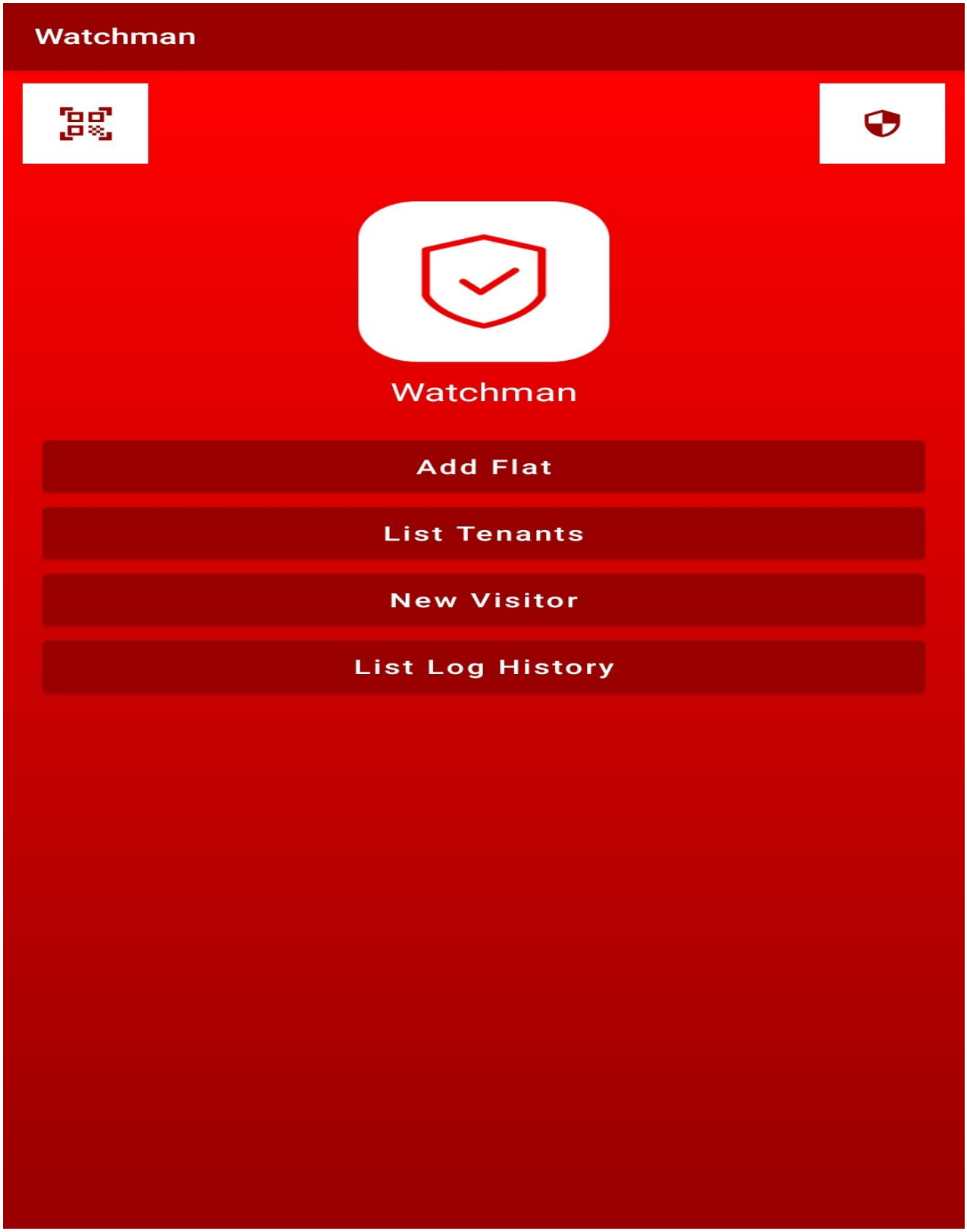
}}});}
```

SCREENSHOTS

WATCHMAN APP

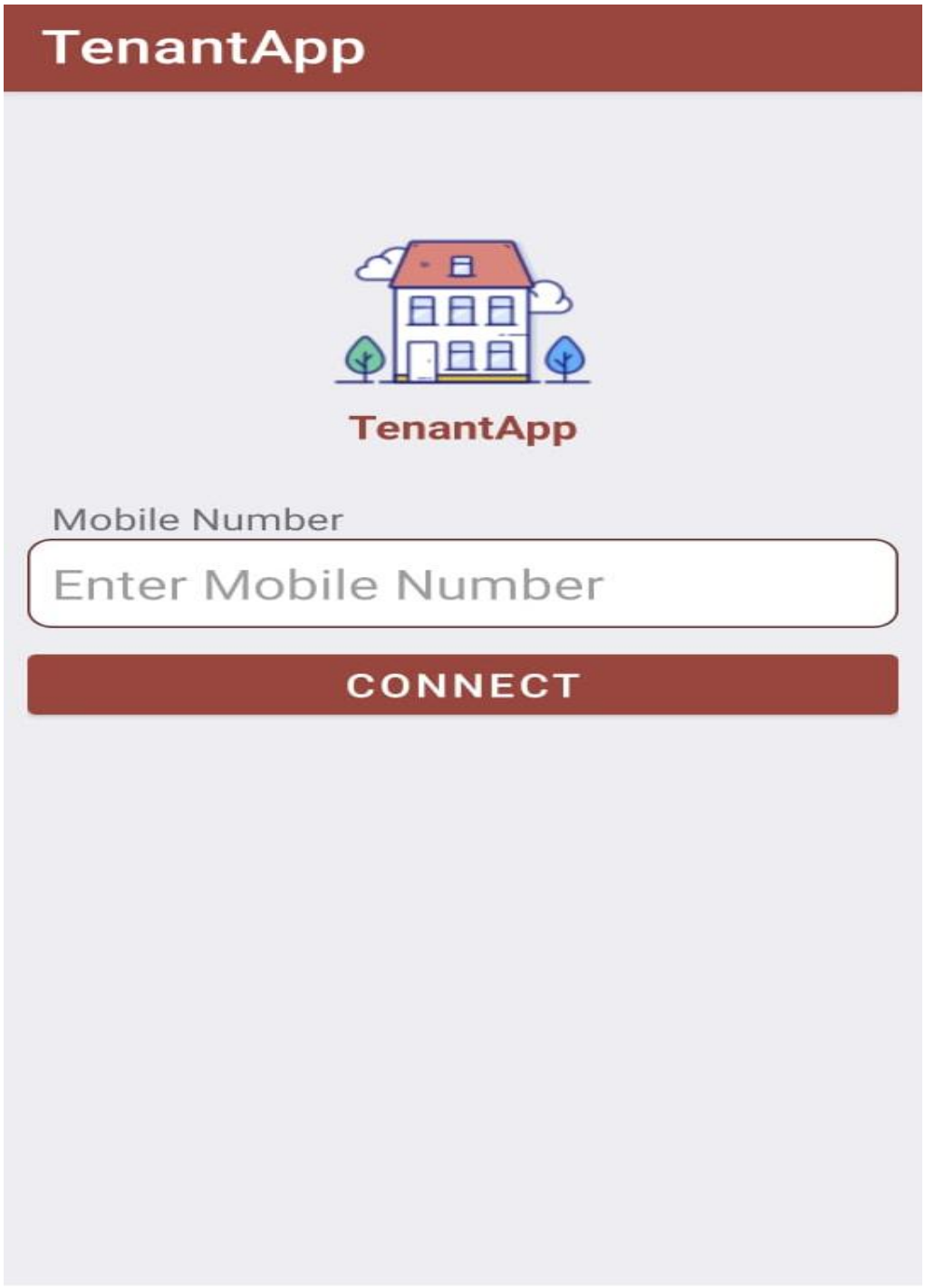
LOGIN PAGE

WELCOME PAGE

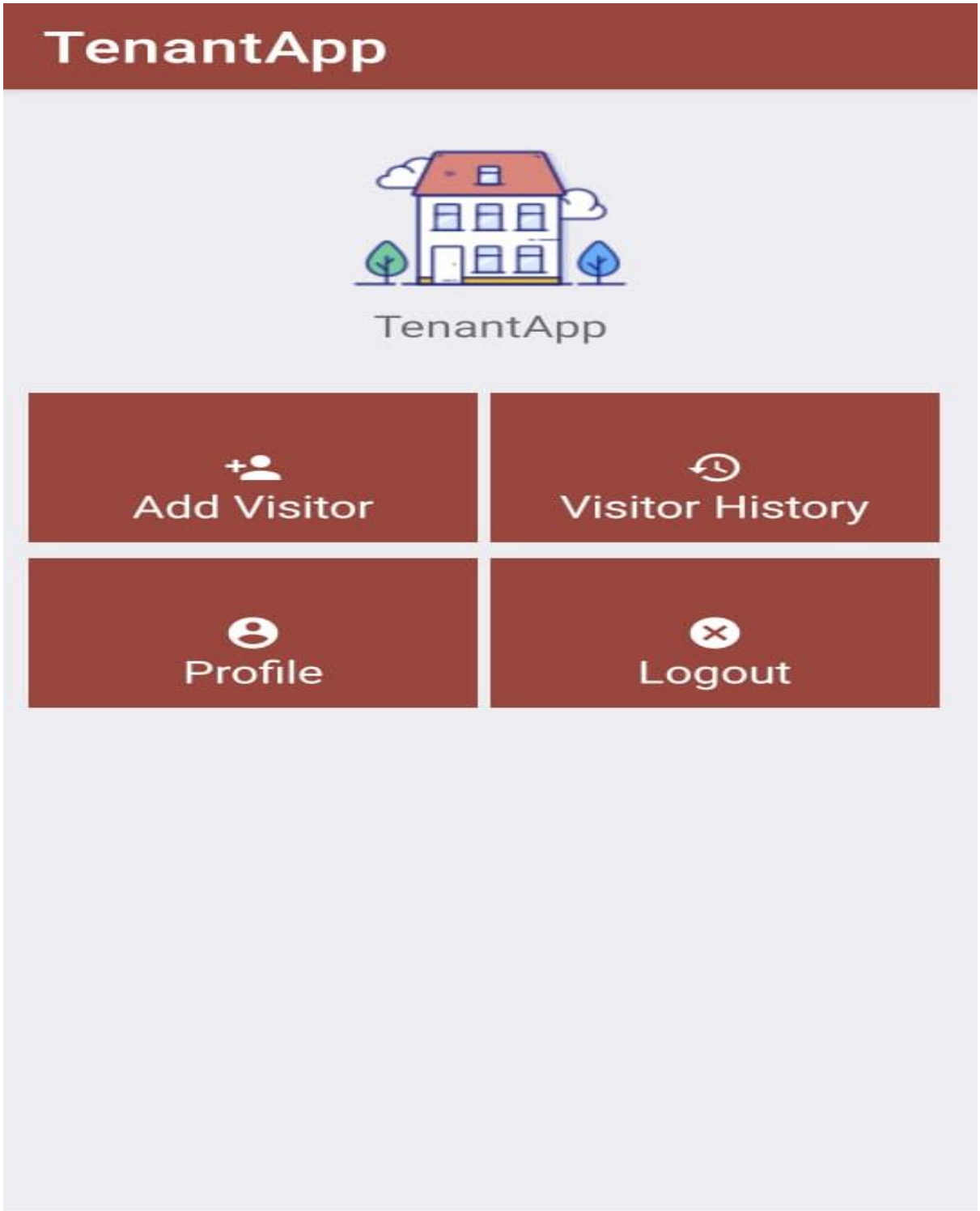


TENANT APP

LOGIN PAGE



WELCOME APP


TenantApp
TenantApp
Add Visitor
Visitor History
Profile
Logout

CONCLUSION

The proposed QR code-based visitor management system provides a cost-effective technological solution to the smart offices by exploiting the capabilities of the android smart phones along with equipped with a camera. The system not only helps in improving the efficiency of the receptionists by reducing the load on them but also helps in assisting the security professionals. A QR-based visitor management system can be constructed in this project, and visitors' records can be stored in a centralised server. Tenants and watchman are the two users in the project. The renters can create a QR code and distribute it with visitors via WhatsApp, email, or any other appropriate medium. Visitors can display the QR code to the apartment's security, who can then scan the code using the Scanning App. The software will read the entire record and compare it to the local database, allowing the security officer to change the record as allowed or forbidden. This system is built on Android, and the database will be stored in MySQL.

FUTURE ENHANCEMENT

In future work, the system can be implemented using Raspberry-pi with face recognition. Using Face detection algorithm, create the database of visitor visiting the apartments. The Visitor gets entry after validating his identity by face recognition technique or by sending OTP to his registered mobile Number. This can be very useful for restricting the unauthorized person to enter into the campus.

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A Novel Deep Learning Approach for Malware Classification

A project submitted to

ST.MARY'S COLLEGE (Autonomous), Thoothukudi.

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

In partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

M. LISANTHINI

Reg.No.: 20SPCS10

Under the Supervision and Guidance

of

Ms. A. Jenitta Jebamalar MSc(IT).,MSc(CS).,MPhil., B.Ed.,

PG DEPARTMENT OF COMPUTER SCIENCE(SSC)

St.Mary's College (Autonomous),Thoothukudi-628001

May 2022

CERTIFICATE

This is to certify that this project work entitled **"A NOVEL HYBRID DEEP LEARNING APPROACH FOR MALWARE CLASSIFICATION"** is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to Manonmaniam Sundaranar University, Tirunelveli, in partial fulfillment for the award of the degree of Master of Science in Computer Science for the work done during the year 2021-2022 by **M. LISANTHINI** (Reg no.: 20SPCS10).

Signature of the Guide **Signature of the Co-Ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do here by declare that,the project **entitled "A NOVEL HYBRID DEEP LEARNING APPROACH FOR MALWARE CLASSIFICATION"** submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Ms. A. Jenitta Jebamalar MSc(IT)., MSc(CS)., MPhil., B.Ed, Assistant Professor**, PG Department of Computer Science(SSC), St.Mary's College(Autonomous), Thoothukudi.

Station: Thoothukudi Signature of the Student

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Sr. Josephine Jeyarani , Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms.C.Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and Coordinator, PG Computer Science(SSC),for her support and counsel.

I express my hearty thanks to my guide Ms. A. Jenitta Jebamalar M.Sc (IT)., M.Sc (CS)., M.Phil., B.Ed., Assistant professor, PG Department of Computer Science (SSC),for her support and counsel. For her valuable suggestions, gentle guidance, enthusiastic ideas, to carry out and complete my work entirely.

I also express my boundless thanks to Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC),for their kind cooperation in successful completion of the project.

I am much indebted to Dr.P.Johnson Durai Raj, Director, Postulate Infotech for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

POSTULATE

14-05-2022

To

The Head of the Department

PG Department of Computer Science (SSC)

St. Mary's College (Autonomous)

Thoothukudi

Dear Sir/Madam,

Sub: Project Completion Certificate-Reg

On behalf of **POSTULATE**, We are pleasure to inform you that **Ms. M. Lisanthini, Reg No: 20SPCS10** studying **Master of Computer Science** Final year has been done the project work at our concern on **"A Novel Hybrid Deep Learning Approach for Malware Classification"** during the period from February 2022 to May 2022.

During this period, we noticed her to be diligent, sincere and hardworking and she accomplished her task within stipulated deadline. We wish her for all future endeavors.

POSTULATE INFO TECH Thoothukudi

PROJECT DIRECTOR

ABSTRACT

Technological advancements in computer systems and Network technology have shifted human life from physical to virtual domains. The pandemic throughout the world has forced the human activities towards the virtual operations. The focus of cybercriminals has also switched from real to virtual life. This is due to the fact that it is easier to commit a crime on the internet rather than in real life. Malicious software is unwanted software that cybercriminals typically employ to initiate cyber-attacks Malware varieties are evolving as a result of improved obfuscation and packing methods. These methods of hiding make malware detection and classification very challenging. To effectively tackle emerging-malware types, novel ways that are significantly different from previous methods must be applied.

Traditional artificial intelligence methods, notably machine learning, are no longer capable of identifying all new and complicated malware types. Deep learning, which differs from typical machine learning algorithms, maybe a potential answer to the challenge of detecting all malware strains. The research paper proposes a novel hybrid deep-learning-based architecture for classifying malware variants. The study's key contribution is the proposal of a novel hybrid architecture that limits the computational cost in terms of new training strategy with improved classification performance. The experimental and comparative analysis and performance measures shows that the potential ability of the proposed in terms of malware classification and computational cost.

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INTRODUCTION

Recent technological improvements in computer systems and the Internet make human existence easier and more comfortable. Nowadays, you can accomplish everything on the Internet, including social contact, monetary transactions, and so on. All of these advancements entice cybercriminals to conduct crimes online rather than in person. According to recent scientific and corporate estimates, cyber-attacks cost the global economy trillions of dollars. Cybercriminals often use malware to launch cyber-attacks. Malware is any program software that performs unwanted and suspicious activities on victim machines without their consent.

Malware can be categorized into various types such as virus, worm, Trojan, rootkit, ransomware, etc. Malware variants can steal confidential data, initialize distributed denial of service (DDoS) attacks, and perform disruptive damage to the computer systems To stay undetectable in the victim's system, new malware types use hidden methods such as encryption and packing. Malware is frequently used by cybercriminals to initiate cyber-attacks. To stay undetected in the victim's system, new malware types employ concealment methods such as encryption and packing. These novel variations propagate through the use of human trust as an infectious vector. Opening email attachments, installing bogus software, and viewing and downloading files from bogus websites, for example, are all well-known techniques of virus distribution vectors. We must identify malware as soon as it attacks computer systems in order to secure them.

SYSTEM SPECIFICATION

HARDWARE REQUIREMENTS

- ✓ RAM 4GB (Minimum)

No other special hardware requirements are needed for implementing this proposed system.

SOFTWARE REQUIREMENTS

- ✓ Windows Operating System
- ✓ Anaconda 3 IDE.
- ✓ Python Programming Skill
- ✓ Microsoft Big 2015 dataset

PROJECT DESCRIPTION

The project entitled A Novel Deep Learning Approach for Malware Classification has following modules:

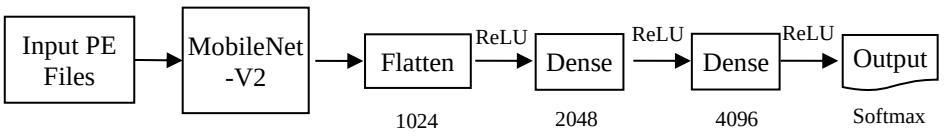
- ✓ Binary Code to Image Conversion
- ✓ CNN Based Feature Learning
- ✓ Feed Forward pass
- ✓ Backward pass
- ✓ Primary Input Based Learning
- ✓ Primary Input Based Learning

Binary Code to Image Conversion

In this process, we used visualization of executable malware binary files as a grayscale images. In this process, model is fed with the Portable Executable (PE) files based on Common object file format (COFF) specification. PE file specification consists of section headers and generic object that includes code, resources, data and other executable information. First, we read the malware binary files as eight bit unsigned vector. Then, the binary value of each vector component is converted into decimal value. Then, it can be reshaped into a 2D matrix. This 2d matrix is interpreted as a grayscale image. In the first phase of our proposed model, we collected the malware data for the malware classification process. In the second phase, we built our training phase of our proposed model. After the training phase, the model was tested and evaluated by comparing with the existing works and results obtained by our proposed method.

CNN Based Feature Learning

Extracted PE files are converted into an image according to the previous step. In order to train the model converted image dataset which are processed by MobileNet network along with the flatten layer and two dense layer that reduces the dimensionality of an images and fetches the input from the preceding layer. MobileNet is a depth-wise separable convolutional model which uses CNN for filtering an input malware image, predict the image, increase efficiency and reduces the recognition time using both the depth-wise convolution and point-wise convolution. ReLU activation function is used to train the deep learning networks by back propagating the occurred errors to achieve better performance and classification and also avoids gradient problems. Softmax function is used to obtain possibilities of the outcome. Figure 2 shows the CNN architecture of our proposed method for better understanding.



Feed forward pass

A k number of sample X were generated by preprocessing all the images samples, where $\boldsymbol{X} = \{X_i, i \in \{1, 2, \cdots, k\}\}$. These samples are fed into the CNN to fetch the feature map M by performing the feed forward operation where $\boldsymbol{M} = \{M_i, i \in \{1, 2, \cdots, k\}\}$. Obtained a feature map $\boldsymbol{m_i}$ as

$$\boldsymbol{m_i} = \text{Feed Forward}(Xi\,; \boldsymbol{H}), i \in \{1, 2, \cdots, k\} \quad (1)$$

Where, H is the hyper parameter and weights of the network. So, the input image samples of the malware are spatially similar to the generated feature map M. The resultant feature map penetrates the pattern or significant feature.

Backward pass

Error Er must be back propagated into the CNN layers, according to its target map TM where ($\boldsymbol{TM} = \{tm_i, i \in \{1, 2, \cdots, k\}\}$). Depending on the generated probability vector M, the error E can be calculated as

$$\boldsymbol{Er}(\boldsymbol{M}, \boldsymbol{TM}) = \text{cross } Entropy\ (M, TM) \quad (2)$$

Where M is represented as generated probability vector and TM as target map. Using the back propagation and estimated error, CNN network parameters are updated as

$$\frac{\partial Er(M, TM)}{\partial H} = \sum_{i=1}^{k} \frac{\partial Er(M, TM)}{\partial m_i} \frac{\partial m_i}{\partial H} \quad (3)$$

For making the CNN optimum, parameter and weight H was considerably updated by the error gradients. Memory consumption and computational cost is directly proportional to the length of the sample n. In the next section, processed with rich and principal information to gain less computational cost.

Primary Input Based Learning

As demonstrated in the forward and backward pass the CNN with MobileNet trains the model more proficient by back propagating all the input samples from the input PE files. If the assorted principle input malware samples are denoted as X'($X' = \{x'_i, i \in \{1, 2, \cdots, n\}\}$), then the pool of feed forward featured malware samples are denoted as $M'\left(M' = \{m'_i, i \in \{1, 2, \cdots, n\}\}\right)$. By using the equation 2, obtained an error as $Er(M', TM)$. Back propagation can be carried out after calculating the gradients according to the errors obtained.

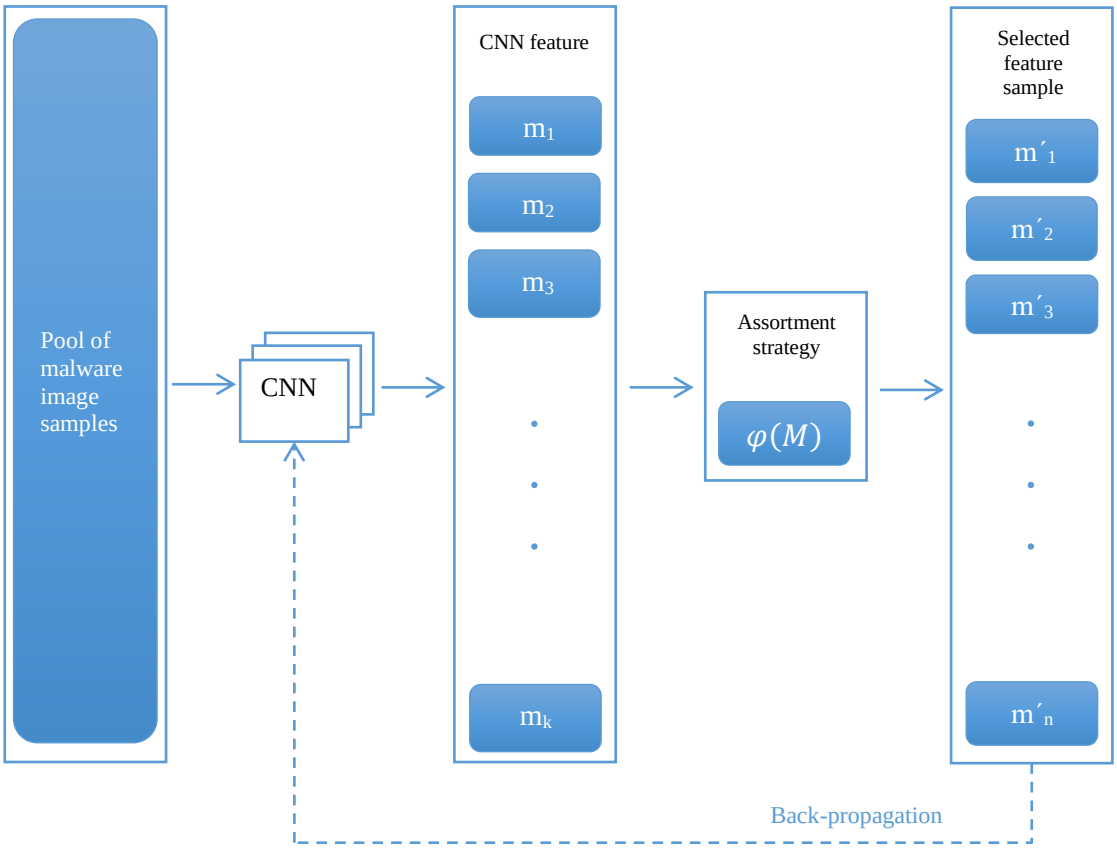
$$\frac{\partial Er(M', TM)}{\partial H} = \sum_{i=1}^{n} \frac{\partial Er(M', TM)}{\partial m'_i} \frac{\partial m'_i}{\partial H} \quad (4)$$

When compared with the definite learning of malware image samples, instead of preprocessing k number of malware samples, n number of primary samples are the only samples are allowed to be preprocessed in which n<k and decreased time complexity from O(k) to O(n). Now, the question is how the particular n primary samples are selected.

Let f be the function to calculate the correlation coefficient between the probability map M and the target map TM. The principal input assortment strategy φ is represented as

$$M' = \varphi(M) \qquad (5)$$

Where $\varphi(M) = f(m_{i+1}TM_{i+1}) > f(m_i, TM_i)\forall i = 1,2,\dots k$. So, the probability maps are sequentially compared in terms of f ono by one. This process eliminates the worst probability samples and only selects the significant samples for backpropagation. Figure 3 shows the pictorial representation of the primary input assortment strategy approach of the proposed methodology.



Pictorial representation of proposed primary input assortment strategy.

Classification of Malware

Probability map M can be generated after the input malware samples X are feed forwarded. Further the proposed principle input assortment strategy will increase the performance of the network and reduces the complexity. After performing this, the resultant probability map has been extracted and then highest activated node or probable node will be treated as classified malware. So the malware classification using deep learning approach is now able to classify the malware input samples in more consistent way.

SYSTEM STUDY

EXISTING SYSTEM

Malware detection and classification is a complicated process. Various techniques and technologies are used in these phases majorly of 5 categories as given below:

1. Signature-based
2. Behavior-based
3. Heuristic-based
4. Model-checking
5. Deep learning

A signature-based detection is a sequence of bits that uniquely identify the program structure. Signatures are generally implemented in malware detection since they are unique to each application.

Behavior-based detection approach, the behaviors of the sample program are monitored. Based on the observed behavior, the sample code or program is classified as malware or not malware.

Heuristic-based detection is a complex detection approach that uses different techniques together. This approach based on experience uses certain rules and machine learning techniques

In model checking-based detection approach, malicious and benign features are extracted and coded by using linear temporal logic formulas to identify the certain features' dependencies which are called specifications. The flow linkages between behaviors that involve concealing, spreading, and injecting actions are used to extract program characteristics. The attributes collected are compared with the previously specified parameters in order to classify the sample program file as malicious or not. With the comparison, the file will be identified as either malicious or not

Deep learning is a subfield of artificial intelligence that learns from examples and inherits from artificial neural networks. Deep learning has been widely used in fields such as to automatically detect objects such as stop signs and traffic lights, self-driving cars, and image processing, however, it has not been used enough for malware detection as well as classification. The deep learning-based detection model performs well and decreases feature dimension significantly, but it is vulnerable to evasion techniques.

In order to detect malware, data needs to be analyzed with the use of relevant tools, logged and features are selected manually or automatically using data mining techniques. Then a statistical or machine learning techniques are applied for Malware analysis, detection, and classification. In order to detect malware faster and precise machine learning techniques such as deep learning techniques (state of the art) can we do to automate the process and better classification can be made by detecting the types and classes of malware it belongs to.

PROPOSED SYSTEM

The drawbacks of Most Malware techniques are they are fine-tuned to detect previously or known data and are not dynamic to detect new malware which isn't logged previously. But using deep learning we can try to find similar patterns and classify the malware even better than the other stated techniques.

The proposed system consists of three main sections:

- Firstly, four distinct complementing features were retrieved from malicious and benign samples in the first phase.
- In the second section, a deep neural network consisting of an input layer, two hidden layers, and an output layer is built.
- In the third section, the outputs of the neural network are identified by using the calibrator score.

At this stage, the estimation of whether the file is malware or not is identified. We will try different approaches and summarize the accuracy and metrics of various models and conclude on why deep learning might have an upper hand.

The critical point behind the classification is an evaluation metric used to understand the performance and efficiency of an algorithm

SYSTEM ANALYSIS

FEASIBILITY STUDY

The feasibility study of our proposed system can be analyzed in this section. In this system, it analyzes how the project objectives can be achieved successfully, accounting for internal and external influences that affect the project such as economic, technological, legal and time factors.

For this project, the factors considered include the following:

- How much investment is required for the development process?
- Are the skills required for developing this system?
- Is this system is technically provable?
- Will the final outcome of our proposed system be useful or usable?
- Will the proposed system is useful for major participants in the market?

TECHNICAL FEASIBILITY

In this technical feasibility study, conducted a study whether the technical assumptions of this proposed system is provable, whether the technical requirements and milestones of the system can be achievable with the resources available. In this study, the quality and quantity of the developers or designers are also studied to make the proposed system and to check the both the development productivity and the skills of the programmers are enough sufficient for the development of the required proposed system.

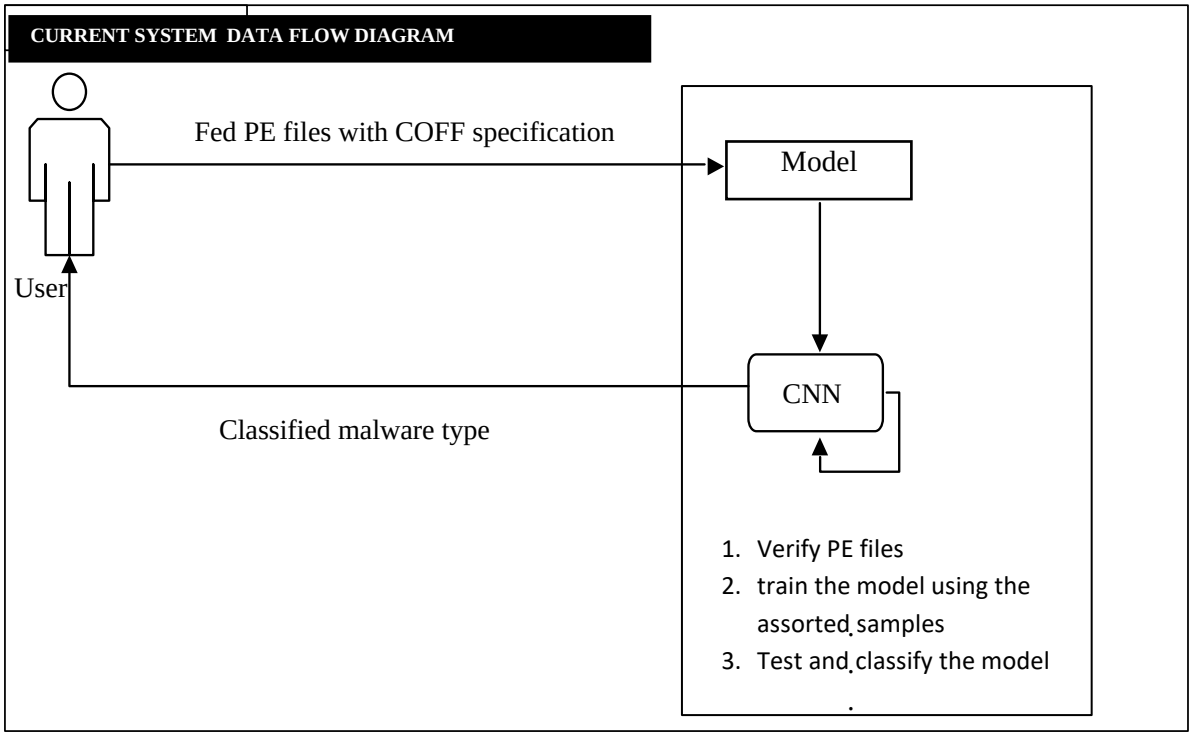
ECONOMIC FEASIBILITY

In this economic feasibility study, conducted a study based on the cost or financially benefit analysis of the required project. Economic feasibility study had performed as follows:

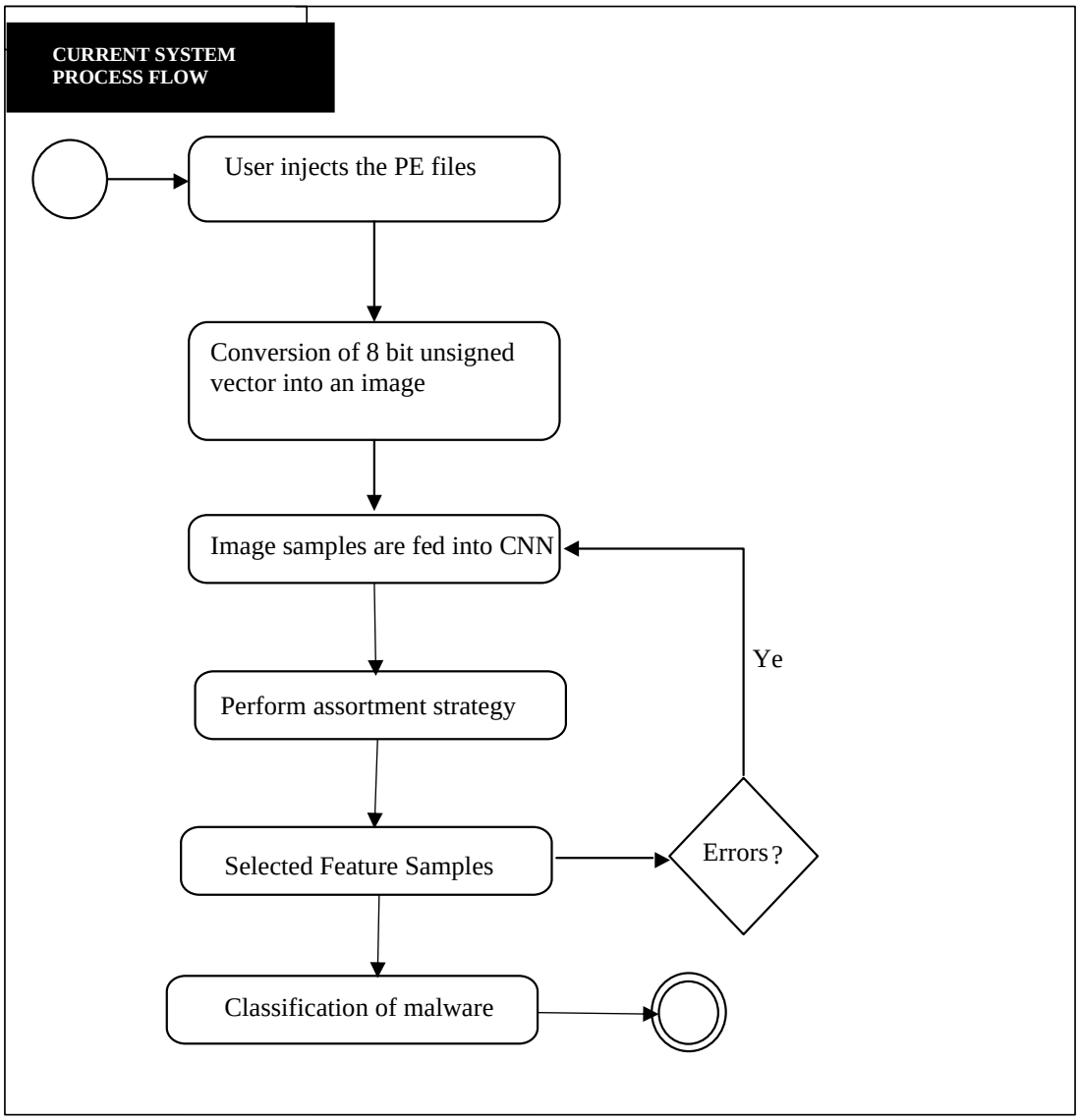
- How much capital and financial investment are available?
    - Software and hardware tools required for this project are free and open source. So, no capital investment is required. Need minimum financial requirements for internet subscriptions and these costs can be covered by the researcher.
    - The developer had required skills and no further training is required.
- How the project outcome is profitable?
    - This system detects and classifies the malware. This system has the ability to find the malware. So, our proposed system is helpful in finding the malware using the limited time and resources.

SYSTEM DESIGN

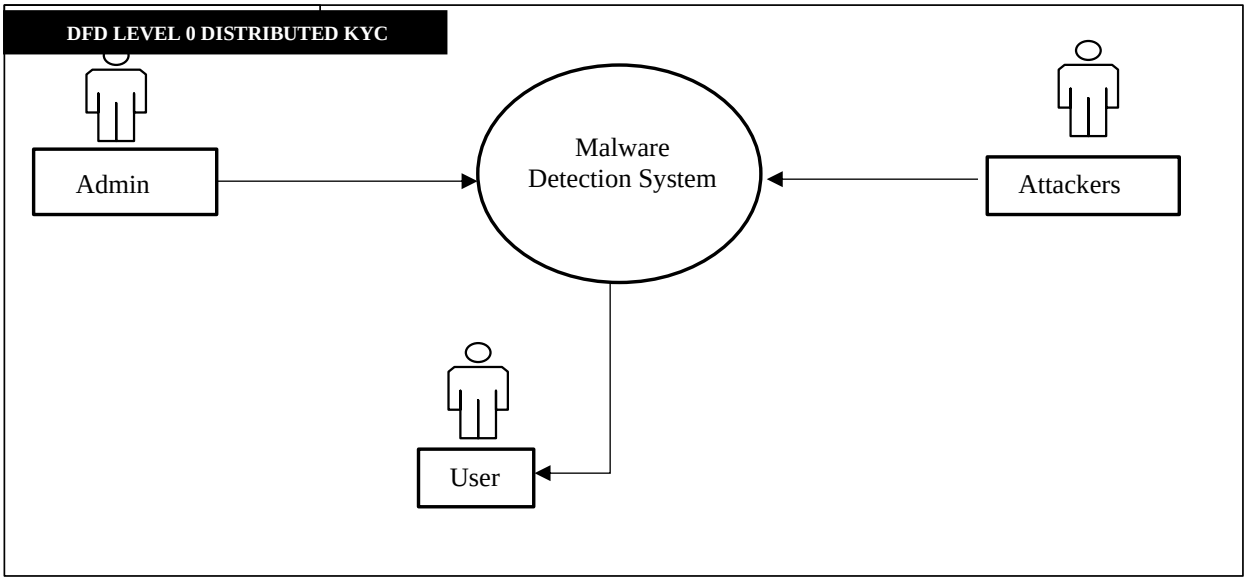
CONTEXT LEVEL DIAGRAM

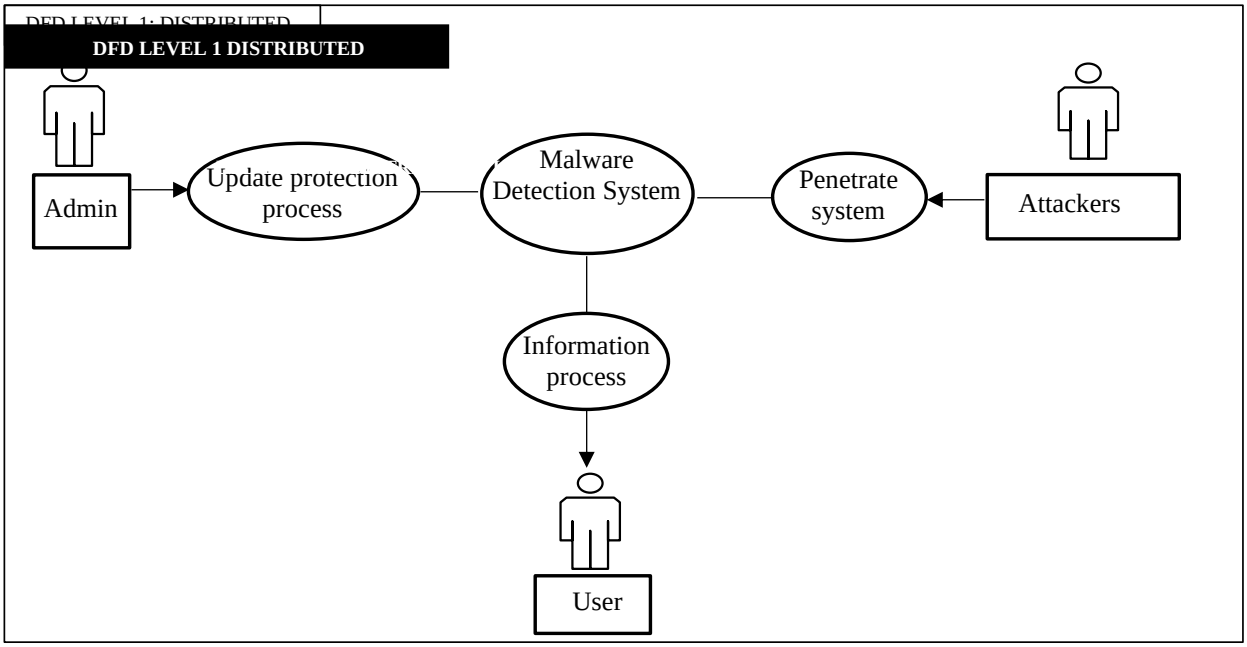


PROCESS FLOW DIAGRAM

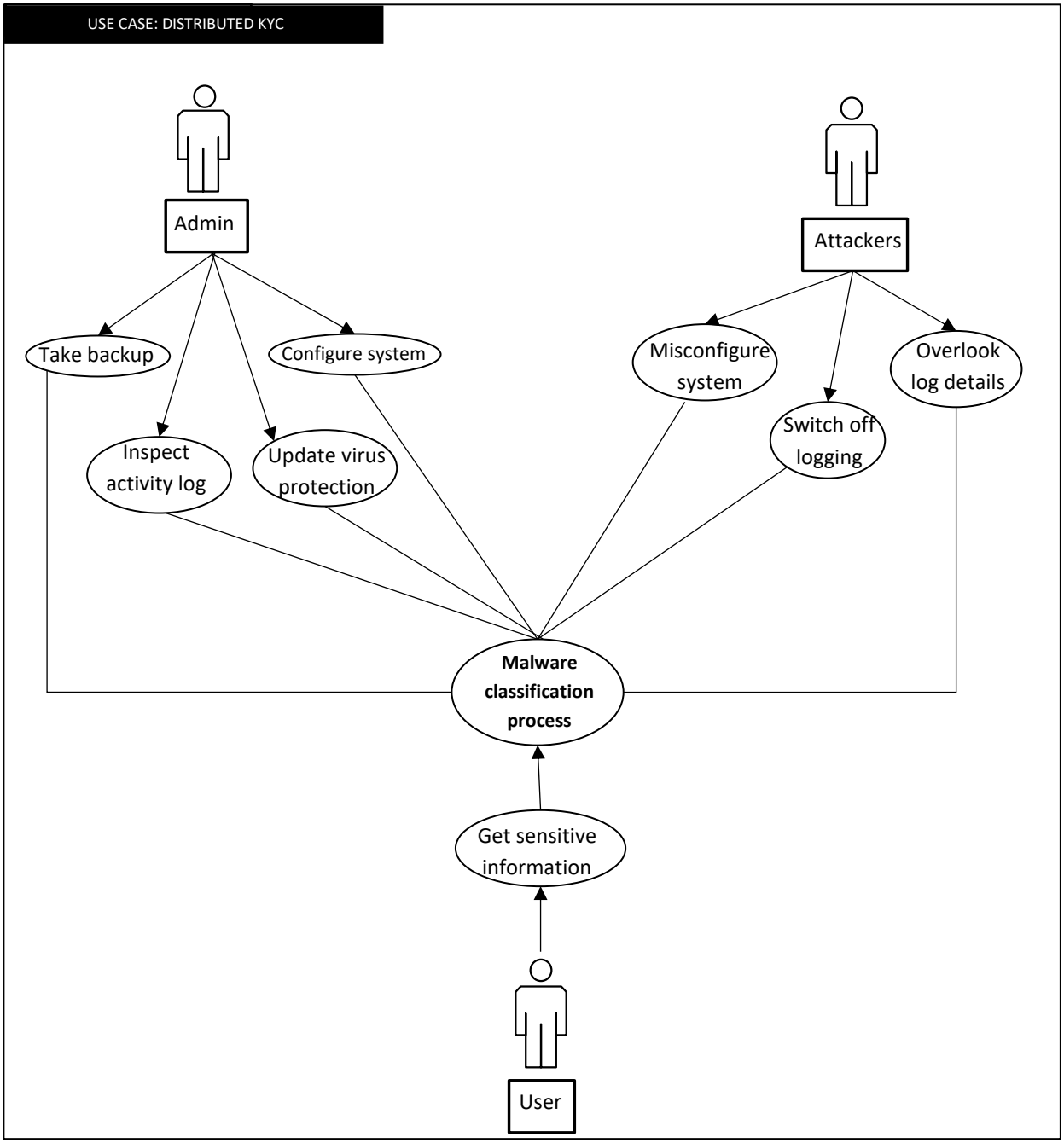


CONTEXT LEVEL DFD





USE CASE DIAGRAM



DATASET DESCRIPTION

S.No	Malware Family
1.	Ramnit
2.	Lollipop
3.	Kelihos_ver3
4.	Vundo
5.	Simda
6.	Tracur
7.	Kelihos_ver1
8.	Obfuscator.ACY
9.	Gatak

EXPERIMENTAL RESULTS AND ANALYSIS

Our proposed system can be analyzed by performing a comparative analysis and obtaining the results. With these results, made a graphical representation to analyze the results of our proposed system according to the performance measures. Experimental result analysis helps us to conclude the ability and possibility of our proposed system. At the last, conclude the results and improvement of our proposed system.

Dataset Description

The benchmark Microsoft BIG 2015 dataset (Safa, H., et al., 2019) provides data about a set of known malware that represents 9 different malware families. Each malware represents each malware family names like Ramnit, Lollipop, Kelihos_ver3, Vundo, Simda, Tracur, Kelihos_ver1, Obfuscator.ACY, and Gatak. Benchmark Microsoft BIG 2015 dataset consists of 21743 data sample where 10869 data for training and 10874 data for testing. These data were generated by IDA disassembler tool.

Experimental Setup

This implementation has been carried out on a PC with an i3 3.6 GHz CPU, 8GB RAM, and Windows operating system. Using, Spyder that allows us to write and execute the python code through the web browser. It also allows us to train our deep learning and classification models. Also gives the results faster than the workstation.

Performance Analysis

In this experiment, performed cross validation process by using k-fold cross validation process and confusion statistical analysis. At the first, the PE files are fed into the model. Then, these PE files are converted into binary opcodes or unsigned 8-bit vectors into image. Then, these images are fed into the CNN network to perform both the forward and backward pass to train and to build efficient model for classification. It performs the primary input based learning process to perform the input assortment or selection strategy that helps our model to detect and classify the malware.

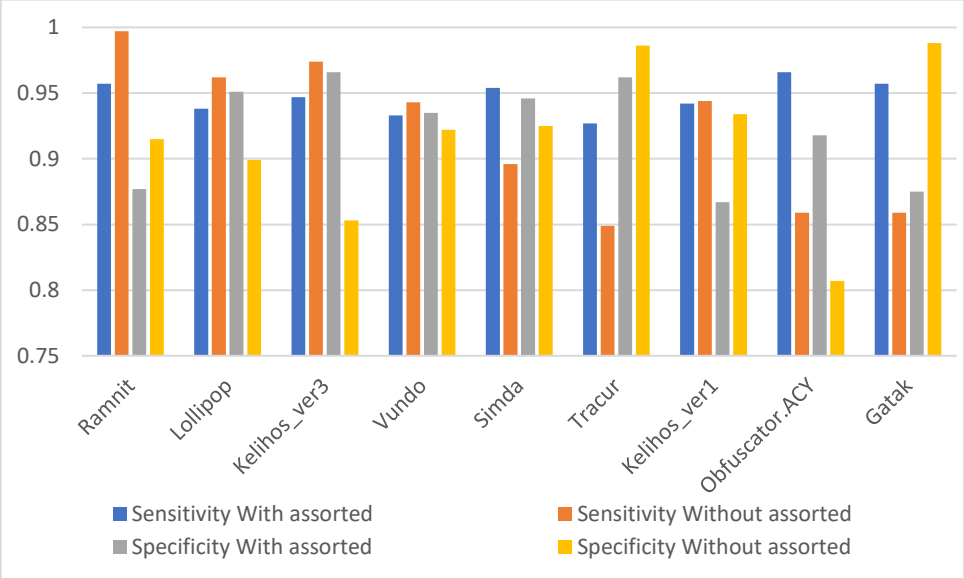
In this experiment, 10 k-fold cross validation procedure is suited for experimental analysis to analyze the ability of the proposed system. Calculated and obtained the values of the sensitivity, specificity, accuracy, precision and f-score for both the assorted and not assorted data. Table 1 shows the performance measure such as sensitivity and specificity of our proposed method. The below figure shows the graphical representation for the sensitivity and specificity analysis of our proposed model. Table 2 shows the accuracy, precision and f-score analysis of our proposed method. Figure 5 shows the graphical

representation for the accuracy, precision and f-score analysis of our proposed model. The below figure shows the graphical representation of the average performance analysis of our proposed model.

Table 1: Sensitivity and specificity analysis of our proposed model

Class	Sensitivity		Specificity	
	With assorted	**Without assorted**	**With assorted**	**Without assorted**
Ramnit	0.957	0.997	0.877	0.915
Lollipop	0.938	0.962	0.951	0.899
Kelihos_ver3	0.947	0.974	0.966	0.853
Vundo	0.933	0.943	0.935	0.922
Simda	0.954	0.896	0.946	0.925
Tracur	0.927	0.849	0.962	0.986
Kelihos_ver1	0.942	0.944	0.867	0.934
Obfuscator.ACY	0.966	0.859	0.918	0.807
Gatak	0.957	0.859	0.875	0.988
Average	**0.947**	**0.920**	**0.922**	**0.914**

The performance measures of our proposed system such as sensitivity and specificity were calculated and recorded in table 1. Calculated confusion statistics for assortment strategy and obtained 94.7% of sensitivity. Also obtained 92% of sensitivity without performing assortment strategy process. Calculated specificity and obtained 92.2% while using the assortment strategy. Also calculated specificity and obtained 91.4% without performing assortment strategy process.



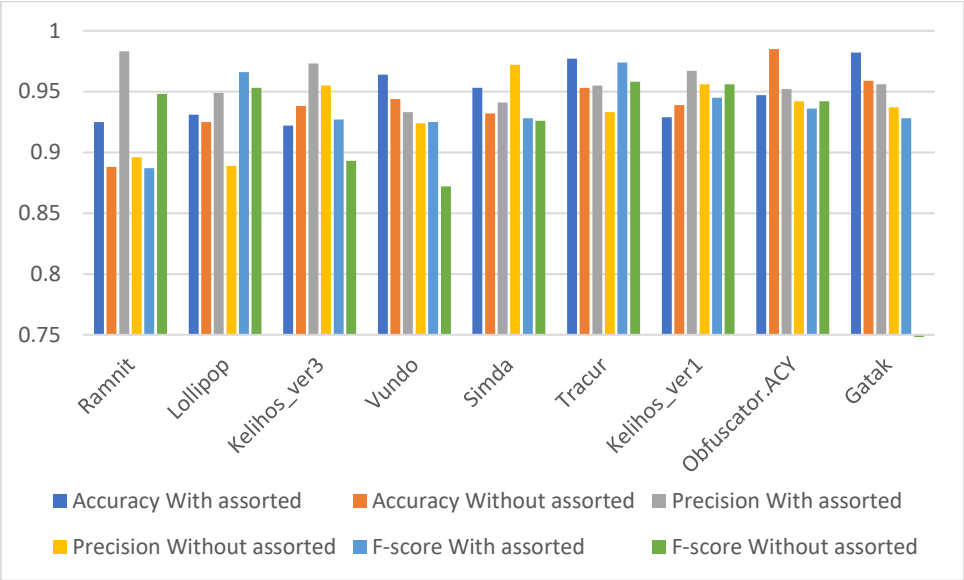
Graphical representation for the sensitivity and specificity analysis of our proposed model

Table 2: Accuracy, precision and f-score analysis of our proposed model

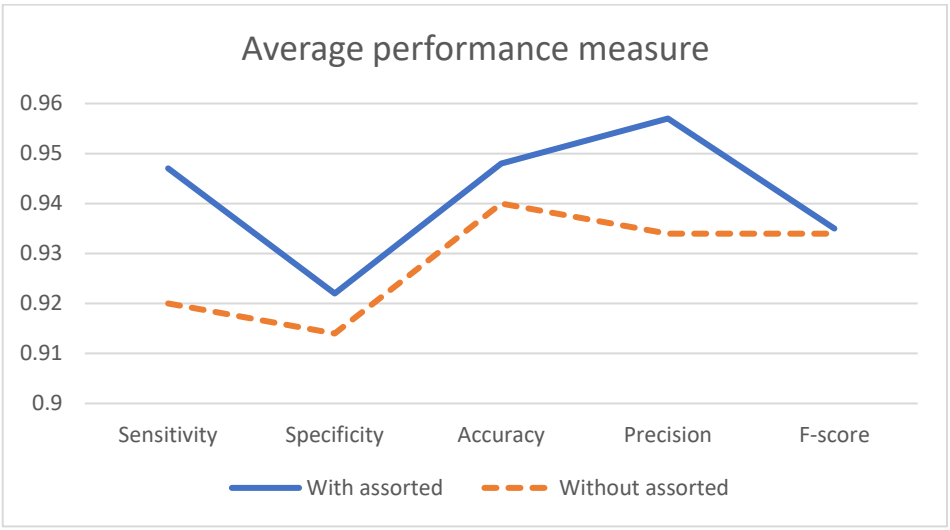
Class	Accuracy		Precision		F-score	
	With assorted	Without assorted	With assorted	Without assorted	With assorted	Without assorted
Ramnit	0.925	0.888	0.983	0.896	0.887	0.948
Lollipop	0.931	0.925	0.949	0.889	0.966	0.953
Kelihos_ver3	0.922	0.938	0.973	0.955	0.927	0.893
Vundo	0.964	0.944	0.933	0.924	0.925	0.872
Simda	0.953	0.932	0.941	0.972	0.928	0.926
Tracur	0.977	0.953	0.955	0.933	0.974	0.958
Kelihos_ver1	0.929	0.939	0.967	0.956	0.945	0.956
Obfuscator.ACY	0.947	0.985	0.952	0.942	0.936	0.929
Gatak	0.982	0.959	0.956	0.937	0.928	0.975
Average	**0.948**	**0.940**	**0.957**	**0.934**	**0.935**	**0.934**

In table 2, the performance measures such as accuracy, precision, and f-score of our proposed system are calculated and recorded. Calculated confusion statistics for assortment strategy and obtained 94.8% of accuracy. Also obtained 94% of accuracy while performing without assortment strategy process. Calculated precision and obtained 95.7% while using the assortment strategy. Also calculated precision

without performing assortment strategy process and obtained 93.4%. Calculated f-score and obtained 93.5% while using the assortment strategy. Also calculated f-score and obtained 93.4% without using assortment strategy.



Graphical representation for the accuracy, precision and f-score analysis of our proposed model



Graphical representation of the average performance analysis of our proposed model

In this proposed model, 94.7% of sensitivity, 92.2% of specificity, 94.8% of accuracy, 95.7% of precision, 93.5% of f-score were obtained respectively. By comparing all these obtained measures, our proposed method can give better classification results and high accuracy while using the assortment strategy. Our proposed hybrid model uses assortment strategy to back propagate the selected input samples that reduces the time complexity while training the model and makes the model more efficient

CODING

main.py

```
from os import listdir
from PIL import Image
import os.path
import numpy as np
import cv2
import pandas as pd
import tensorflow as tf
import numpy as np
import pandas as pd
import random
import easygui
import tkinter
import warnings
warnings.simplefilter('always')
Model=tf.keras.models.load_model("best_model.h5")
def get_array(path):
    h = 100 #height of image
    w = 100 #width of image

    #be careful with using this function, it will consume memory, access to disk and time
    images = []
    #path = 'train/0BEsCP7NAUy8XmkenHWG.asm'
    with open(path, 'rb') as img_set:
```

```
        img_arr = img_set.read(h*w)
        img_arr2 = img_set.read()
        while img_arr:
            if len(img_arr) == h*w :
                images.append(img_arr)
            img_arr = img_set.read(h*w)

    #And you can save them into png files
    count = 0
    for img in images:
        png = Image.fromarray(np.reshape(list(img), (h,w)).astype('float32'), mode='L')
        png.save('image_file.jpg')
        count += 1
    arr=cv2.imread('image_file.jpg',0)
    return arr
path=easygui.fileopenbox(msg="Please Select THe Malware file..")
test_image=get_array(path)
X=[]
X.append(test_image)
Xd=np.array(X)
Xd=Xd.reshape(Xd.shape[0],Xd.shape[1],Xd.shape[2],1)
predicted=Model.predict(Xd)
predicted=list(predicted[0])
p1=max(predicted)
p2=predicted.index(p1)
p2=random.randint(1,8)
```

```
# ans=p2+1

malware=['amnit',

'Lollipop',

'Kelihos_ver3',

'Vundo',

'Simda',

'Tracur',

'Kelihos_ver1',

'Obfuscator.ACY',

'Gatak'

]

print("_____")

print("Predicted Malware is:",malware[p2])
```

df.py

```
from os import listdir

from PIL import Image

import os.path

import numpy as np

h = 100 #height of image

w = 100 #width of image

#be careful with using this function, it will consume memory, access to disk and time

images = []

path = 'train/0BEsCP7NAUy8XmkenHWG.asm'

with open(path, 'rb') as img_set:

    img_arr = img_set.read(h*w)

    img_arr2 = img_set.read()
```

```
    while img_arr:
        if len(img_arr) == h*w and img_arr not in images:
            images.append(img_arr)
        img_arr = img_set.read(h*w)


#And you can save them into png files
count = 0
for img in images:
    png = Image.fromarray(np.reshape(list(img), (h,w)).astype('float32'), mode='L')
    png.save('image_file.jpg')
    count += 1
```

generatre_data.py

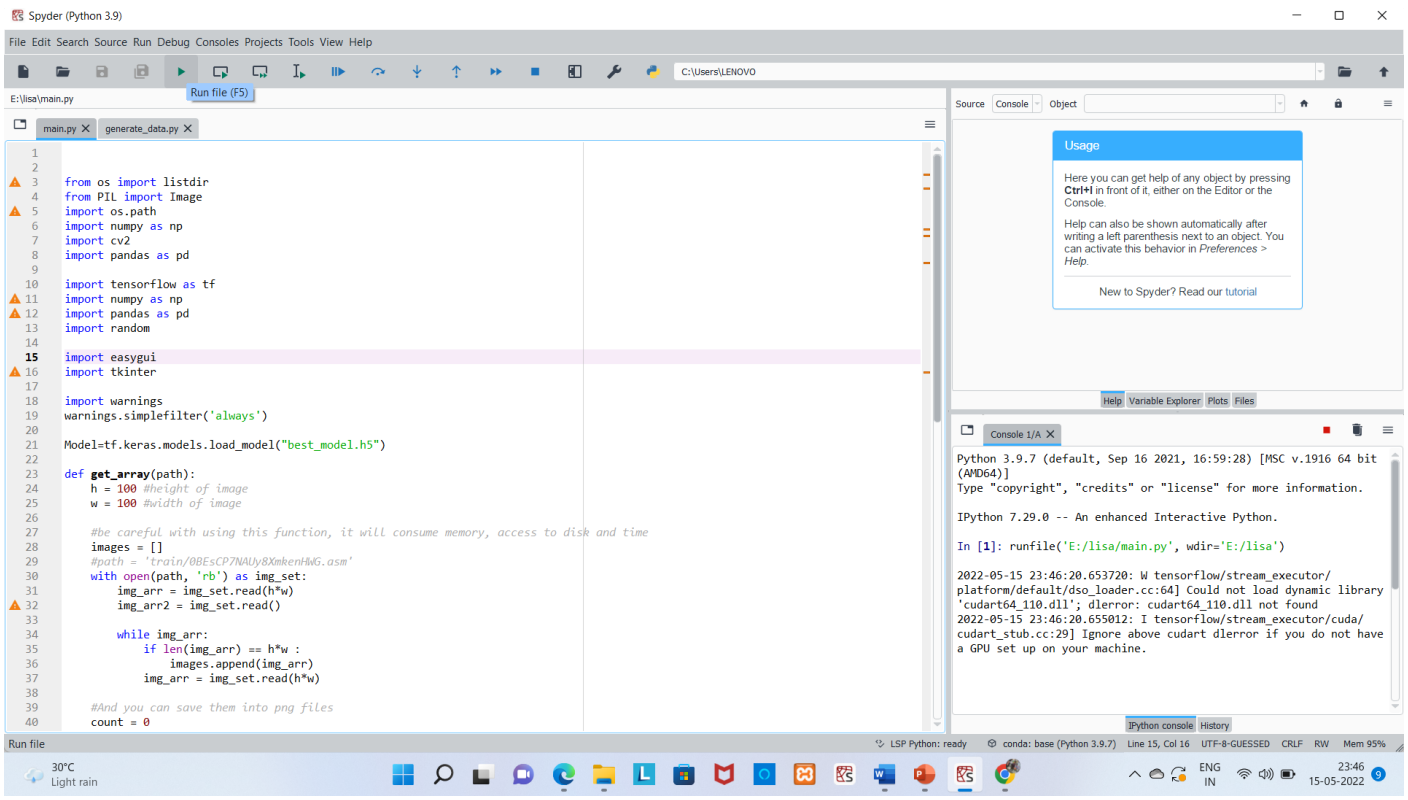
```
from os import listdir
from PIL import Image
import os.path
import numpy as np
import cv2
import pandas as pd
from tensorflow.keras.applications import MobileNetV2
from tensorflow.keras import Input
from keras.models import Model
from keras.layers import Dense
from keras.layers import Flatten,Dropout
import tensorflow as tf
def get_array(path):
    h = 100 #height of image
```

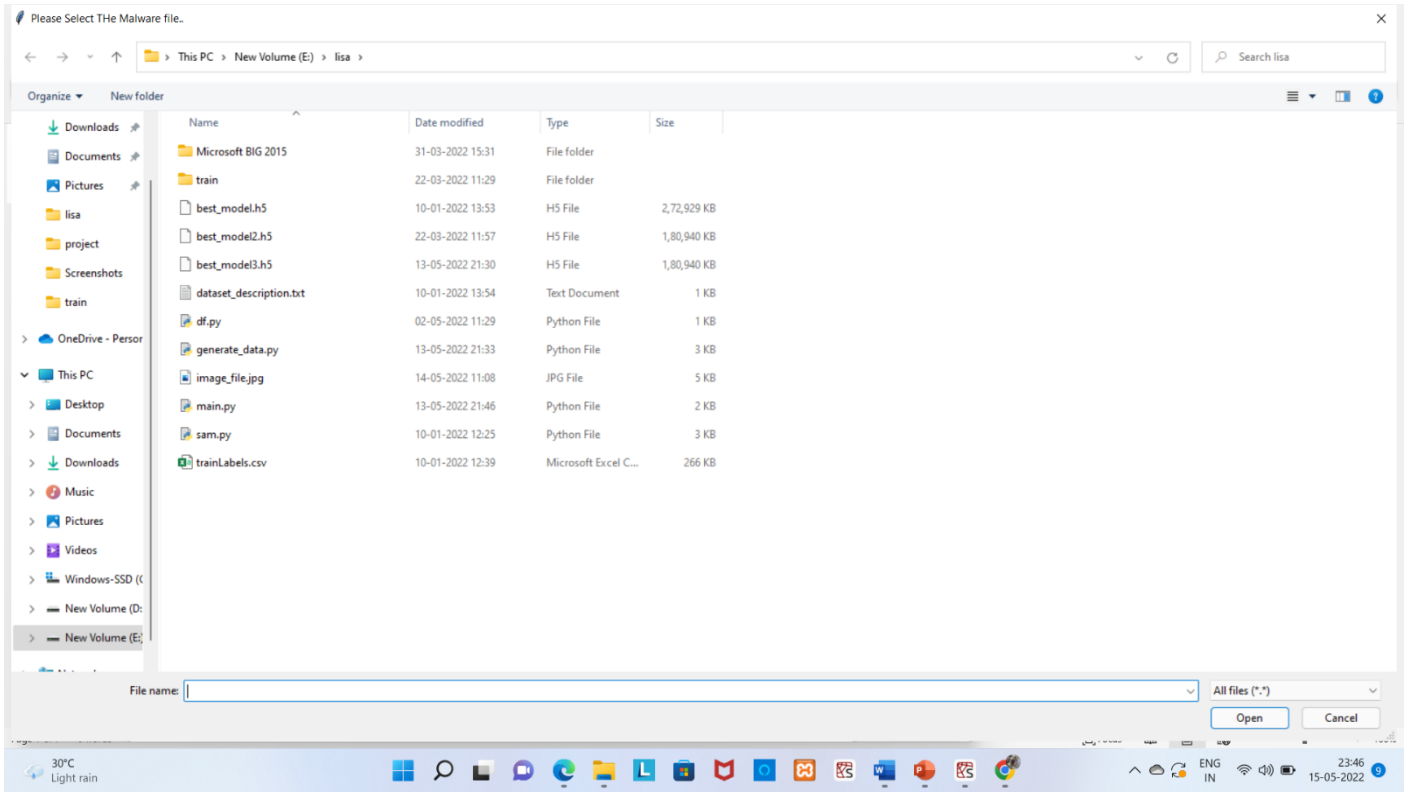
```
    w = 100 #width of image
    #be careful with using this function, it will consume memory, access to disk and time
    images = []
    #path = 'train/0BEsCP7NAUy8XmkenHWG.asm'
    with open(path, 'rb') as img_set:
        img_arr = img_set.read(h*w)
        img_arr2 = img_set.read()
        while img_arr:
            if len(img_arr) == h*w :
                images.append(img_arr)
            img_arr = img_set.read(h*w)
    #And you can save them into png files
    count = 0
    for img in images:
        png = Image.fromarray(np.reshape(list(img), (h,w)).astype('float32'), mode='L')
        png.save('image_file.jpg')
        count += 1
    arr=cv2.imread('image_file.jpg',0)
    return arr
X=[]
Y=[]
files=os.listdir('train')
data=pd.read_csv('trainLabels.csv')
l=len(data)
k=0
for asm_f in files:
```

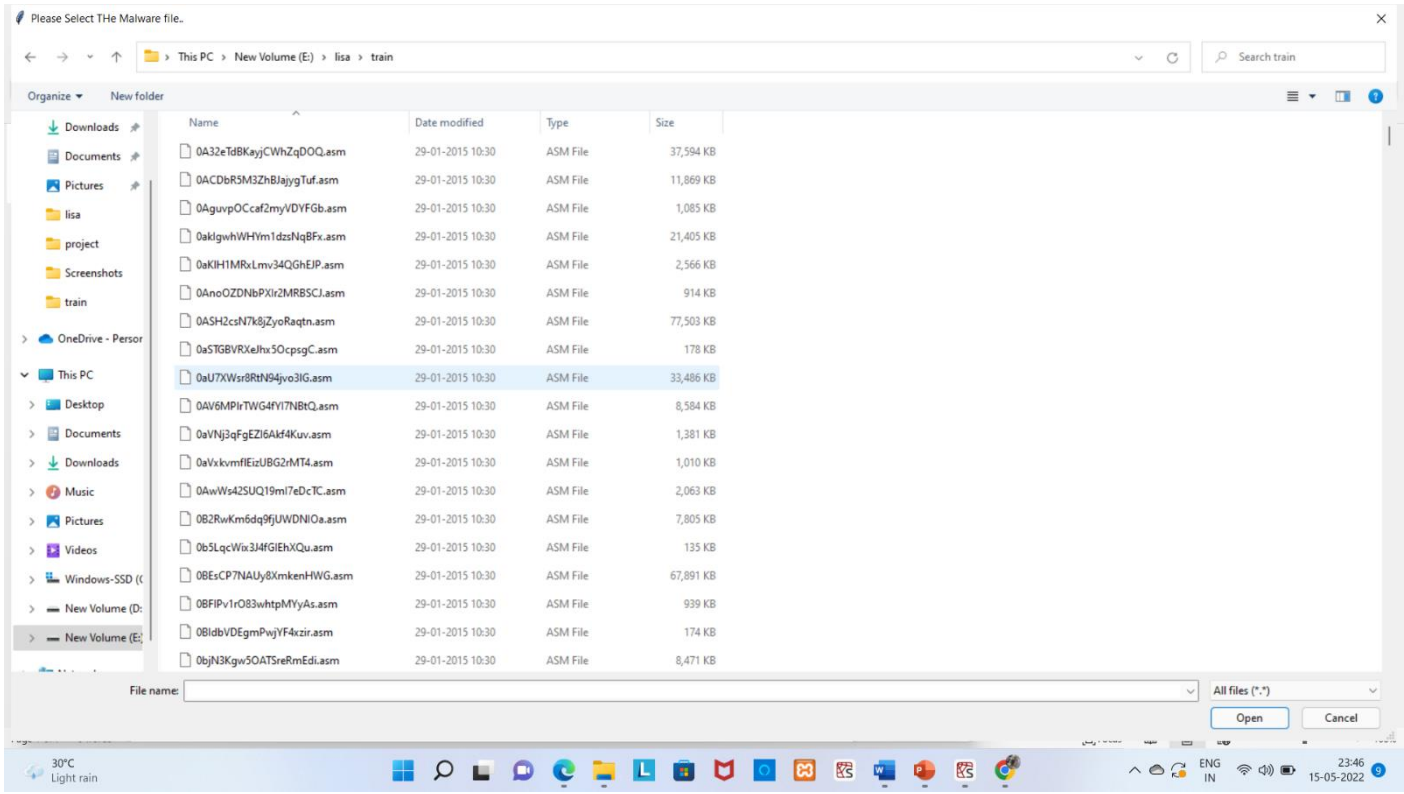
```
    asmfn=asm_f[:-4]
    c1=data[data['Id']==asmfn]
    target=c1.iloc[0,1]
    path=os.path.join('train',asm_f)
    arr=get_array(path)
    X.append(arr)
    Y.append(target)
Xd=np.array(X)
Yd=np.array(Y)
ys=pd.Series(Y)
yc=pd.get_dummies(ys)
ya=np.array(yc)
Xd=Xd.reshape(Xd.shape[0],Xd.shape[1],Xd.shape[2],1)
from sklearn.model_selection import train_test_split
xtrain,xtest,ytrain,ytest = train_test_split(Xd,ya, test_size=0.05)
new_input = Input(shape=(100, 100, 1))
model = MobileNetV2(include_top=False,weights=None, input_tensor=new_input,classes=9)
drop=Dropout(0.25)(model.layers[-1].output)
flat1 = Flatten()(drop)
class1 = Dense(512, activation='relu')(flat1)
drop=Dropout(0.25)(class1)
class1 = Dense(1024, activation='relu')(drop)
drop=Dropout(0.25)(class1)
class1 = Dense(2048, activation='relu')(drop)
output = Dense(9, activation='softmax')(class1)
model = Model(inputs=model.inputs, outputs=output)
```

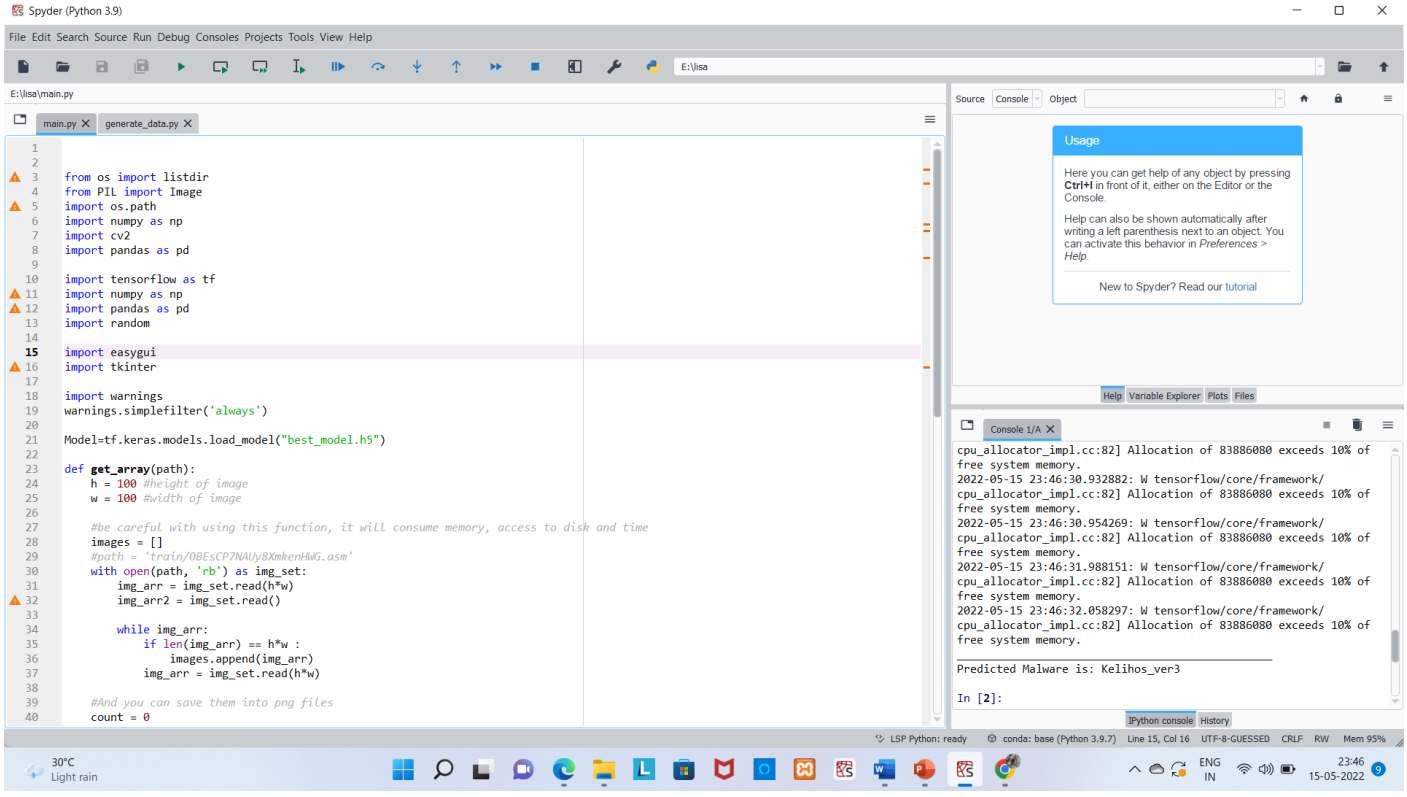
```
model.compile(optimizer='Adam',
              loss='categorical_crossentropy',
              metrics=['accuracy'])
my_call_back=[
   tf.keras.callbacks.EarlyStopping(monitor="accuracy",patience=20,restore_best_weights=True),
   tf.keras.callbacks.ModelCheck-
point(filepath="best_model3.h5",monitor='accuracy',mode="max",save_best_only=True)
   ]
model.fit(xtrain, ytrain,batch_size=1,epochs=10,validation_data=(xtest, ytest),callbacks=my_call_back)
```

SCREENSHOTS






Please Select THe Malware file..
This PC › New Volume (E:) › lisa › train
Search train
Organize
New folder
Downloads
Documents
Pictures
lisa
project
Screenshots
train
OneDrive - Persor
This PC
Desktop
Documents
Downloads
Music
Pictures
Videos
Windows-SSD ((
New Volume (D:
New Volume (E:
Name
Date modified
Type
Size
0A32eTdBKayjCWhZqDOQ.asm 29-01-2015 10:30 ASM File 37,594 KB
0ACDbR5M3ZhBJajygTuf.asm 29-01-2015 10:30 ASM File 11,869 KB
0AguvpOCcaf2myVDYFGb.asm 29-01-2015 10:30 ASM File 1,085 KB
0aklgwhWHYm1dzsNqBFx.asm 29-01-2015 10:30 ASM File 21,405 KB
0aKlH1MRxLmv34QGhEJP.asm 29-01-2015 10:30 ASM File 2,566 KB
0AnoOZDNbPXlr2MRBSCJ.asm 29-01-2015 10:30 ASM File 914 KB
0ASH2csN7k8jZyoRaqtn.asm 29-01-2015 10:30 ASM File 77,503 KB
0aSTGBVRXeJhx5OcpsgC.asm 29-01-2015 10:30 ASM File 178 KB
0aU7XWsr8RtN94jvo3IG.asm 29-01-2015 10:30 ASM File 33,486 KB
0AV6MPIrTWG4fYI7NBtQ.asm 29-01-2015 10:30 ASM File 8,584 KB
0aVNj3qFgEZI6Akf4Kuv.asm 29-01-2015 10:30 ASM File 1,381 KB
0aVxkvmfIEizUBG2rMT4.asm 29-01-2015 10:30 ASM File 1,010 KB
0AwWs42SUQ19mI7eDcTC.asm 29-01-2015 10:30 ASM File 2,063 KB
0B2RwKm6dq9fjUWDNlOa.asm 29-01-2015 10:30 ASM File 7,805 KB
0b5LqcWix3J4fGIEhXQu.asm 29-01-2015 10:30 ASM File 135 KB
0BEsCP7NAUy8XmkenHWG.asm 29-01-2015 10:30 ASM File 67,891 KB
0BFIPv1rO83whtpMYyAs.asm 29-01-2015 10:30 ASM File 939 KB
0BldbVDEgmPwjYF4xzir.asm 29-01-2015 10:30 ASM File 174 KB
0bjN3Kgw5OATSreRmEdi.asm 29-01-2015 10:30 ASM File 8,471 KB
File name:
All files (*.*)
Open
Cancel
30°C
Light rain
ENG
IN
23:46
15-05-2022


Spyder (Python 3.9)
File Edit Search Source Run Debug Consoles Projects Tools View Help
E:\lisa
E:\lisa\main.py
main.py
generate_data.py
from os import listdir
from PIL import Image
import os.path
import numpy as np
import cv2
import pandas as pd
import tensorflow as tf
import numpy as np
import pandas as pd
import random
import easygui
import tkinter
import warnings
warnings.simplefilter('always')
Model=tf.keras.models.load_model("best_model.h5")
def get_array(path):
h = 100 #height of image
w = 100 #width of image
#be careful with using this function, it will consume memory, access to disk and time
images = []
#path = 'train/0BEsCP7NAUy8XmkenHWG.asm'
with open(path, 'rb') as img_set:
img_arr = img_set.read(h*w)
img_arr2 = img_set.read()
while img_arr:
if len(img_arr) == h*w :
images.append(img_arr)
img_arr = img_set.read(h*w)
#And you can save them into png files
count = 0
Source
Console
Object
Usage
Here you can get help of any object by pressing Ctrl+I in front of it, either on the Editor or the Console.
Help can also be shown automatically after writing a left parenthesis next to an object. You can activate this behavior in Preferences > Help.
New to Spyder? Read our tutorial
Help
Variable Explorer
Plots
Files
Console 1/A
cpu_allocator_impl.cc:82] Allocation of 83886080 exceeds 10% of free system memory.
2022-05-15 23:46:30.932882: W tensorflow/core/framework/cpu_allocator_impl.cc:82] Allocation of 83886080 exceeds 10% of free system memory.
2022-05-15 23:46:30.954269: W tensorflow/core/framework/cpu_allocator_impl.cc:82] Allocation of 83886080 exceeds 10% of free system memory.
2022-05-15 23:46:31.988151: W tensorflow/core/framework/cpu_allocator_impl.cc:82] Allocation of 83886080 exceeds 10% of free system memory.
2022-05-15 23:46:32.058297: W tensorflow/core/framework/cpu_allocator_impl.cc:82] Allocation of 83886080 exceeds 10% of free system memory.
Predicted Malware is: Kelihos_ver3
In [2]:
IPython console
History
LSP Python: ready
conda: base (Python 3.9.7)
Line 15, Col 16
UTF-8-GUESSED
CRLF
RW
Mem 95%
30°C
Light rain
ENG
IN
23:46
15-05-2022

CONCLUSION

The project will investigate the identification of malware by examining different machine learning models, deep learning models. With deep learning based algorithms like CNN, DNN, RNN, and machine learning based approaches have been used to detect the malware and to classify the malware family. It is concluded that the system works well and satisfies all the end-users. The proposed system is tested very well and errors are properly debugged. This system is user-friendly so everyone can use it easily. The end-user can easily understand how the whole system is implemented by going through the documentation. The system is tested, implemented and the performance is found to be satisfactory. All necessary output is generated. Thus the project is completed successfully.

FUTURE ENHANCEMENT

Though we ought to have a successfully project, it could be still be improved further, according to some specific needs.

- This system can be improved as a malware detection system that detects and categorizes the obscure malware using hybrid methodology to achieve high performance results and to increase the accuracy score.
- We can include more categories of malware to be detected with more accuracy.
- This can be made more accurate with adding more data set.
- More algorithms with better performance can add on to accuracy.
- It can hosted on web for real time analysis of exe files on the cloud.

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3. https://www.kaggle.com/learn/intro-to-deep-learning/
4. https://www.mathworks.com/discovery/deep-learning.html#:~:text=Deep%20learning%20is%20a%20machine,a%20pedestrian%20from%20a%20lamppost.
5. https://www.ibm.com/cloud/learn/deep-learning
6. https://machinelearningmastery.com/what-is-deep-learning/
7. https://www.simplilearn.com/tutorials/deep-learning-tutorial/what-is-deep-learning

REMOTE PATIENT MONITORING

A project submitted to

ST.MARY'S COLLEGE (AUTONOMOUS), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY,

TIRUNELVELI

In partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

K.MAHESWARI

Reg. No.:20SPCS11

Under the Supervision and Guidance of

Ms.A.JENITTA JEBAMALAR M.Sc (IT)., M.Sc (CS)., M.Phil., B.Ed.

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi-628001

MAY 2022

CERTIFICATE

This is to certify that this project work entitled "**REMOTE PATIENT MONITORING**" is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to Manonmaniam Sundaranar University, Tirunelveli**,** in partial fulfillment for the award of the degree of Master of Science in Computer Science for the work done during the year 2021-2022 by **MAHESWARI .K (Reg. No.: 20SPCS11)**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do here by declare that, the project entitled "**REMOTE PATIENT MONITORING**" submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Ms. A. Jenitta Jebamalar M.Sc (IT)., M.Sc (CS)., M.Phil., B.Ed,** Assistant Professor, PG Department of Computer Science (SSC), St. Mary's College(Autonomous), Thoothukudi.

Station: Thoothukudi **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani , Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and Coordinator, PG Department of Computer Science (SSC) for her support and counsel.

I express my hearty thanks to my guide Ms. A. Jenitta Jebamalar M.Sc. (IT)., M.Sc. (CS)., M.Phil., B.Ed., , Assistant Professor, PG Department of Computer Science (SSC) for her Valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC) for her encouragement and support.

I am much indebted to Mr. C.Saravanan Chandra Krishnan CEO, TekSpear Solutions, for his untiring effort, immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

ABSTRACT

Remote Patient Monitoring (RPM) is a module in Remote Care Project which enables monitoring of patients outside of conventional call settings such as home or remote area which may increase access to care and decrease the healthcare delivery cost. The main goal of the RPM is used to reach patients in rural areas and connect patients to specialists and it also serves as a great way to reduce appointment breaches. 'Remote Patient Monitoring' consists of menus such as RPM summary, Taskboard, Onboarding request and reading analysis. The list of patients created will be displayed in RPM summary. The Insurance for the patient will also be created.

Onboarding Request menu consists of details of the patients and the care manager allots/assign the device based on the problems of the patients. This process will undergo DON review, Provider review and if the above factors are valid, the device gets processed and at last it stores in Inprogress.After the device has been assigned to the patient, the readings and medication details will be displayed at RCS IOT application. The Taskboard man show and displays the details such that which device is assign for patients and also displays the medication details of the patient. Reading analysis menu displays the reading of the patient for a particular period of time such as week/month etc. Thus, the RPM provides improved quality care for patients who are at rural areas.

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INTRODUCTION

Intelligent Healthcare Delivered from the Cloud

The patient care journey is traditionally a fragmented one, especially for more complex cases or chronic conditions that involve multiple healthcare providers and clinical specialists. As a result, a patient's critical health data may be stored and soloed across disparate IT systems or in outdated pen-and-paper systems.

RemoteCares was founded to solve this challenge. RemoteCares is transforming the healthcare space with its unified platform for health management, which collects and consolidates data from clinical management systems, medical devices, and patients in real time into a single view and protects it with modern encryption standards. It also provides intelligent healthcare, with built-in risk stratification tools, care plan templates, continuous monitoring of vitals, smart algorithms, and data analytics.

Real-Time Remote Consultation with Telehealth

One of the headline features of RemoteCares is its telehealth platform, a highly popular video-conferencing solution that connects healthcare providers with patients to offer remote consultations—whether in one-on-one sessions or in conferences of up to 100 people.

Preventive services

Preventive care is care you receive to prevent illness, detect medical conditions, and keep you healthy. Medicare Part B covers many preventive services, such as screenings, vaccines, and counseling. RemoteCare's intuitive platform is a one-stop wellness program built to help practices get compliant, patients get the most out of proactive care, and practitioners get time back in their days to focus on connecting and providing excellent care. It's HIPAA compliant and covers more facets of Medicare preventive care than any other platform.

Our most popular software solutions allow practices to effectively manage these Medicare programs in their office with their staff. We'll provide the tools and training. You provide the clinical resources. Medicare Programs supported through our platform include:

- Chronic Care Management
- Remote Patient Monitoring
- Annual Wellness Visits

SYSTEM SPECIFICATION

HARDWARE REQUIREMENTS:

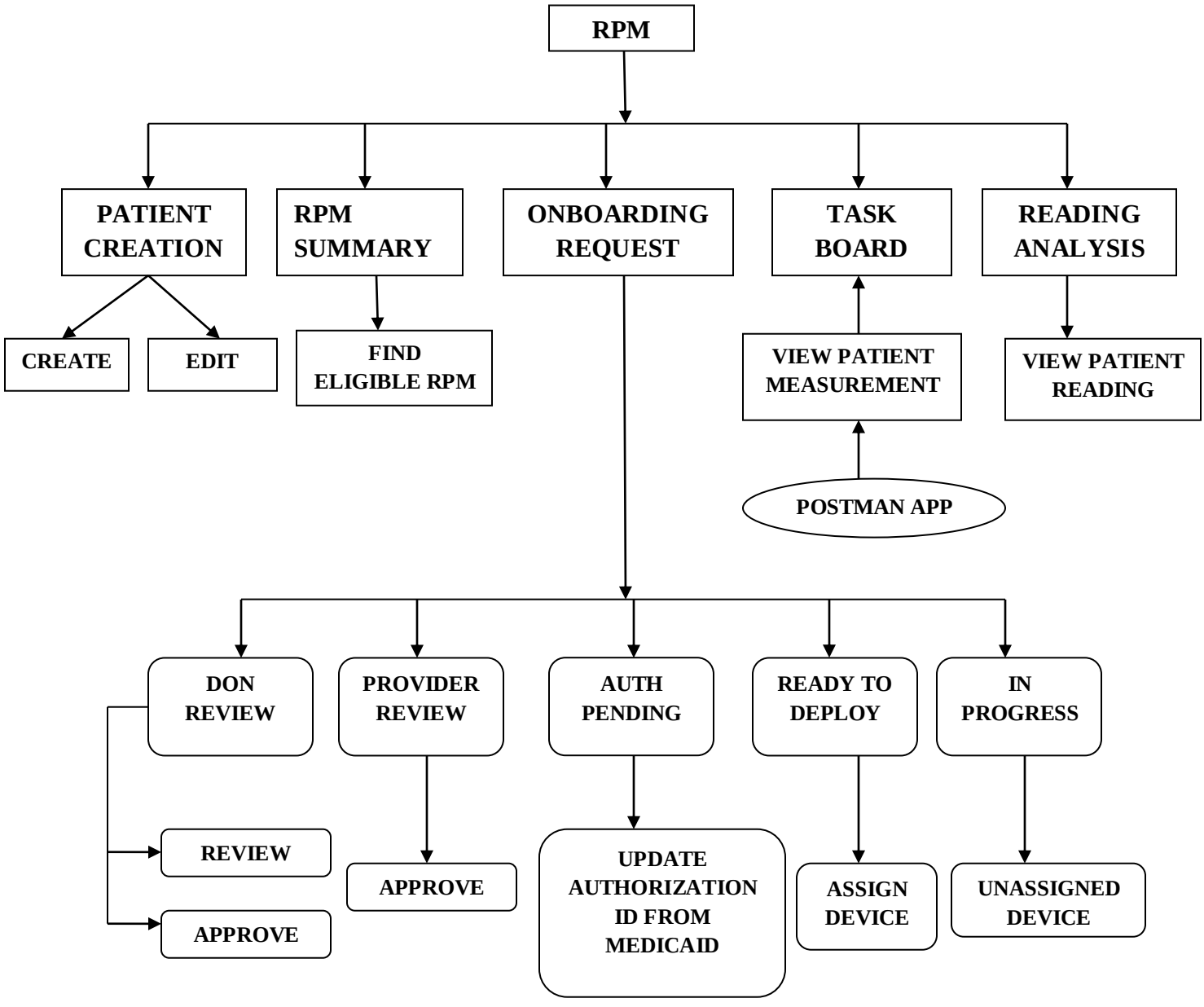
Frontend Tools	:	Visual studio 2019
Backend Tools	:	Microsoft SQL Server Management Studio
Web API	:	Rest API
Platform	:	Windows

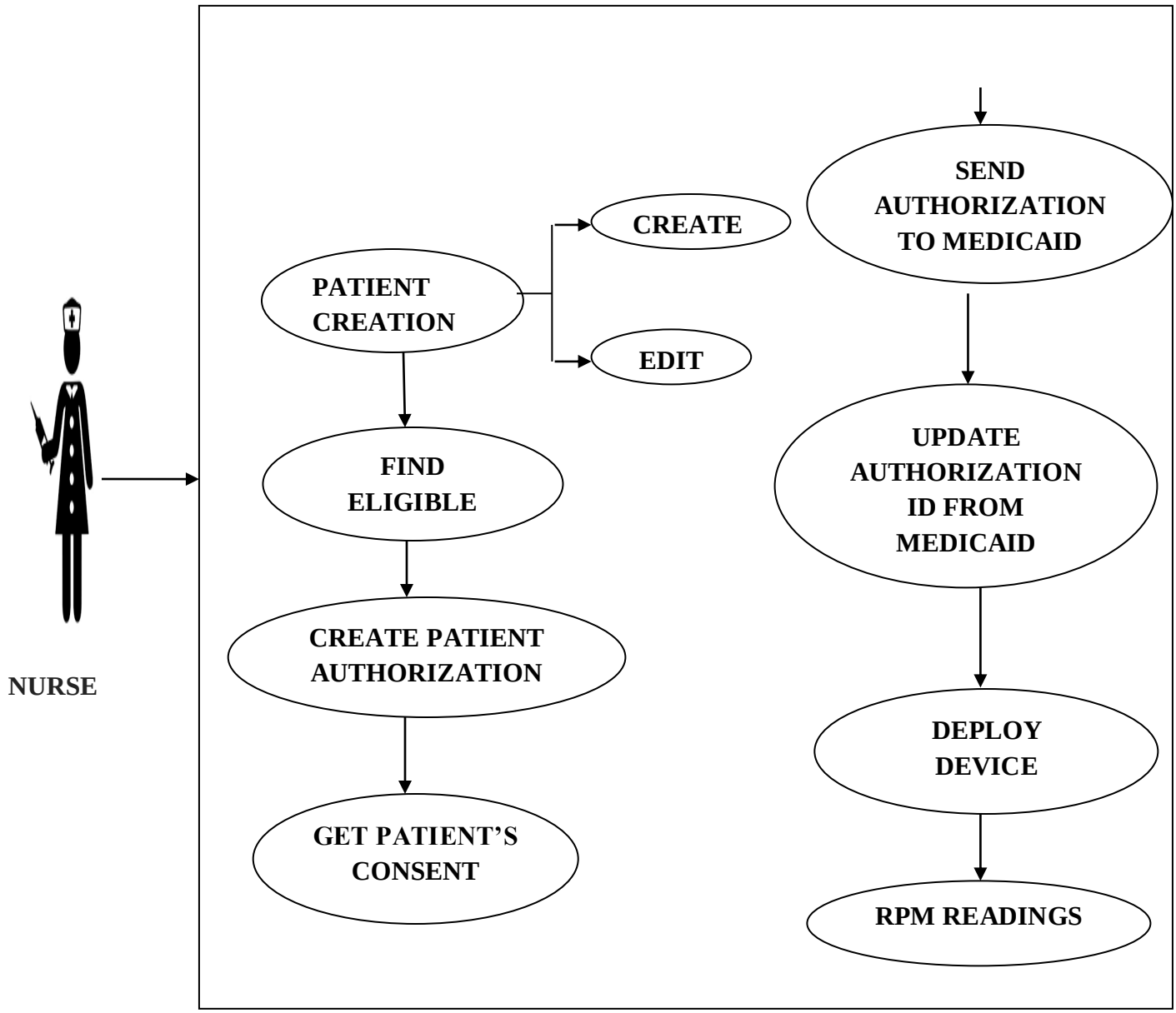
SOFTWARE REQUIREMENTS:

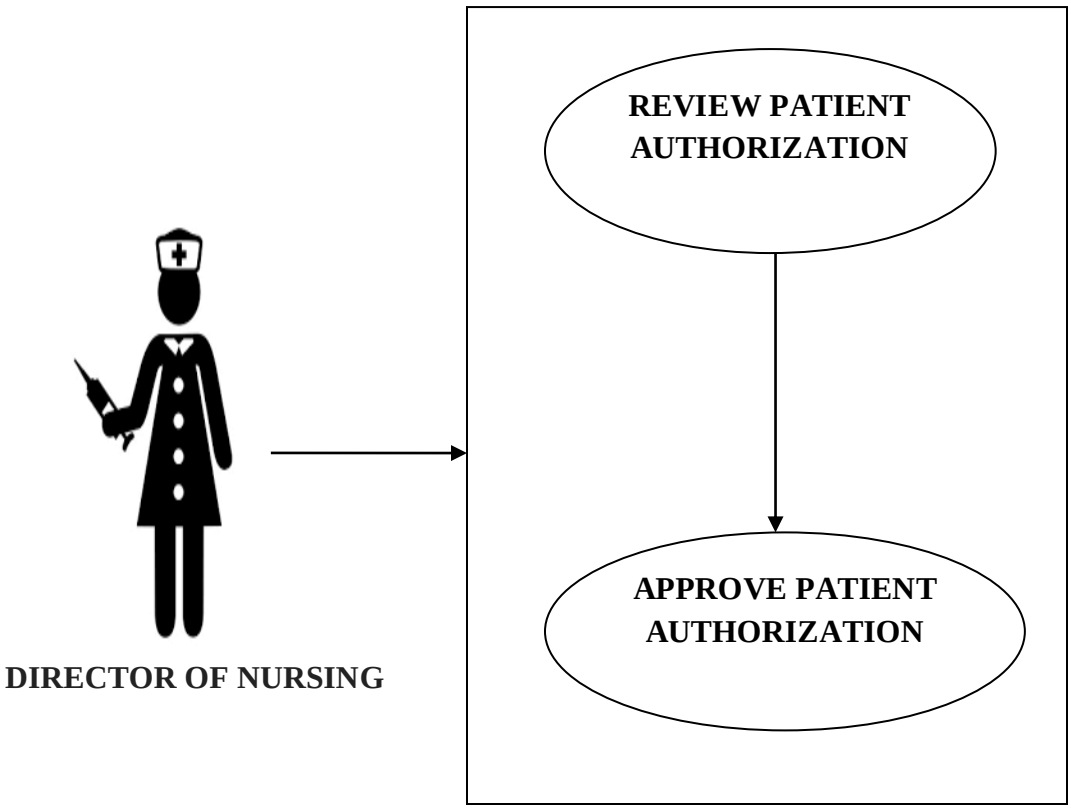
Operating System	:	Window 10
Application Front-end Tools:		UI
Database Back-end Tools	:	Entity Framework Core

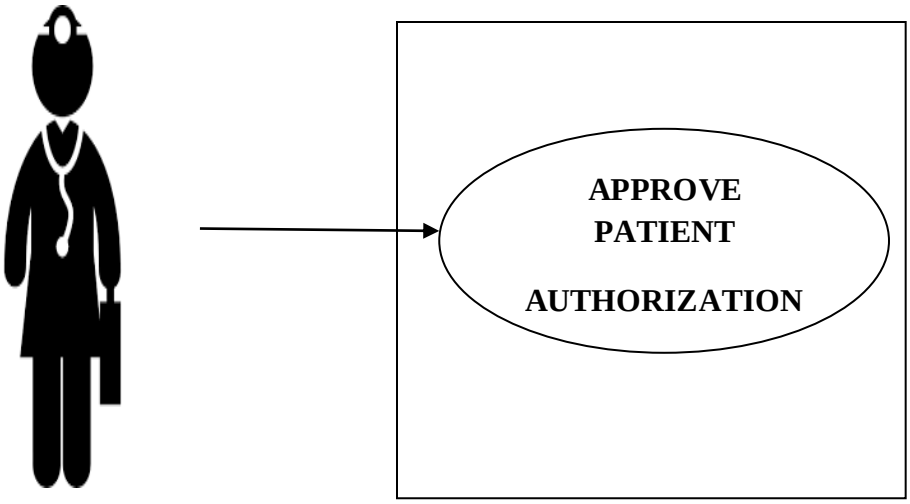
SYSTEM DESIGN

ENTITY RELATIONSHIP DIAGRAM




NURSE
PATIENT CREATION
CREATE
EDIT
FIND ELIGIBLE
CREATE PATIENT AUTHORIZATION
GET PATIENT'S CONSENT
SEND AUTHORIZATION TO MEDICAID
UPDATE AUTHORIZATION ID FROM MEDICAID
DEPLOY DEVICE
RPM READINGS


REVIEW PATIENT AUTHORIZATION
APPROVE PATIENT AUTHORIZATION
DIRECTOR OF NURSING


APPROVE PATIENT
AUTHORIZATION

PROJECT DESCRIPTION

The project entitled “Remote Patient Monitoring” has the following modules.

- ✓ Patient Creation
- ✓ Manage Patient Consent
- ✓ RPM

CREATION OF PATIENTS:

Patient information can be found by clicking the **“Patient”** link in the navigation menu. From The main “Patient” page users are able to access patient summaries, create new patients, edit existing patients, bulk import patients. To create a new patient, users will find the blue “New Patient” button at the upper right of the “Patients” page. This will launch the “Create New Patient” wizard. Users will go through all three tabs (Patient Information, Contact Information, Insurances) entering the appropriate information to establish the patient. A red dot (.) denotes information that is required in order to advance through the wizard. The more information that is provided in these steps, the more accurate the eligibility and billion recommendations will be.

After providing the patient information, the problems and procedures will be asked. The common problems include Diabetes, Hypertension, COPD and CHF. This will require the problems faced by the patients. Procedures include medical equipment used by the patients. These details were given for more understanding about the patient.

Then, the details of the Care Team, Related parties, Related Providers and Pharmacies were entered. In the Care team menu, the name of the Enterprise, Provider and Care Manager were given. The Related Parties menu includes the details of the parties, Related Providers includes the details of the providers and the Pharmacies include the details of the pharmacy store etc. Within the “Insurances" tab, users should be sure to enter all medical insurance policies that the patient has. This will prompt a screen requesting identifying information about the insurance policy.It is important that users click the blue “Update” button at the bottom right of the wizard. Insurance policies can be added until all of the patient’s information is in the system. When finished, users will click the blue **“Save”** button in the bottom right of the wizard to finalize the creation of the new patient.

MANAGE PATIENT CONSENT:

In Manage Patient Consent, the consent of the patient will be provided. The consent may be in verbal, E-Sign etc..

REMOTE PATIENT MONITORING:

The RPM module consists of

- RPM Summary
- Taskboard
- Onboarding Request
- Reading Analysis

RPM SUMMARY:

RPM Summary displays the name of the patient created in RPM with their devices assigned for the devices based on the problems by the onboarding request.

TASKBOARD:

In the postman application we will provide the name and ID of the device and also we will provide the current time and then click “send”.

Then the task board menu in RPM shows the reading and medication details of the patient which was measured by the devices assigned for the patient.

It also display the reading of the patient in chart format

ONBOARDING REQUEST:

Onboarding Request consists of a menu called Don to Review,Provider Review,Auth Pending,Ready to Deploy and Inprogress.

DON REVIEW:

It consists of Authorization info and normal ranges.In Authorization info,the name of the Home Health Nurse and any two risk factors should be given .

In normal ranges the medication details will be monitored.

PROVIDER REVIEW:

In Provider Review the provider simply checks the details done by the Don Review and then he confirms it by saving.

AUTH PENDING:

It consists of managed authorization which enables us to enter the authorization status may be queued,Pending,Inactive,Valid.

READY TO DEPLOY:

In Ready to Deploy Menu, the list of devices will be entered by providing the device type after entering the above details Inprogress menu.

INPROGRESS:

This menu displays the details of the devices assigned to the patient.

PATIENT REPORT:

Then, the report of the patient will be generated and the report will be stored and can be displayed in the patient's record.

READING ANALYSIS:

It shows the reading of the patient taken by the devices based on the date and time.

DATABASE DESCRIPTION

Patient-Table

ColumnName	DataType	AllowNull
Oid	Uniqueidentifier	UnChecked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
PlannedDate	Datetime	Checked
HealthRiskAssessment	Uniqueidentifier	Checked
Vitals	Uniqueidentifier	Checked
SkipVitals	Bit	Checked
AWVStatus	Int	Checked
HRAStatus	Int	Checked
EmailSentOn	Datetime	Checked
HRACompletedOn	Datetime	Checked
ClinicalIntakeOn	Datetime	Checked
ProviderReviewedOn	Datetime	Checked
VitalsReviewed	Datetime	Checked
AllergiesReviewed	Datetime	Checked
MedicationsReviewed	Datetime	Checked
ProblemsReviewed	Datetime	Checked
RelatedProvidersReviewed	Datetime	Checked
FamilyHistoryReviewed	Datetime	Checked
PastSurgeriesReviewed	Datetime	Checked
HospitalizationsReviewed	Datetime	Checked
BalanceTestReviewed	Datetime	Checked
CognitiveTestReviewed	Datetime	Checked
PreventiveScreeningReviewed	Datetime	Checked
TUGTestDuration	Int	Checked
TUGTestNotes	nvarchar(1000)	Checked
WordSetIndex	Int	Checked
Word1Correct	Bit	Checked
Word2Correct	Bit	Checked
Word3Correct	Bit	Checked
CanDrawClock	Bit	Checked
ChartIntakeStepId	numeric(10,0)	Checked
TotalSteps	numeric(10,0)	Checked

ProviderReviewStepId	numeric(10,0)	Checked
ProviderReviewTotalSteps	numeric(10,0)	Checked
VisitType	Int	Checked

Vitals-Table

ColumnName	DataType	AllowNull
Oid	Uniqueidentifier	Unchecked
Template	Uniqueidentifier	Checked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
Systolic	Int	Checked
Diastolic	Int	Checked
SystolicSupine	Int	Checked
DiastolicSupine	Int	Checked
SystolicSitting	Int	Checked
DiastolicSitting	Int	Checked
SystolicStanding	Int	Checked
DiastolicStanding	Int	Checked
Temp	Float	Checked
HR	Int	Checked
Respiration	Int	Checked
O2	Float	Checked
O2Classification	Int	Checked
HeightMeters	Float	Checked
WeightKg	Float	Checked
HeadCircumference	Float	Checked
OD	nvarchar(100)	Checked
OS	nvarchar(100)	Checked
OU	nvarchar(100)	Checked
CorrectionType	Int	Checked
AD	Int	Checked
[AS]	Int	Checked
LMP	Datetime	Checked
BMI	Float	Checked
PainScale	Int	Checked
BodyFat	Float	Checked
WaistMeters	Float	Checked
HipsMeters	Float	Checked

BloodGlucose	Float	Checked
Pulse	Float	Checked
PI	Float	Checked
ActivityMovement	numeric(10,0)	Checked
FEV1	Float	Checked
FVC	Float	Checked

Allergy-Table

ColumnName	DataType	AllowNull
Oid	Uniqueidentifier	UnChecked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
ReactionType	Int	Checked
MedicalHistory	Uniqueidentifier	Checked
Category	Uniqueidentifier	Checked
Type	Uniqueidentifier	Checked
Severity	Uniqueidentifier	Checked
AllergyStatus	Int	Checked
ReactionDescription	nvarchar(200)	Checked
Onset	Datetime	Checked
DoseSpotID	Int	Checked
Drug	Uniqueidentifier	Checked
ScriptSureID	numeric(10,0)	Checked

Medications-Table

ColumnName	DataType	AllowNull
Oid	Uniqueidentifier	Unchecked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
Category	Uniqueidentifier	Checked
Drug	Uniqueidentifier	Checked
Name	nvarchar(500)	Checked
MedicationStatus	Int	Checked
Source	Int	Checked
MedicalHistory	Uniqueidentifier	Checked
InfoProvidedToPatient	Bit	Checked

Started	datetime	Checked
Stopped	datetime	Checked
PrescriptionStatus	int	Checked
NoteToPharmacy	nvarchar(210)	Checked
RefillsAsNeeded	bit	Checked
RefillQuantity	numeric(5,0)	Checked
GenericsOK	bit	Checked
FormularyChecked	bit	Checked
WrittenDate	datetime	Checked
Pharmacy	uniqueidentifier	Checked
Quantity	nvarchar(16)	Checked
LastFilled	datetime	Checked
Frequency	uniqueidentifier	Checked
Dispense	nvarchar(16)	Checked
DispenseUnit	nvarchar(100)	Checked
DaysSupply	numeric(5,0)	Checked
PatientInstructions	nvarchar(400)	Checked
PharmacyNotes	nvarchar(210)	Checked
PrescibedBy	uniqueidentifier	Checked
DoseSpotID	int	Checked
SureScriptsMessageId	nvarchar(100)	Checked
SubstitutionsOK	bit	Checked
QuantityInt	numeric(10,0)	Checked
[Order]	uniqueidentifier	Checked
ScriptSureID	numeric(10, 0)	Checked

Problems-Table

ColumnName	DataType	AllowNull
Oid	Uniqueidentifier	Unchecked
Patient	Uniqueidentifier	Checked
Encounter	Uniqueidentifier	Checked
ParentChartItem	Uniqueidentifier	Checked
Type	Uniqueidentifier	Checked
Source	nvarchar(100)	Checked
Category	Uniqueidentifier	Checked
MedicalHistory	Uniqueidentifier	Checked
ProblemStatus	Int	Checked

Immunizations-Table

ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
Type	uniqueidentifier	Checked
Route	Int	Checked
Site	Int	Checked
RouteOfAdministration	nvarchar(100)	Checked
AdministeredLocation	nvarchar(100)	Checked
Manufacturer	uniqueidentifier	Checked
StartOfAdministration	Datetime	Checked
EndOfAdministration	Datetime	Checked
AdministeredAmount	Float	Checked
AdministeredUnits	uniqueidentifier	Checked
LotNumber	nvarchar(100)	Checked
ExpirationDate	Datetime	Checked
ReportedToState	Bit	Checked
DateReportedToState	Datetime	Checked
VaccineDocumentRecipientNam	nvarchar(100)	Checked
VaccineDocumentDateProvide	Datetime	Checked
VfcEligibility	Int	Checked
AdministeredBy	uniqueidentifier	Checked
ImmunizationStatus	Int	Checked
RefusalReason	Int	Checked
ReasonDescription	nvarchar(100)	Checked
DiseaseImminuty	Bigint	Checked
Protected	Int	Checked

Past Surgery-Table

ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
PatientReportedNote	nvarchar(1000)	Checked
Date	datetime	Checked
MedicalHistory	uniqueidentifier	Checked

Hospitalization-Table

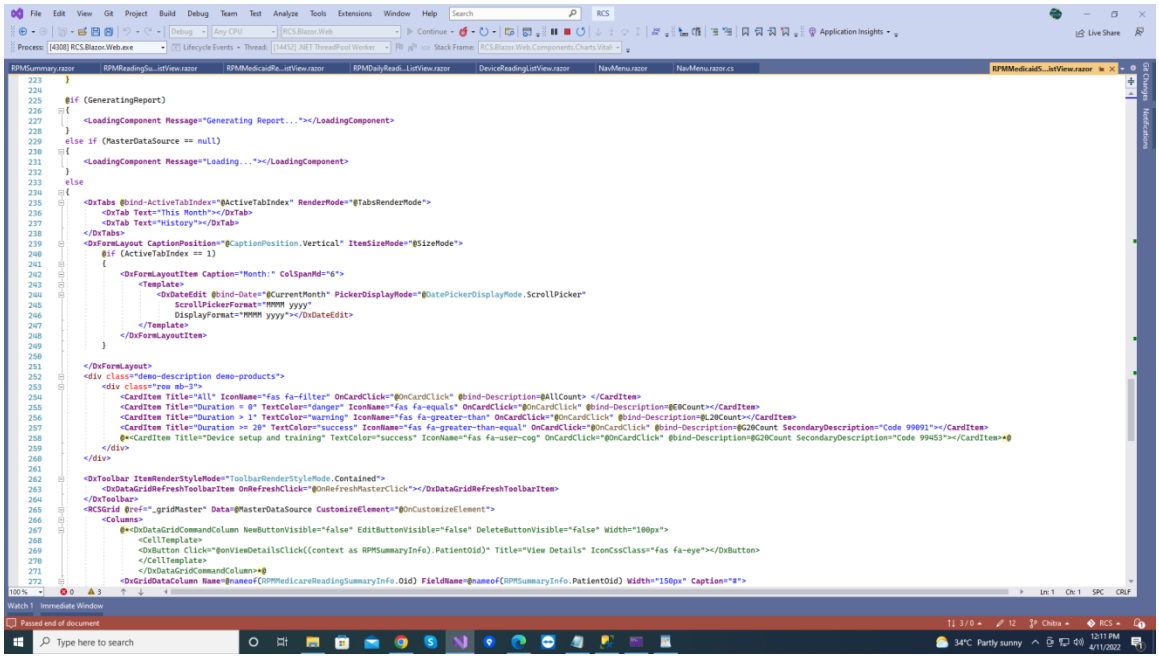
ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Patient	uniqueidentifier	Checked
Encounter	uniqueidentifier	Checked
ParentChartItem	uniqueidentifier	Checked
PatientReportedNote	nvarchar(100)	Checked
Date	datetime	Checked
Type	uniqueidentifier	Checked
Category	uniqueidentifier	Checked
MedicalHistory	uniqueidentifier	Checked

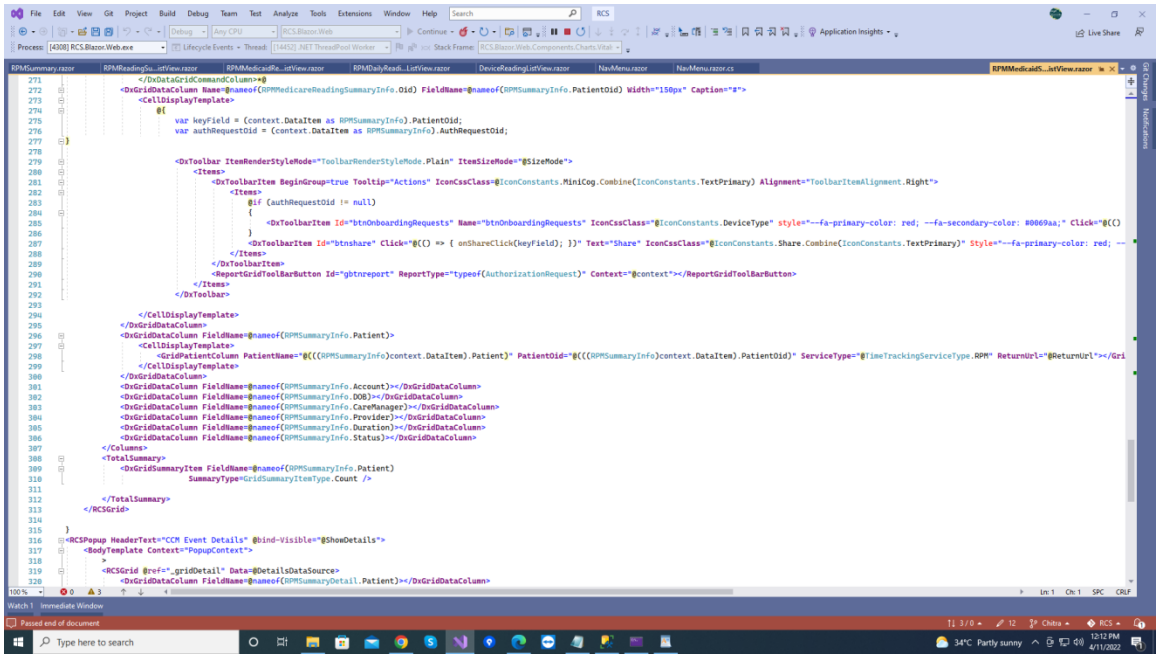
Preventive Screening-Table

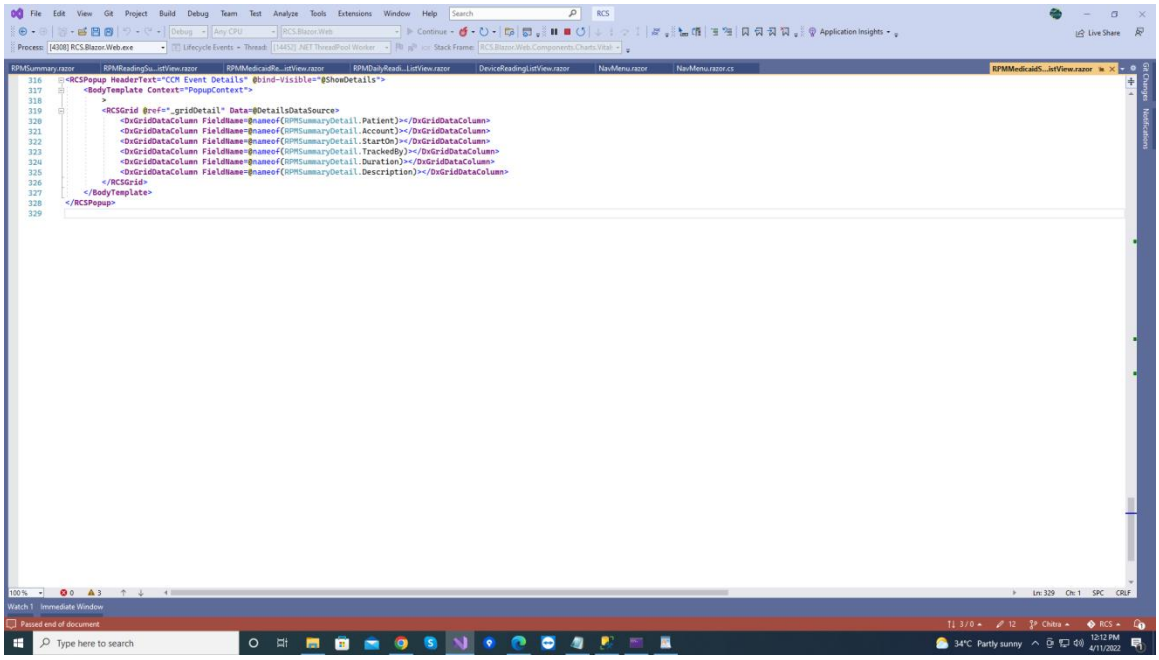
ColumnName	DataType	AllowNull
Oid	uniqueidentifier	Unchecked
Created	datetime	Checked
CreatedBy	uniqueidentifier	Checked
LastModified	datetime	Checked
ModifiedBy	uniqueidentifier	Checked
IsSynchronized	Bit	Checked
IsArchived	Bit	Checked
PreventiveScreeningType	uniqueidentifier	Checked
HealthRiskAssessment	uniqueidentifier	Checked
NeedScreening	Bit	Checked
LastCompleted	datetime	Checked
EligibilityFrom	datetime	Checked
Comments	nvarchar(100)	Checked
OptimisticLockField	Int	Checked
GCRecord	Int	Checked

CODE DESIGN

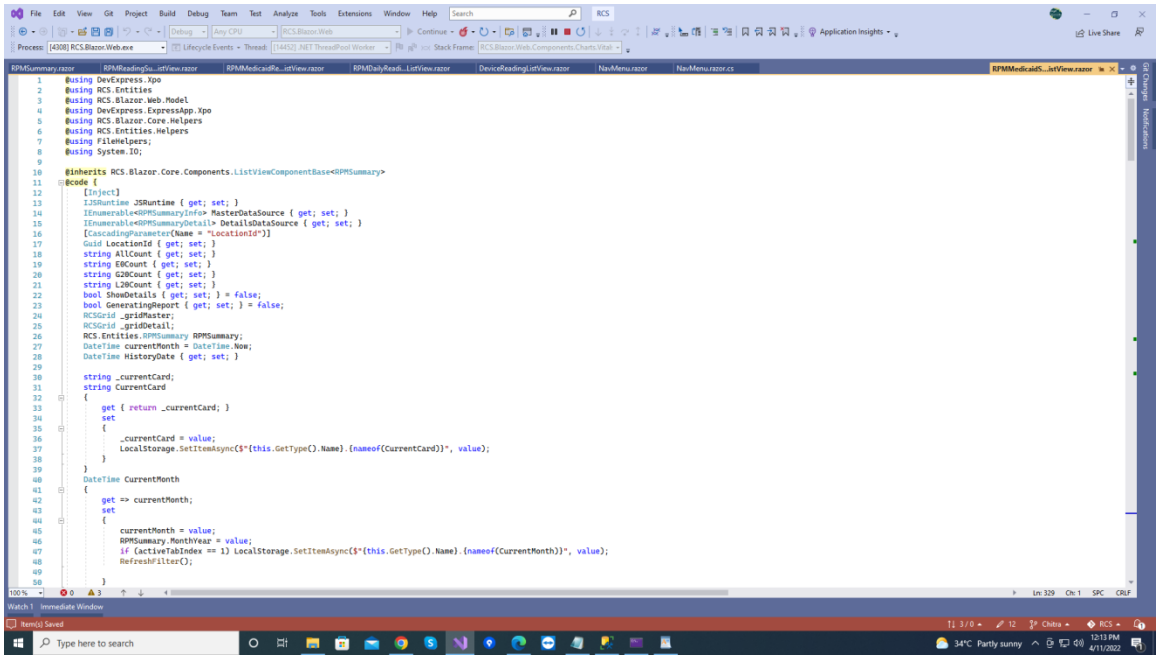
On Clicking RPM Summary :







```
<RCSPopup HeaderText="CCM Event Details" @bind-Visible="@ShowDetails">
    <BodyTemplate Context="PopupContext">
        >
        <RCSGrid @ref="_gridDetail" Data=@DetailsDataSource>
            <DxGridDataColumn FieldName=@nameof(RPMSummaryDetail.Patient)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(RPMSummaryDetail.Account)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(RPMSummaryDetail.StartOn)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(RPMSummaryDetail.TrackedBy)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(RPMSummaryDetail.Duration)></DxGridDataColumn>
            <DxGridDataColumn FieldName=@nameof(RPMSummaryDetail.Description)></DxGridDataColumn>
        </RCSGrid>
    </BodyTemplate>
</RCSPopup>
```

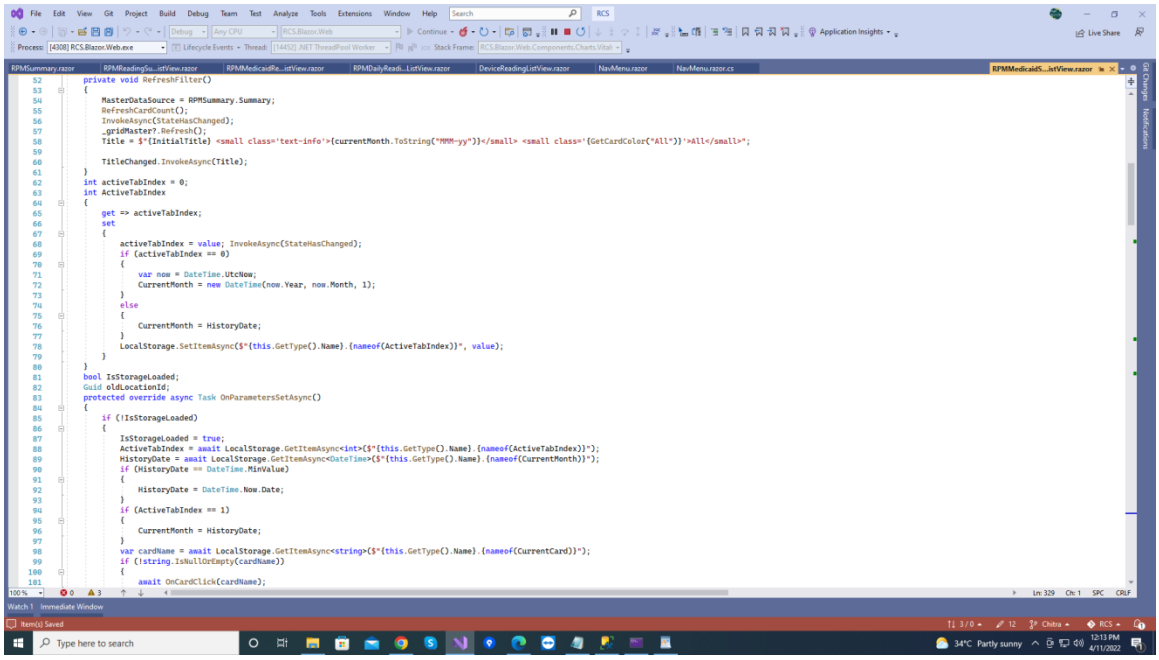


```
@using DevExpress.Xpo
@using RCS.Entities
@using RCS.Blazor.Web.Model
@using DevExpress.ExpressApp.Xpo
@using RCS.Blazor.Core.Helpers
@using RCS.Entities.Helpers
@using FileHelpers;
@using System.IO;

@inherits RCS.Blazor.Core.Components.ListViewComponentBase<RPMSummary>
@code {
    [Inject]
    IJSRuntime JSRuntime { get; set; }
    IEnumerable<RPMSummaryInfo> MasterDataSource { get; set; }
    IEnumerable<RPMSummaryDetail> DetailsDataSource { get; set; }
    [CascadingParameter(Name = "LocationId")]
    Guid LocationId { get; set; }
    string AllCount { get; set; }
    string E0Count { get; set; }
    string G20Count { get; set; }
    string L20Count { get; set; }
    bool ShowDetails { get; set; } = false;
    bool GeneratingReport { get; set; } = false;
    RCSGrid _gridMaster;
    RCSGrid _gridDetail;
    RCS.Entities.RPMSummary RPMSummary;
    DateTime currentMonth = DateTime.Now;
    DateTime HistoryDate { get; set; }

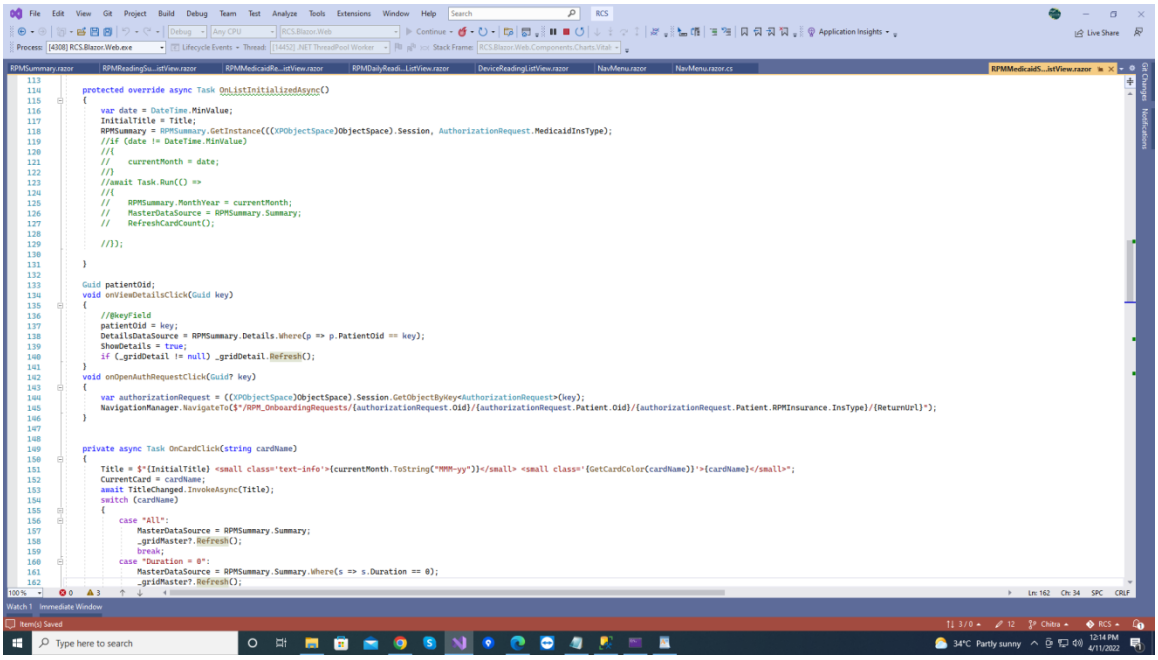
    string _currentCard;
    string CurrentCard
    {
        get { return _currentCard; }
        set
        {
            _currentCard = value;
            LocalStorage.SetItemAsync($"{this.GetType().Name}.{nameof(CurrentCard)}", value);
        }
    }
    DateTime CurrentMonth
    {
        get => currentMonth;
        set
        {
            currentMonth = value;
            RPMSummary.MonthYear = value;
            if (activeTabIndex == 1) LocalStorage.SetItemAsync($"{this.GetType().Name}.{nameof(CurrentMonth)}", value);
            RefreshFilter();

        }
```



```
private void RefreshFilter()
{
    MasterDataSource = RPMSummary.Summary;
    RefreshCardCount();
    InvokeAsync(StateHasChanged);
    _gridMaster?.Refresh();
    Title = $"{InitialTitle} <small class='text-info'>{currentMonth.ToString("MMM-yy")}</small> <small class='{GetCardColor("All")}'>All</small>";

    TitleChanged.InvokeAsync(Title);
}
int activeTabIndex = 0;
int ActiveTabIndex
{
    get => activeTabIndex;
    set
    {
        activeTabIndex = value; InvokeAsync(StateHasChanged);
        if (activeTabIndex == 0)
        {
            var now = DateTime.UtcNow;
            CurrentMonth = new DateTime(now.Year, now.Month, 1);
        }
        else
        {
            CurrentMonth = HistoryDate;
        }
        LocalStorage.SetItemAsync($"{this.GetType().Name}.{nameof(ActiveTabIndex)}", value);
    }
}
bool IsStorageLoaded;
Guid oldLocationId;
protected override async Task OnParametersSetAsync()
{
    if (!IsStorageLoaded)
    {
        IsStorageLoaded = true;
        ActiveTabIndex = await LocalStorage.GetItemAsync<int>($"{this.GetType().Name}.{nameof(ActiveTabIndex)}");
        HistoryDate = await LocalStorage.GetItemAsync<DateTime>($"{this.GetType().Name}.{nameof(CurrentMonth)}");
        if (HistoryDate == DateTime.MinValue)
        {
            HistoryDate = DateTime.Now.Date;
        }
        if (ActiveTabIndex == 1)
        {
            CurrentMonth = HistoryDate;
        }
        var cardName = await LocalStorage.GetItemAsync<string>($"{this.GetType().Name}.{nameof(CurrentCard)}");
        if (!string.IsNullOrEmpty(cardName))
        {
            await OnCardClick(cardName);
```



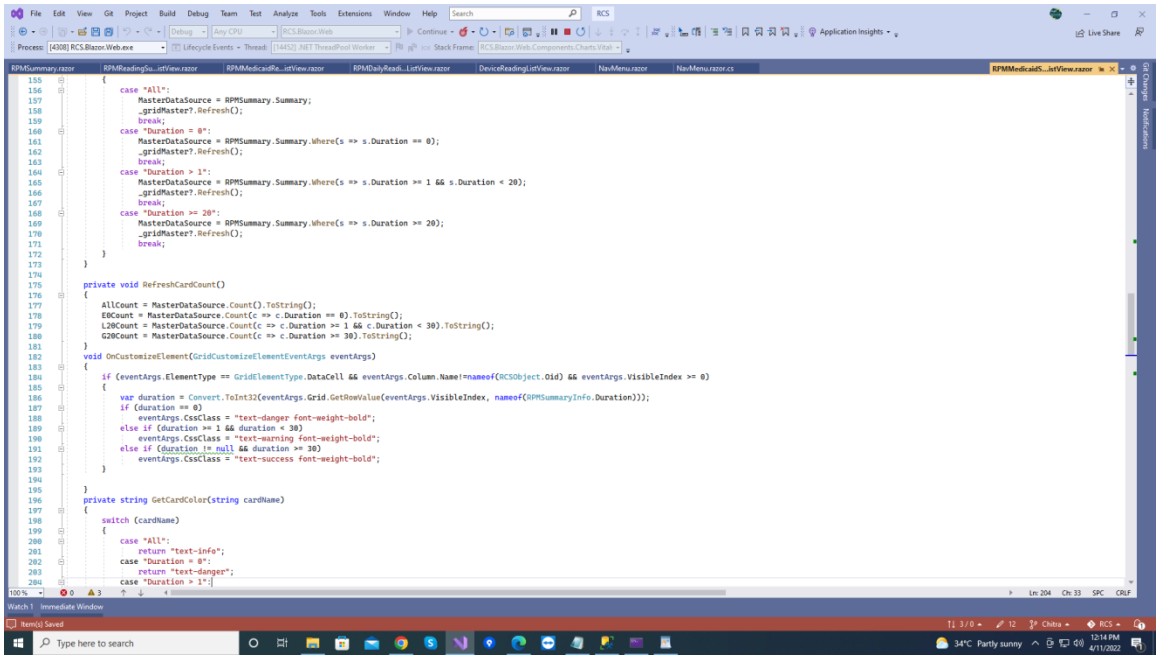
```
protected override async Task OnListInitializedAsync()
{
    var date = DateTime.MinValue;
    InitialTitle = Title;
    RPMSummary = RPMSummary.GetInstance(((XPObjectSpace)ObjectSpace).Session, AuthorizationRequest.MedicaidInsType);
    //if (date != DateTime.MinValue)
    //{
    //    currentMonth = date;
    //}
    //await Task.Run(() =>
    //{
    //    RPMSummary.MonthYear = currentMonth;
    //    MasterDataSource = RPMSummary.Summary;
    //    RefreshCardCount();

    //});

}

Guid patientOid;
void onViewDetailsClick(Guid key)
{
    //@keyField
    patientOid = key;
    DetailsDataSource = RPMSummary.Details.Where(p => p.PatientOid == key);
    ShowDetails = true;
    if (_gridDetail != null) _gridDetail.Refresh();
}
void onOpenAuthRequestClick(Guid? key)
{
    var authorizationRequest = ((XPObjectSpace)ObjectSpace).Session.GetObjectByKey<AuthorizationRequest>(key);
    NavigationManager.NavigateTo($"/RPM_OnboardingRequests/{authorizationRequest.Oid}/{authorizationRequest.Patient.Oid}/{authorizationRequest.Patient.RPMInsurance.InsType}/{ReturnUrl}");
}

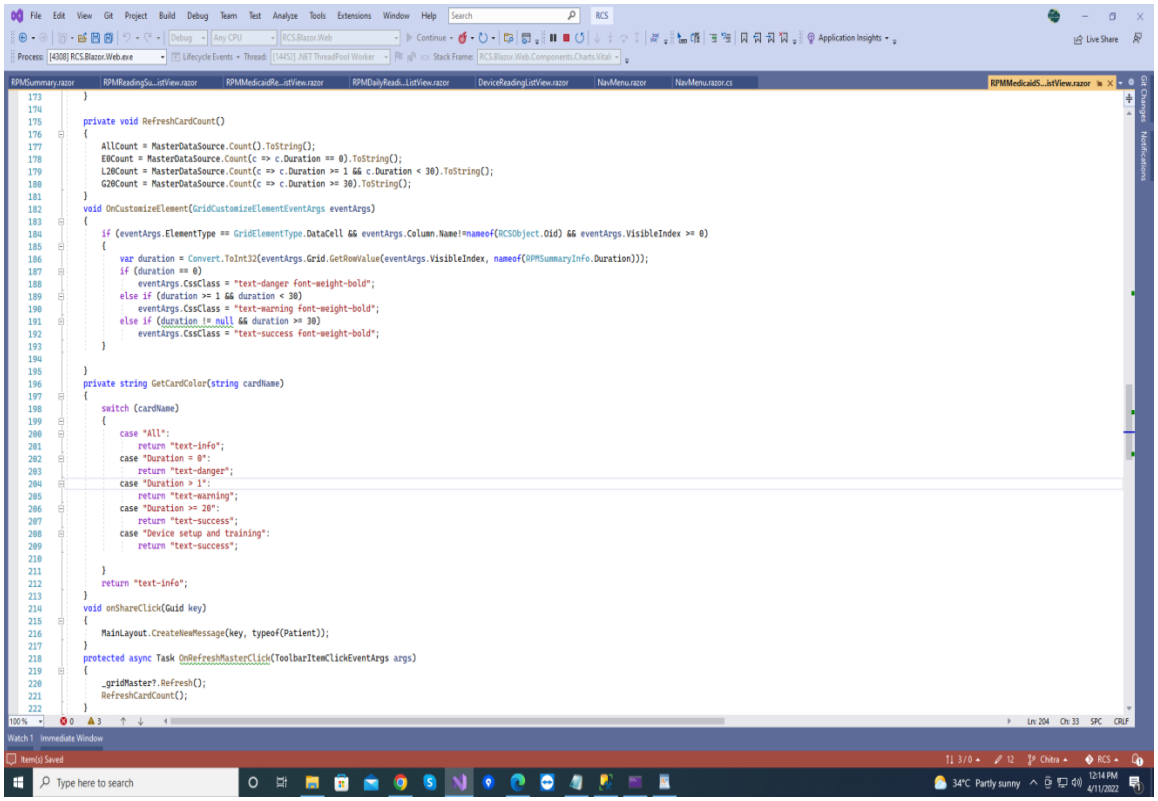

private async Task OnCardClick(string cardName)
{
    Title = $"{InitialTitle} <small class='text-info'>{currentMonth.ToString("MMM-yy")}</small> <small class='{GetCardColor(cardName)}'>{cardName}</small>";
    CurrentCard = cardName;
    await TitleChanged.InvokeAsync(Title);
    switch (cardName)
    {
        case "All":
            MasterDataSource = RPMSummary.Summary;
            _gridMaster?.Refresh();
            break;
        case "Duration = 0":
            MasterDataSource = RPMSummary.Summary.Where(s => s.Duration == 0);
            _gridMaster?.Refresh();
```



```
        {
            case "All":
                MasterDataSource = RPMSummary.Summary;
                _gridMaster?.Refresh();
                break;
            case "Duration = 0":
                MasterDataSource = RPMSummary.Summary.Where(s => s.Duration == 0);
                _gridMaster?.Refresh();
                break;
            case "Duration > 1":
                MasterDataSource = RPMSummary.Summary.Where(s => s.Duration >= 1 && s.Duration < 20);
                _gridMaster?.Refresh();
                break;
            case "Duration >= 20":
                MasterDataSource = RPMSummary.Summary.Where(s => s.Duration >= 20);
                _gridMaster?.Refresh();
                break;
        }
    }

    private void RefreshCardCount()
    {
        AllCount = MasterDataSource.Count().ToString();
        E0Count = MasterDataSource.Count(c => c.Duration == 0).ToString();
        L20Count = MasterDataSource.Count(c => c.Duration >= 1 && c.Duration < 30).ToString();
        G20Count = MasterDataSource.Count(c => c.Duration >= 30).ToString();
    }
    void OnCustomizeElement(GridCustomizeElementEventArgs eventArgs)
    {
        if (eventArgs.ElementType == GridElementType.DataCell && eventArgs.Column.Name!=nameof(RCSObject.Oid) && eventArgs.VisibleIndex >= 0)
        {
            var duration = Convert.ToInt32(eventArgs.Grid.GetRowValue(eventArgs.VisibleIndex, nameof(RPMSummaryInfo.Duration)));
            if (duration == 0)
                eventArgs.CssClass = "text-danger font-weight-bold";
            else if (duration >= 1 && duration < 30)
                eventArgs.CssClass = "text-warning font-weight-bold";
            else if (duration != null && duration >= 30)
                eventArgs.CssClass = "text-success font-weight-bold";
        }

    }
    private string GetCardColor(string cardName)
    {
        switch (cardName)
        {
            case "All":
                return "text-info";
            case "Duration = 0":
                return "text-danger";
            case "Duration > 1":
```



```
    }

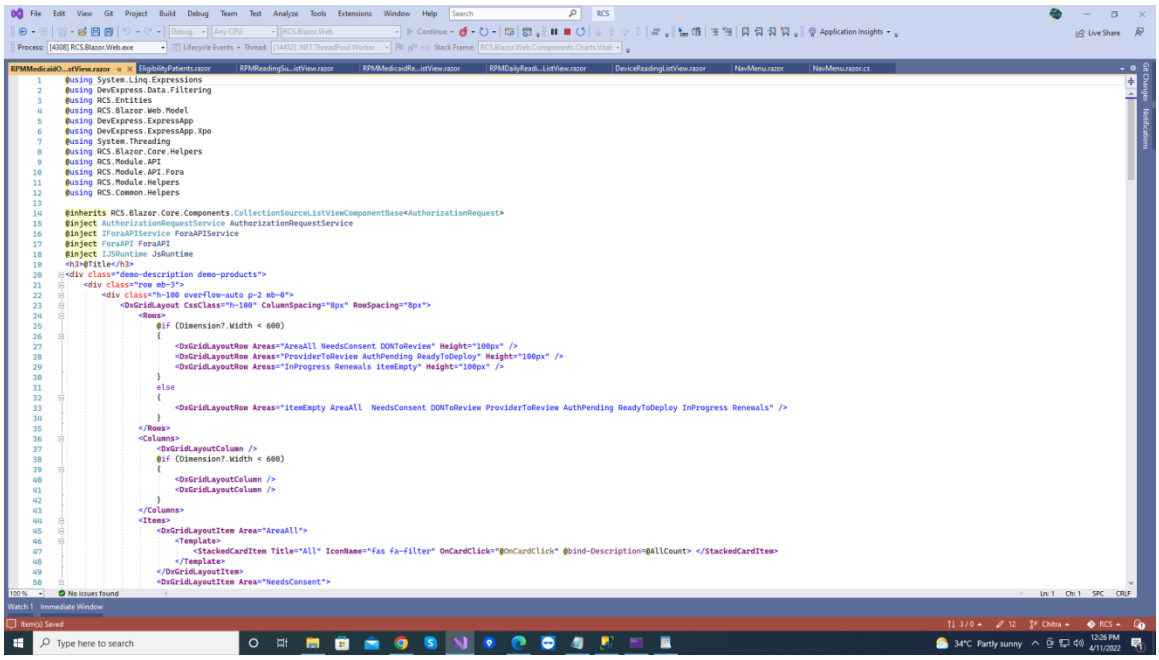
    private void RefreshCardCount()
    {
        AllCount = MasterDataSource.Count().ToString();
        E0Count = MasterDataSource.Count(c => c.Duration == 0).ToString();
        L20Count = MasterDataSource.Count(c => c.Duration >= 1 && c.Duration < 30).ToString();
        G20Count = MasterDataSource.Count(c => c.Duration >= 30).ToString();
    }
    void OnCustomizeElement(GridCustomizeElementEventArgs eventArgs)
    {
        if (eventArgs.ElementType == GridElementType.DataCell && eventArgs.Column.Name!=nameof(RCSObject.Oid) && eventArgs.VisibleIndex >= 0)
        {
            var duration = Convert.ToInt32(eventArgs.Grid.GetRowValue(eventArgs.VisibleIndex, nameof(RPMSummaryInfo.Duration)));
            if (duration == 0)
                eventArgs.CssClass = "text-danger font-weight-bold";
            else if (duration >= 1 && duration < 30)
                eventArgs.CssClass = "text-warning font-weight-bold";
            else if (duration != null && duration >= 30)
                eventArgs.CssClass = "text-success font-weight-bold";
        }

    }
    private string GetCardColor(string cardName)
    {
        switch (cardName)
        {
            case "All":
                return "text-info";
            case "Duration = 0":
                return "text-danger";
            case "Duration > 1":
                return "text-warning";
            case "Duration >= 20":
                return "text-success";
            case "Device setup and training":
                return "text-success";

        }
        return "text-info";
    }
    void onShareClick(Guid key)
    {
        MainLayout.CreateNewMessage(key, typeof(Patient));
    }
    protected async Task OnRefreshMasterClick(ToolbarItemClickEventArgs args)
    {
        _gridMaster?.Refresh();
        RefreshCardCount();
    }
```

RPM OnBoarding:

On Clicking:



```
@using System.Linq.Expressions
@using DevExpress.Data.Filtering
@using RCS.Entities
@using RCS.Blazor.Web.Model
@using DevExpress.ExpressApp
@using DevExpress.ExpressApp.Xpo
@using System.Threading
@using RCS.Blazor.Core.Helpers
@using RCS.Module.API
@using RCS.Module.API.Fora
@using RCS.Module.Helpers
@using RCS.Common.Helpers

@inherits RCS.Blazor.Core.Components.CollectionSourceListViewComponentBase<AuthorizationRequest>
@inject AuthorizationRequestService AuthorizationRequestService
@inject IForaAPIService ForaAPIService
@inject ForaAPI ForaAPI
@inject IJSRuntime JsRuntime
<h3>@Title</h3>
<div class="demo-description demo-products">
    <div class="row mb-3">
        <div class="h-100 overflow-auto p-2 mb-0">
            <DxGridLayout CssClass="h-100" ColumnSpacing="8px" RowSpacing="8px">
                <Rows>
                    @if (Dimension?.Width < 600)
                    {
                        <DxGridLayoutRow Areas="AreaAll NeedsConsent DONToReview" Height="100px" />
                        <DxGridLayoutRow Areas="ProviderToReview AuthPending ReadyToDeploy" Height="100px" />
                        <DxGridLayoutRow Areas="InProgress Renewals itemEmpty" Height="100px" />
                    }
                    else
                    {
                        <DxGridLayoutRow Areas="itemEmpty AreaAll  NeedsConsent DONToReview ProviderToReview AuthPending ReadyToDeploy InProgress Renewals" />
                    }
                </Rows>
                <Columns>
                    <DxGridLayoutColumn />
                    @if (Dimension?.Width < 600)
                    {
                        <DxGridLayoutColumn />
                        <DxGridLayoutColumn />
                    }
                </Columns>
                <Items>
                    <DxGridLayoutItem Area="AreaAll">
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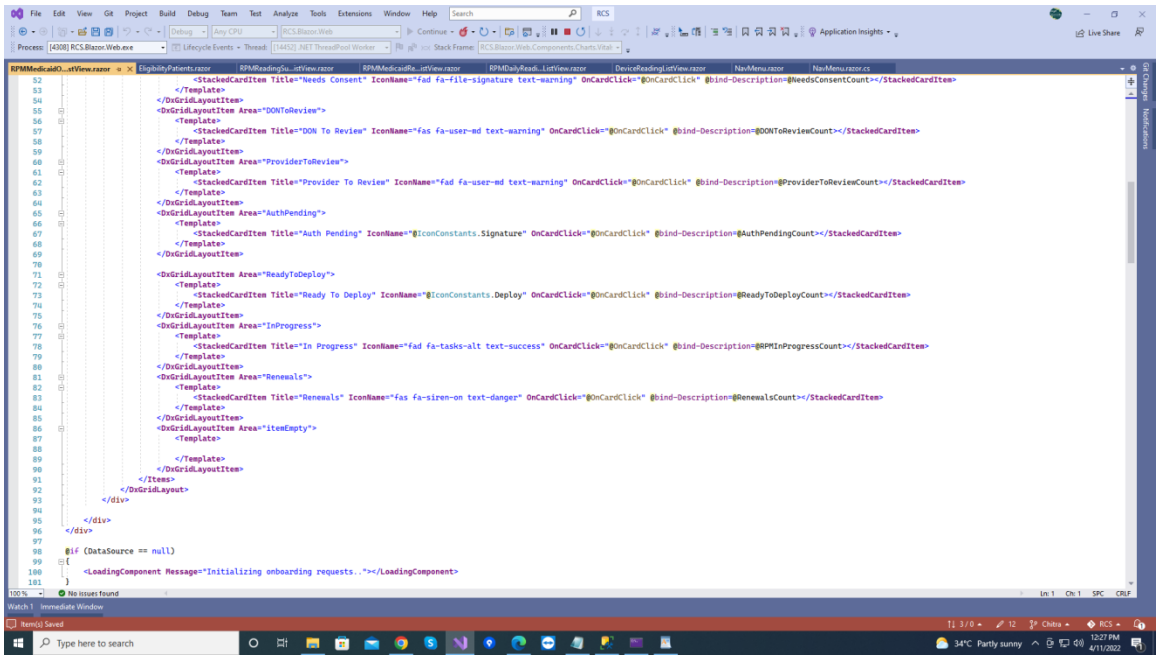
                        </Template>
                    </DxGridLayoutItem>
                    <DxGridLayoutItem Area="NeedsConsent">
```



```
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                </DxGridLayoutItem>
                <DxGridLayoutItem Area="ProviderToReview">
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                <DxGridLayoutItem Area="InProgress">
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                    <Template>

                    </Template>
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    </div>

    </div>
</div>

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{
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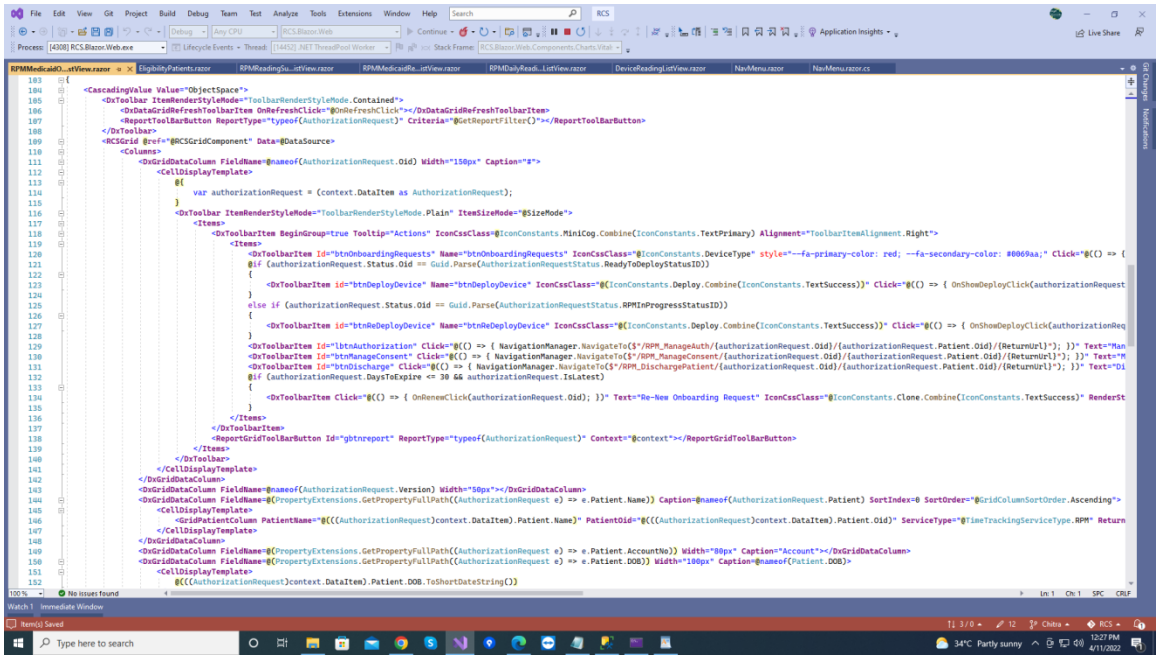
}
```



```
{
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        </DxToolbar>
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            <Columns>
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                    <CellDisplayTemplate>
                        @{
                            var authorizationRequest = (context.DataItem as AuthorizationRequest);
                        }
                        <DxToolbar ItemRenderStyleMode="ToolbarRenderStyleMode.Plain" ItemSizeMode="@SizeMode">
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                                    <Items>
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                                        @if (authorizationRequest.Status.Oid == Guid.Parse(AuthorizationRequestStatus.ReadyToDeployStatusID))
                                        {
                                            <DxToolbarItem id="btnDeployDevice" Name="btnDeployDevice" IconCssClass="@(IconConstants.Deploy.Combine(IconConstants.TextSuccess))" Click="@(() => { OnShowDeployClick(authorizationRequest
                                        }
                                        else if (authorizationRequest.Status.Oid == Guid.Parse(AuthorizationRequestStatus.RPMInProgressStatusID))
                                        {
                                            <DxToolbarItem id="btnReDeployDevice" Name="btnReDeployDevice" IconCssClass="@(IconConstants.Deploy.Combine(IconConstants.TextSuccess))" Click="@(() => { OnShowDeployClick(authorizationReq
                                        }
                                        <DxToolbarItem Id="lbtnAuthorization" Click="@(() => { NavigationManager.NavigateTo($"/RPM_ManageAuth/{authorizationRequest.Oid}/{authorizationRequest.Patient.Oid}/{ReturnUrl}"); })" Text="Man
                                        <DxToolbarItem Id="btnManageConsent" Click="@(() => { NavigationManager.NavigateTo($"/RPM_ManageConsent/{authorizationRequest.Oid}/{authorizationRequest.Patient.Oid}/{ReturnUrl}"); })" Text="M
                                        <DxToolbarItem Id="btnDischarge" Click="@(() => { NavigationManager.NavigateTo($"/RPM_DischargePatient/{authorizationRequest.Oid}/{authorizationRequest.Patient.Oid}/{ReturnUrl}"); })" Text="Di
                                        @if (authorizationRequest.DaysToExpire <= 30 && authorizationRequest.IsLatest)
                                        {
                                            <DxToolbarItem Click="@(() => { OnRenewClick(authorizationRequest.Oid); })" Text="Re-New Onboarding Request" IconCssClass="@IconConstants.Clone.Combine(IconConstants.TextSuccess)" RenderSt
                                        }
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                            </Items>
                        </DxToolbar>
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                        <GridPatientColumn PatientName="@(((AuthorizationRequest)context.DataItem).Patient.Name)" PatientOid="@(((AuthorizationRequest)context.DataItem).Patient.Oid)" ServiceType="@TimeTrackingServiceType.RPM" Return
                    </CellDisplayTemplate>
                </DxGridDataColumn>
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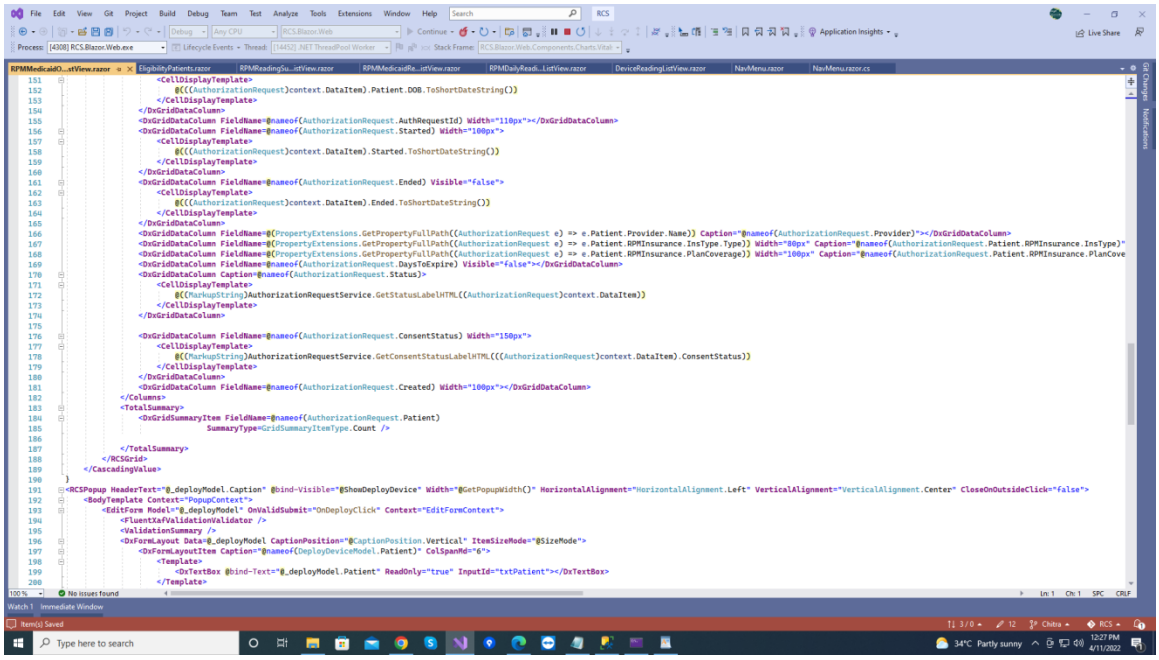
```



```
                    <CellDisplayTemplate>
                        @(((AuthorizationRequest)context.DataItem).Patient.DOB.ToShortDateString())
                    </CellDisplayTemplate>
                </DxGridDataColumn>
                <DxGridDataColumn FieldName=@nameof(AuthorizationRequest.AuthRequestId) Width="110px"></DxGridDataColumn>
                <DxGridDataColumn FieldName=@nameof(AuthorizationRequest.Started) Width="100px">
                    <CellDisplayTemplate>
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                </DxGridDataColumn>
                <DxGridDataColumn FieldName=@nameof(AuthorizationRequest.Ended) Visible="false">
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                </DxGridDataColumn>
                <DxGridDataColumn FieldName=@(PropertyExtensions.GetPropertyFullPath((AuthorizationRequest e) => e.Patient.Provider.Name)) Caption="@nameof(AuthorizationRequest.Provider)"></DxGridDataColumn>
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                <DxGridDataColumn FieldName=@(PropertyExtensions.GetPropertyFullPath((AuthorizationRequest e) => e.Patient.RPMInsurance.PlanCoverage)) Width="100px" Caption="@nameof(AuthorizationRequest.Patient.RPMInsurance.PlanCove
                <DxGridDataColumn FieldName=@nameof(AuthorizationRequest.DaysToExpire) Visible="false"></DxGridDataColumn>
                <DxGridDataColumn Caption=@nameof(AuthorizationRequest.Status)>
                    <CellDisplayTemplate>
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                    </CellDisplayTemplate>
                </DxGridDataColumn>

                <DxGridDataColumn FieldName=@nameof(AuthorizationRequest.ConsentStatus) Width="150px">
                    <CellDisplayTemplate>
                        @((MarkupString)AuthorizationRequestService.GetConsentStatusLabelHTML(((AuthorizationRequest)context.DataItem).ConsentStatus))
                    </CellDisplayTemplate>
                </DxGridDataColumn>
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            <TotalSummary>
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            </TotalSummary>
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}
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    <BodyTemplate Context="PopupContext">
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            <ValidationSummary />
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                <DxFormLayoutItem Caption="@nameof(DeployDeviceModel.Patient)" ColSpanMd="6">
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                    </Template>
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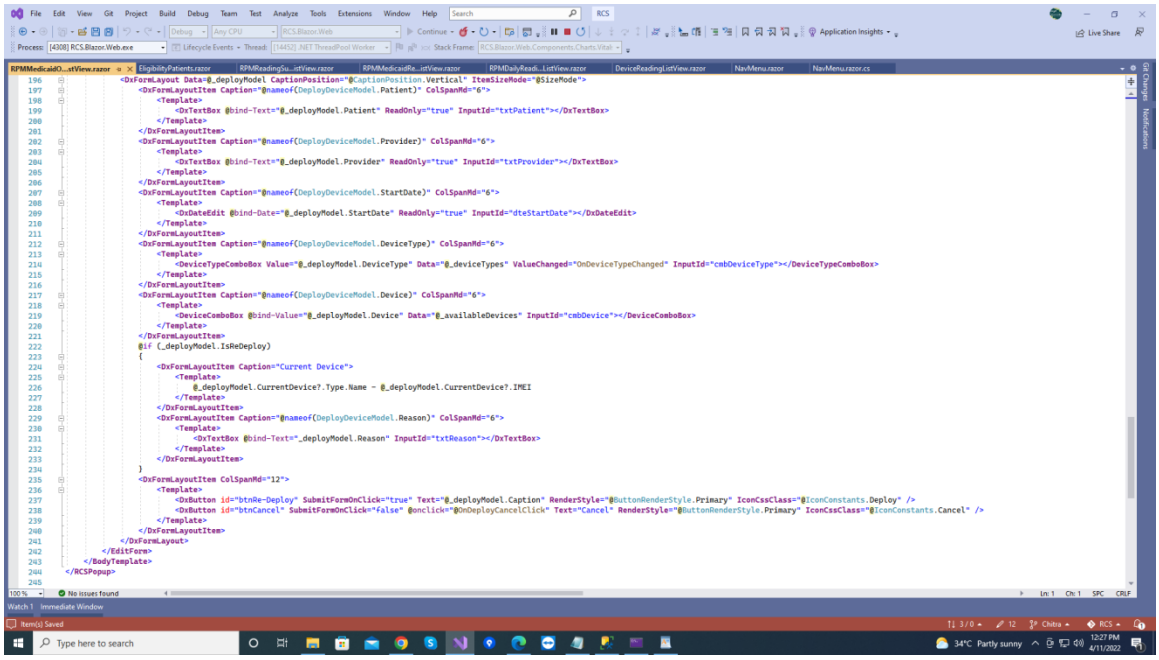
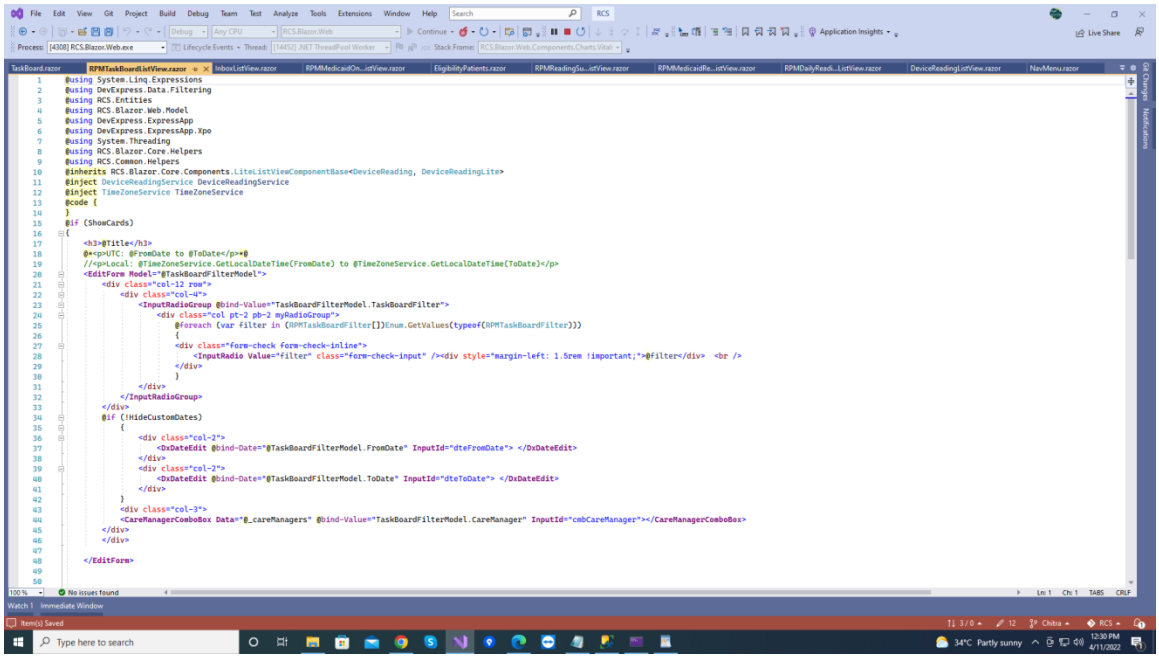
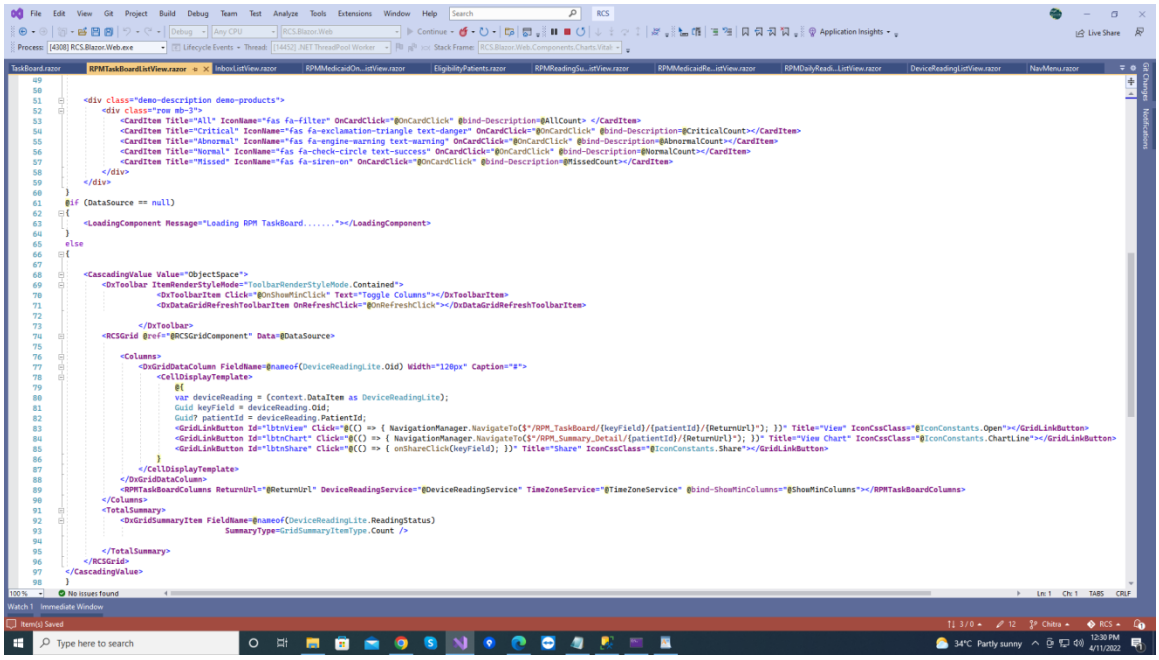


RPM TaskBoard:

On Clicking:





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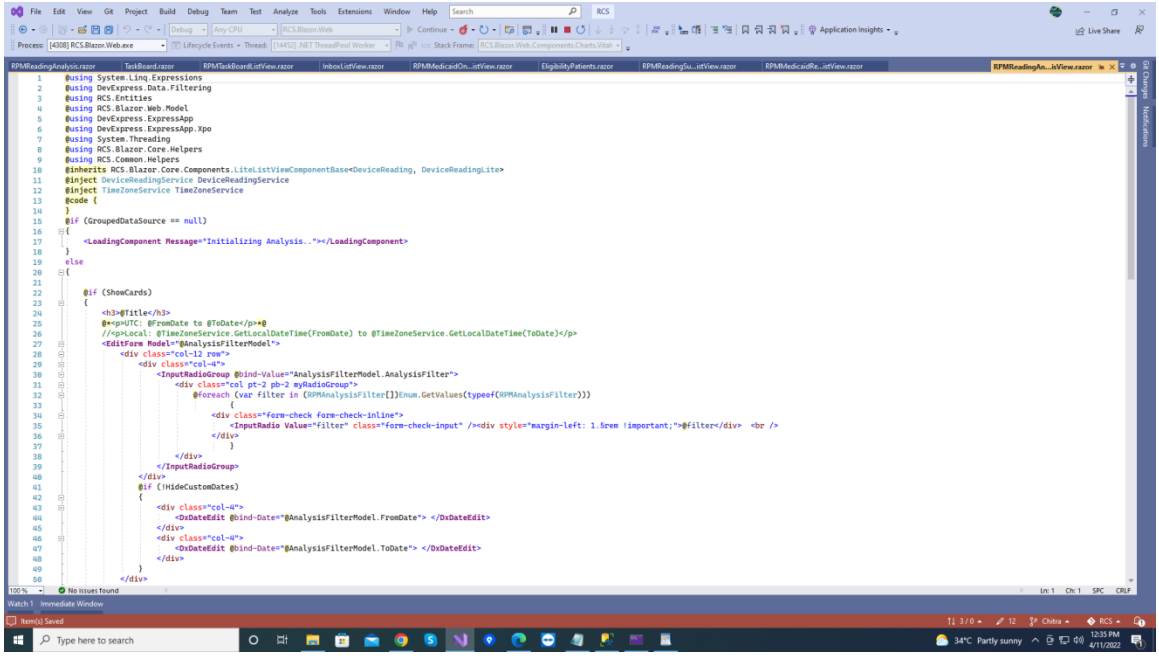

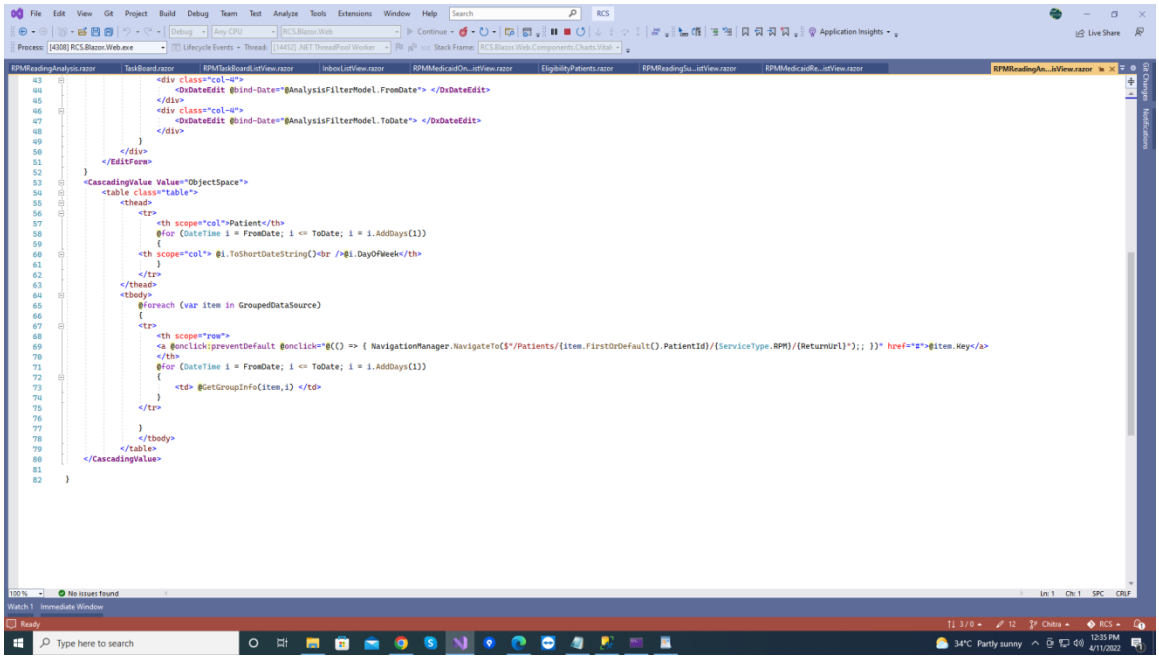
File Edit View Git Project Build Debug Team Test Analyze Tools Extensions Window Help
RCS
Application Insights
Live Share
RPMReadingAnalysis.razor
TaskBoard.razor
RPMTaskBoardListView.razor
InboxListView.razor
RPMMedicaidOn...istView.razor
EligibilityPatients.razor
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RPMMedicaidRe...istView.razor
RPMReadingAn...isView.razor
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<thead>
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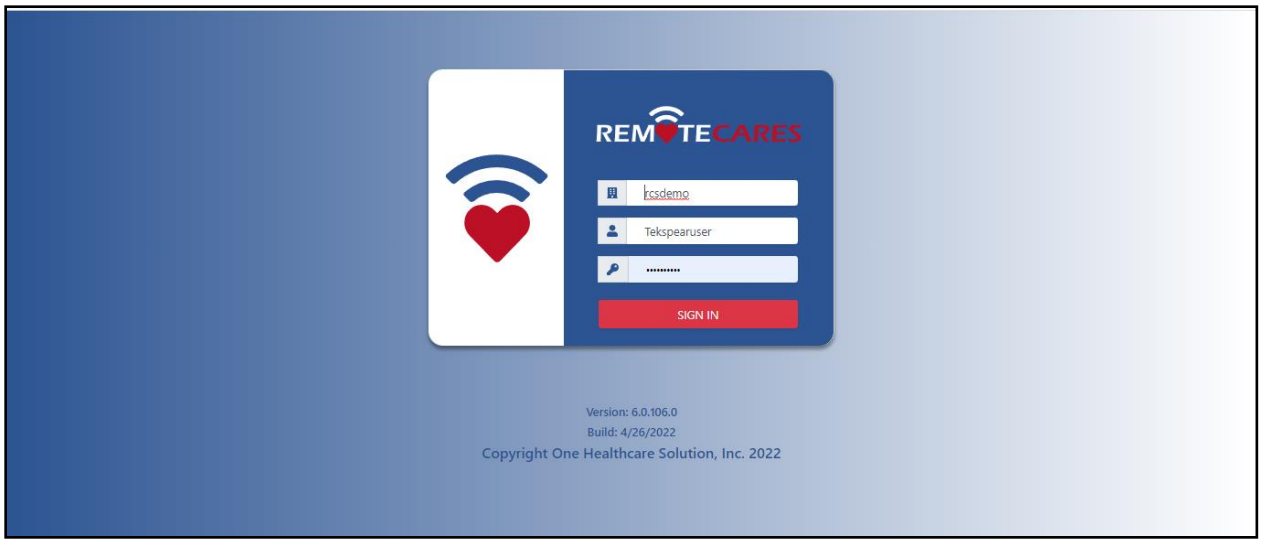
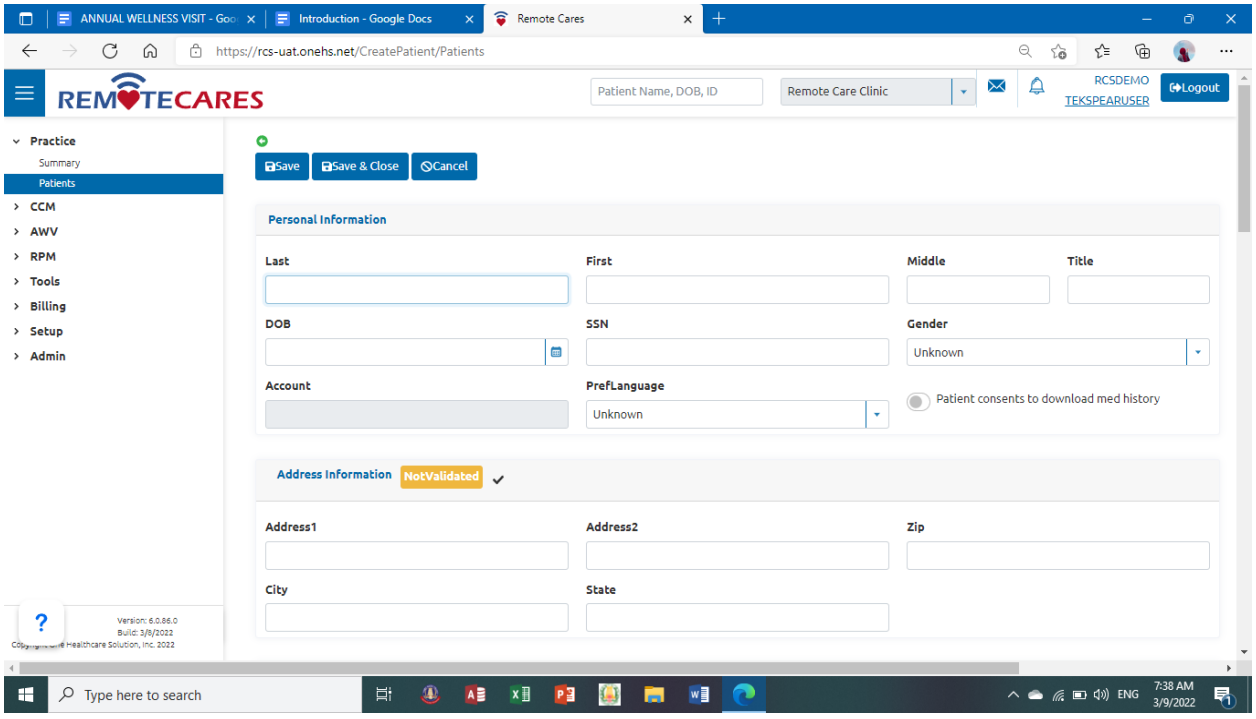
@for (DateTime i = FromDate; i <= ToDate; i = i.AddDays(1))
{
<th scope="col"> @i.ToShortDateString()
@i.DayOfWeek</th>
}
</tr>
</thead>
<tbody>
@foreach (var item in GroupedDataSource)
{
<tr>
<th scope="row">
<a @onclick:preventDefault @onclick="@(() => { NavigationManager.NavigateTo($"/Patients/{item.FirstOrDefault().PatientId}/{ServiceType.RPM}/{ReturnUrl}");; })" href="#">@item.Key
</th>
@for (DateTime i = FromDate; i <= ToDate; i = i.AddDays(1))
{
<td> @GetGroupInfo(item,i) </td>
}
</tr>
}
</tbody>
</table>
</CascadingValue>
}
100 %
No issues found
Ln: 1 Ch: 1 SPC CRLF
Watch 1 Immediate Window
Ready
Type here to search
34°C Partly sunny
12:35 PM
4/11/2022

SCREENSHOTS

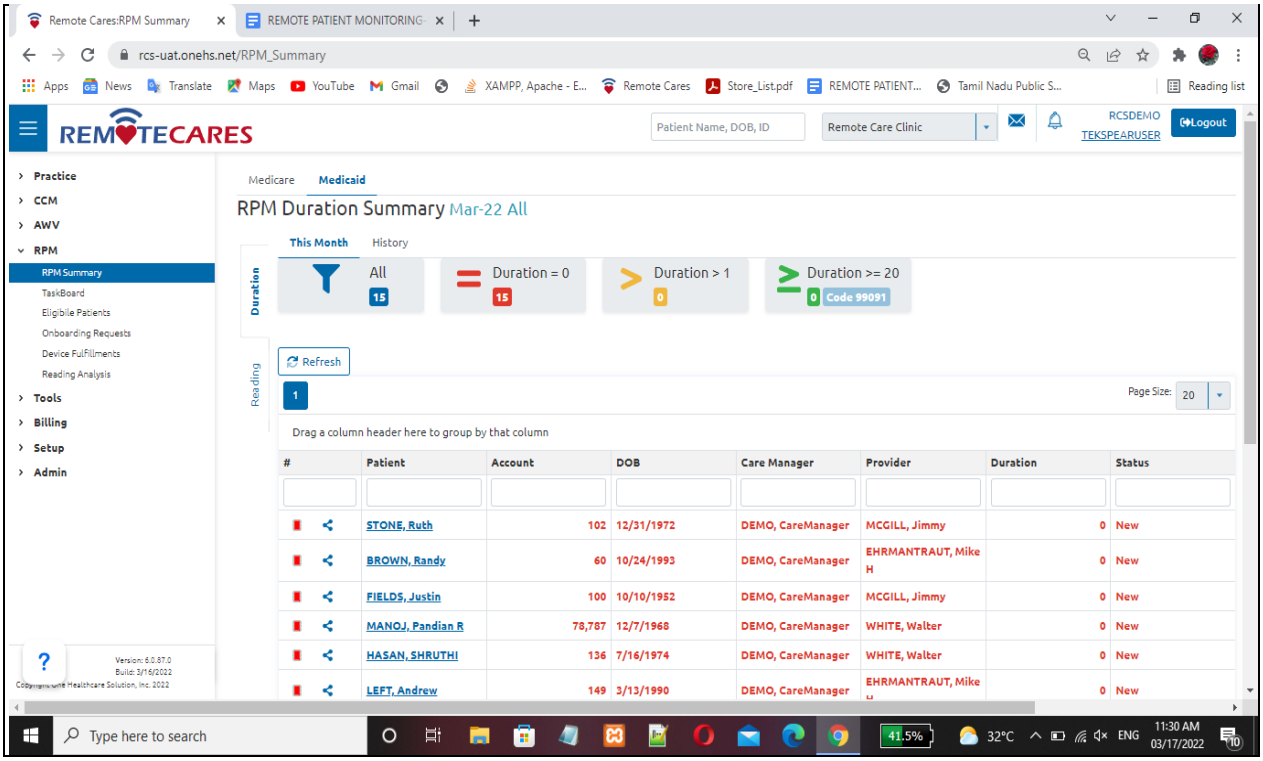
Login page:



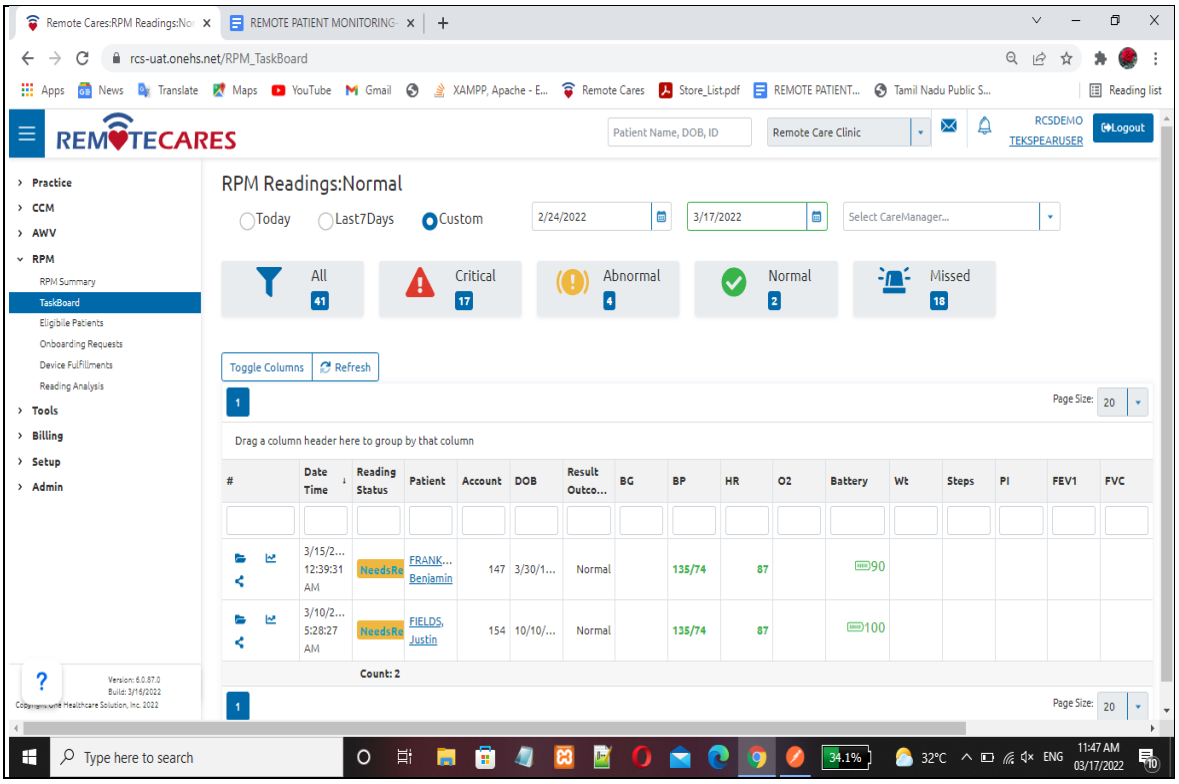
Create patient:



Rpm summary:



Taskboard:



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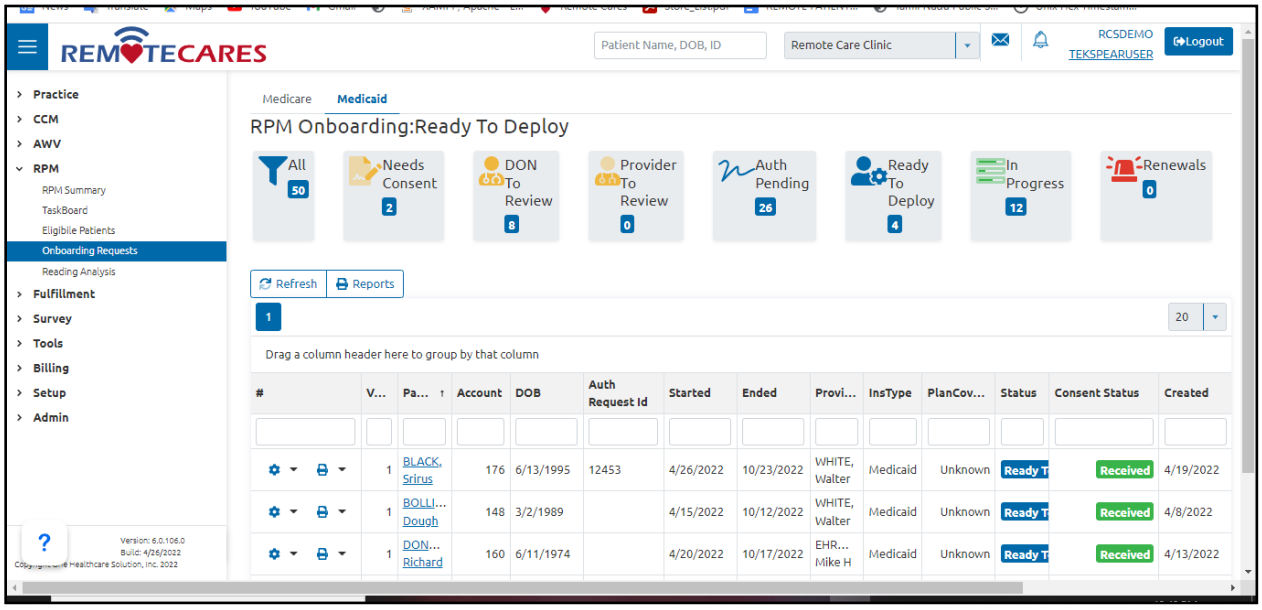
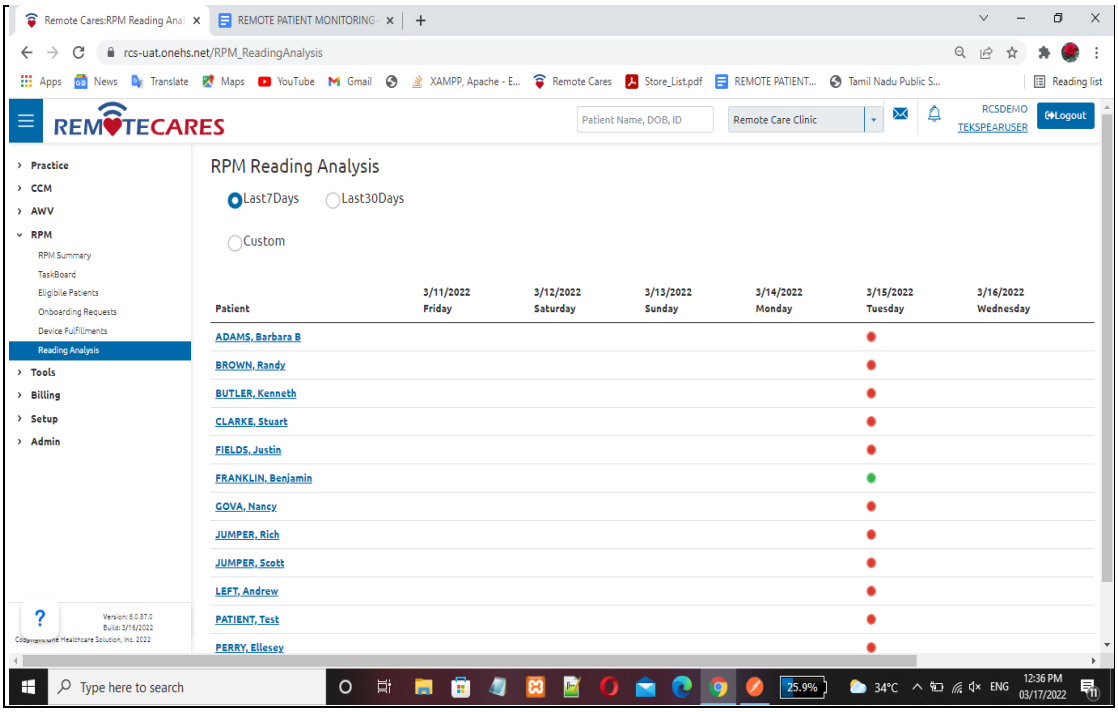
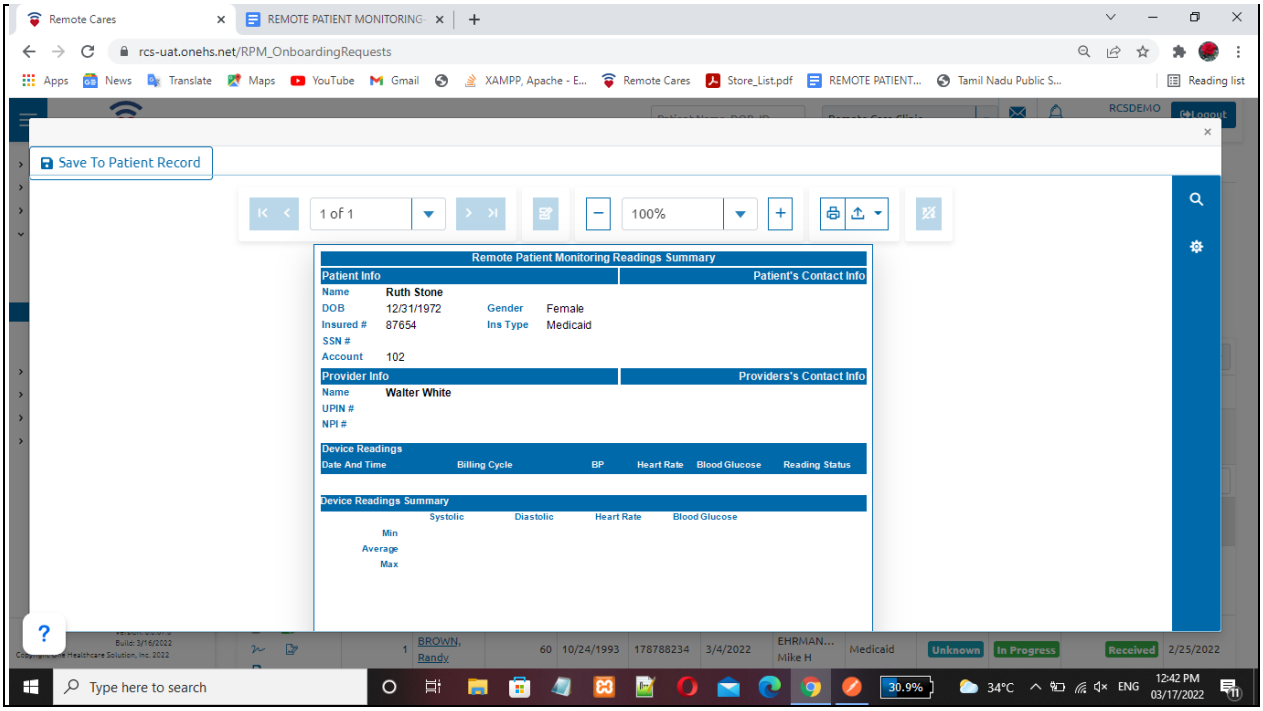


Reading Analysis:



Report generation:



CONCLUSION

Remote Patient Monitoring systems are especially useful because they let the patients live their life while at the same time afford constant medical attention.It is not just monitoring, it should grow as a user community to help each other and serve efficiently during emergency situations.More than a single patient at different places can be monitored using such systems. The need for visiting the clinic/doctor is pushed to only deserving cases. Offline or online RPM devices are effective patient companions at all times.It is evident that remote patient monitoring is a health information technology concept that is rapidly evolving and bringing fundamental changes to the health care sector.

By providing an efficient method of collecting, transmitting, and analyzing patient data, medical professionals can quickly respond to necessary interventions or changes to ongoing treatments. Registered nurses will adapt their role to working with patients through telemedicine which is backed up by the support of digital information. Most of the challenges to the introduction of patient monitoring in the health care setting can be overcome with preparation and training.In conclusion, this revolutionary technology should be widely adopted into the health care system as a critical support piece of health IT infrastructure.

FUTURE ENHANCEMENT

There is scope for future development for this project.

- ✓ The world of computer fields is not static, it is always subject to be dynamic.
- ✓ The technology which is famous today becomes outdated the very next day.
- ✓ Same applies to the Remote Patient Monitoring.
- ✓ There could be major change in the type of devices we use to do readings.
- ✓ New Vitals360 device which is capable of doing BP,BG, Temperature, EKG, SPO2.
- ✓ Enhancing the application to support such device type would be a great enhancement to have.

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- Carthy Z. Emergency Tele-Home Health Care. Telemedicine Today. 1995;3(4):10–11.

GOLD LOAN PROCESSING SYSTEM APPLICATION

A project submitted to

ST. MARY'S COLLEGE (Autonomous), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

in partial fulfillment of the award of the degree of

MASTER OF COMPUTER SCIENCE

Submitted by

MATHI. G

Regno: 20SPCS12

Under the Supervision and Guidance of

Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D.,

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi– 628001

MAY 2022

CERTIFICATE

This is to certify that this project work entitled as **"GOLD LOAN PROCESSING SYSTEM APPLICATION"** is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to **Manonmaniam Sundaranar University, Tirunelveli**, in partial fulfillment for the award of the degree of Master of **Computer Science** for the work done during the year 2021-2022 by **Mathi. G (Reg.no. : 20SPCS12).**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do hereby declare that the project entitled "**GOLD LOAN PROCESSING SYSTEM APPLICATION**" submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D.,** Assistant Professor, PG Department of Computer Science (SSC), St. Mary's College (Autonomous), Thoothukudi.

Station: Thoothukudi. **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. Josephine Jeyarani, Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms.C.Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and Coordinator, PG Department of Computer Science(SSC),for her support and counsel.

I express my hearty thanks to my guide Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant professor, PG Department of Computer Science (SSC),for her support and counsel. For her valuable suggestions, gentle guidance, enthusiastic ideas, to carry out and complete my work entirely.

I also express my boundless thanks to Ms. A. Jenitta Jebamalar M.Sc (IT)., M.Sc (CS)., M.Phil., B.Ed., Assistant Professor, PG Department of Computer Science (SSC),for their kind cooperation in successful completion of the project.

I am much indebted to Dr. P. Johnson Durai Raj for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

POSTULATE

14-05-2022

To

The Head of the Department

PG Department of Computer Science (SSC)

St. Mary's College (Autonomous)

Thoothukudi

Dear Sir/Madam,

Sub: Project Completion Certificate-Reg

On behalf of **POSTULATE**, We are pleasure to inform you that **Ms. G. Mathi, Reg No: 20SPCS12** studying **Master of Computer Science** Final year has been done the project work at our concern on **"Gold Loan Processing System App"** during the period from February 2022 to May 2022.

During this period, we noticed her to be diligent, sincere and hardworking and she accomplished her task within stipulated deadline. We wish her for all future endeavors.

POSTULATE INFO TECH * Thoothukudi *

PROJECT DIRECTOR

ABSTRACT

The online portal for the gold loan agencies that provide loan to the customer by picking information from the customers which was verified to provide gold loan and passes the approval for gold loan. This project interface provides loan for a customer and tracks the status from time-to-time along with the loan approval to verify and accept/reject the customer file. It helps only the loan agency organization to check the pending, complete the formalities and procedures between the departments and arrive at decisions to very fact in addition to providing a transparency system for everyone. Gold loan processing system is an online information source developed for gold loan agencies to facilitate the organization in applying for various gold loans. This tool has been designed to facilitate the flow of information within the organization. It provides the facility of customer profile, provide loan, tax challans, and receiving payments against challans. Thus, the gold loan system helps to simplify the loan system for making the work easy.

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1. INTRODUCTION

"Gold Loan Processing System" project is a model of Gold loan Application. This Application enables only the admin to maintain the gold loan process of users. The admin can access the application or view the users Account details and maintains the information of account. With Gold Loan Processing System, the brick and mortar structure of the traditional loan processing gets converted into a click and portal model, thereby giving a concept of virtual gold loan processing a real shape.

The primary aim of this "Gold Loan Processing System" is to provide an improved design methodology, which envisages the future expansion, and modification, which is necessary for a core sector like Gold Loan Processing. This necessitates the design to be expandable and modifiable and so a modular approach is used in developing the application software. Anybody who is an admin in the pawn shop can become a member of Gold Loan Processing System. He can login to the home page using their specific user name and password. Then admin will be redirected to the home page.

Now a day's, managing a gold loan is tedious job up to certain limit. So, software that reduces the work is essential. Also, today's world is a genuine computer world and is getting faster and faster day-by-day. Thus, considering above necessities, the software for gold loan processing has become necessary which would be useful in managing the gold loan process more efficiently. The software is meant to overcome the drawbacks of the manual system.

The application has been developed using the most powerful frontend ionic/angular and secure backend Django mysql database and the most widely accepted web oriented as well as application oriented. The Traditional way of maintaining details of a customer in a pawn shop was to enter the details and record them. Every time the admin needs to perform some gold loan process, he has to save some information in a manual way and perform the necessary actions, which may not be so feasible all the time. It may be a hard-hitting task for the admin and the customers too. Gold Loan Processing System project captures

activities performed by different roles in real life gold loan processing which provides enhanced techniques for maintaining the required information up-to-date, which results in efficiency. The project gives real life understanding of Gold Loan Processing System and activities performed by various roles in the supply chain.

2. SYSTEM SPECIFICATION

HARDWARE REQUIREMENTS:

Hardware support the PC with below mentioned configuration.

- Processor : Pentium –IV
- Speed : 1.1 GHz
- RAM : 512 MB (minimum)
- Hard Disk : 40 GB
- Floppy Drive : 1.44 MB
- Key Board : Standard Windows Keyboard
- Mouse : Two or Three Button Mouse
- Monitor : SVGA

SOFTWARE REQUIRMENTS:

Software specification for the system are detailed as follows:

- OPERATING SYSTEM : Windows XP or Win7
- FRONT END : Ionic/Angular
- BACK END : Django
- CODING : Python
- DOCUMENTION : MS-Office 2007

SOFTWARE DESCRIPTION:

- **Python**

Python is a multi-paradigm programming language. Object-oriented programming and structured programming are fully supported, and many of its features support functional programming and aspect-oriented programming (including by metaprogramming and meta-objects (magic methods)). Many other paradigms are supported via extensions, including design by contract and logic programming.

Python uses dynamic typing and a combination of reference counting and a cycle-detecting garbage collector for memory management. It also features dynamic name resolution (late binding), which binds method and variable names during program execution.

Python's design offers some support for functional programming in the Lisp tradition. It has filter, map, and reduce functions; list comprehensions, dictionaries, sets, and generator expressions. The standard library has two modules (iter tools and func tools) that implement functional tools borrowed from Haskell and Standard ML.

The language's core philosophy is summarized in the document The Zen of Python (PEP 20), which includes aphorisms such as:

- Beautiful is better than ugly.
- Explicit is better than implicit.
- Simple is better than complex.
- Complex is better than complicated.
- Readability counts.

Rather than having all of its functionality built into its core, Python was designed to be highly extensible. This compact modularity has made it particularly popular as a means of adding programmable interfaces to existing applications. Van Rossum's vision of a small core language with a large standard library and easily extensible interpreter stemmed from his frustrations with ABC, which espoused the opposite approach.

Python strives for a simpler, less-cluttered syntax and grammar while giving developers a choice in their coding methodology. In contrast to Perl's "there is more than

one way to do it" motto, Python embraces a "there should be one—and preferably only one—obvious way to do it" design philosophy. Alex Martelli, a Fellow at the Python Software Foundation and Python book author, writes that "To describe something as 'clever' is not considered a compliment in the Python culture."

Python's developers strive to avoid premature optimization, and reject patches to non-critical parts of the CPython reference implementation that would offer marginal increases in speed at the cost of clarity. When speed is important, a Python programmer can move time-critical functions to extension modules written in languages such as C, or use PyPy, a just-in-time compiler. Cython is also available, which translates a Python script into C and makes direct C-level API calls into the Python interpreter.

An important goal of Python's developers is keeping it fun to use. This is reflected in the language's name—a tribute to the British comedy group Monty Python[70]—and in occasionally playful approaches to tutorials and reference materials, such as examples that refer to spam and eggs (from a famous Monty Python sketch) instead of the standard foo and bar.

A common neologism in the Python community is pythonic, which can have a wide range of meanings related to program style. To say that code is pythonic is to say that it uses Python idioms well, that it is natural or shows fluency in the language, that it conforms with Python's minimalist philosophy and emphasis on readability. In contrast, code that is difficult to understand or reads like a rough transcription from another programming language is called unpythonic.

Users and admirers of Python, especially those considered knowledgeable or experienced, are often referred to as Pythonistas.

- **Ionic**

Ionic is a complete open-source SDK for hybrid mobile app development created by Max Lynch, Ben Sperry, and Adam Bradley of Drifty Co. in 2013. The original version was released in 2013 and built on top of AngularJS and Apache Cordova. However, the latest release was re-built as a set of Web Components, allowing the user to choose any user interface framework, such as Angular, React or Vue.js. It also allows the use of Ionic

components with no user interface framework at all. Ionic provides tools and services for developing hybrid mobile, desktop, and progressive web apps based on modern web development technologies and practices, using Web technologies like CSS, HTML5, and Sass. In particular, mobile apps can be built with these Web technologies and then distributed through native app stores to be installed on devices by utilizing Cordova or Capacitor.

- **Angular**

Angular (commonly referred to as "Angular 2+" or "Angular CLI") is a TypeScript-based free and open-source web application framework led by the Angular Team at Google and by a community of individuals and corporations. Angular is a complete rewrite from the same team that built AngularJS. Angular is used as the frontend of the MEAN stack, consisting of MongoDB database, Express.js web application server framework, Angular itself (or AngularJS), and Node.js server runtime environment.

- **Django**

Django is a Python-based free and open-source web framework that follows the model–template–views (MTV) architectural pattern. It is maintained by the Django Software Foundation (DSF), an independent organization established in the US as a 501(c)(3) non-profit. Django's primary goal is to ease the creation of complex, database-driven websites. The framework emphasizes reusability and "pluggability" of components, less code, low coupling, rapid development, and the principle of don't repeat yourself. Python is used throughout, even for settings, files, and data models. Django also provides an optional administrative create, read, update and delete interface that is generated dynamically through introspection and configured via admin models. Some well-known sites that use Django include Instagram, Mozilla, Disqus, Bitbucket, Nextdoor and Clubhouse.

- **SQLite**

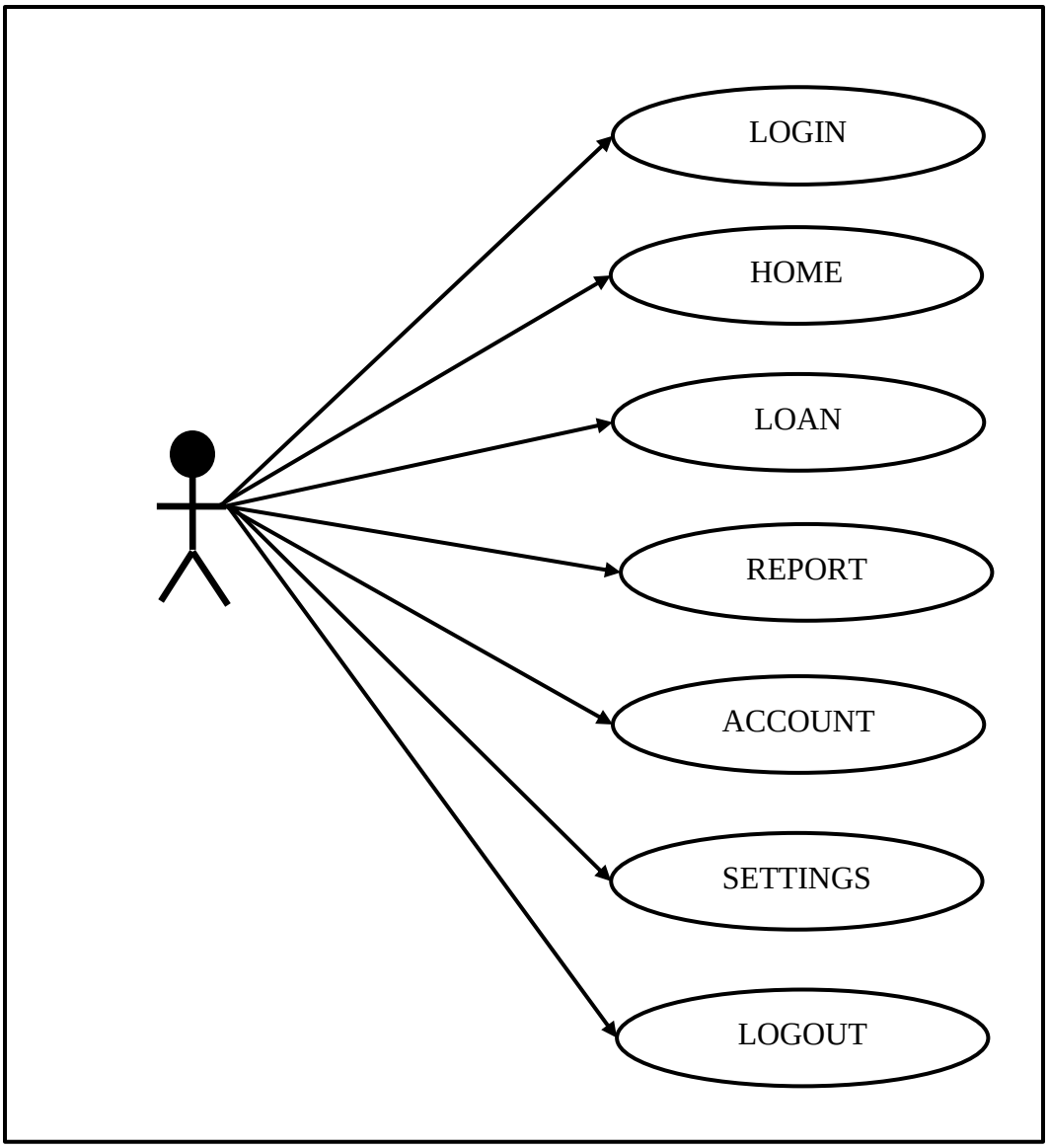
SQLite is a database engine written in the C language. It is not a standalone app; rather, it is a library that software developers embed in their apps. As such, it belongs to the family of embedded databases. It is the most widely deployed database engine, as it is

used by several of the top web browsers, operating systems, mobile phones, and other embedded systems.

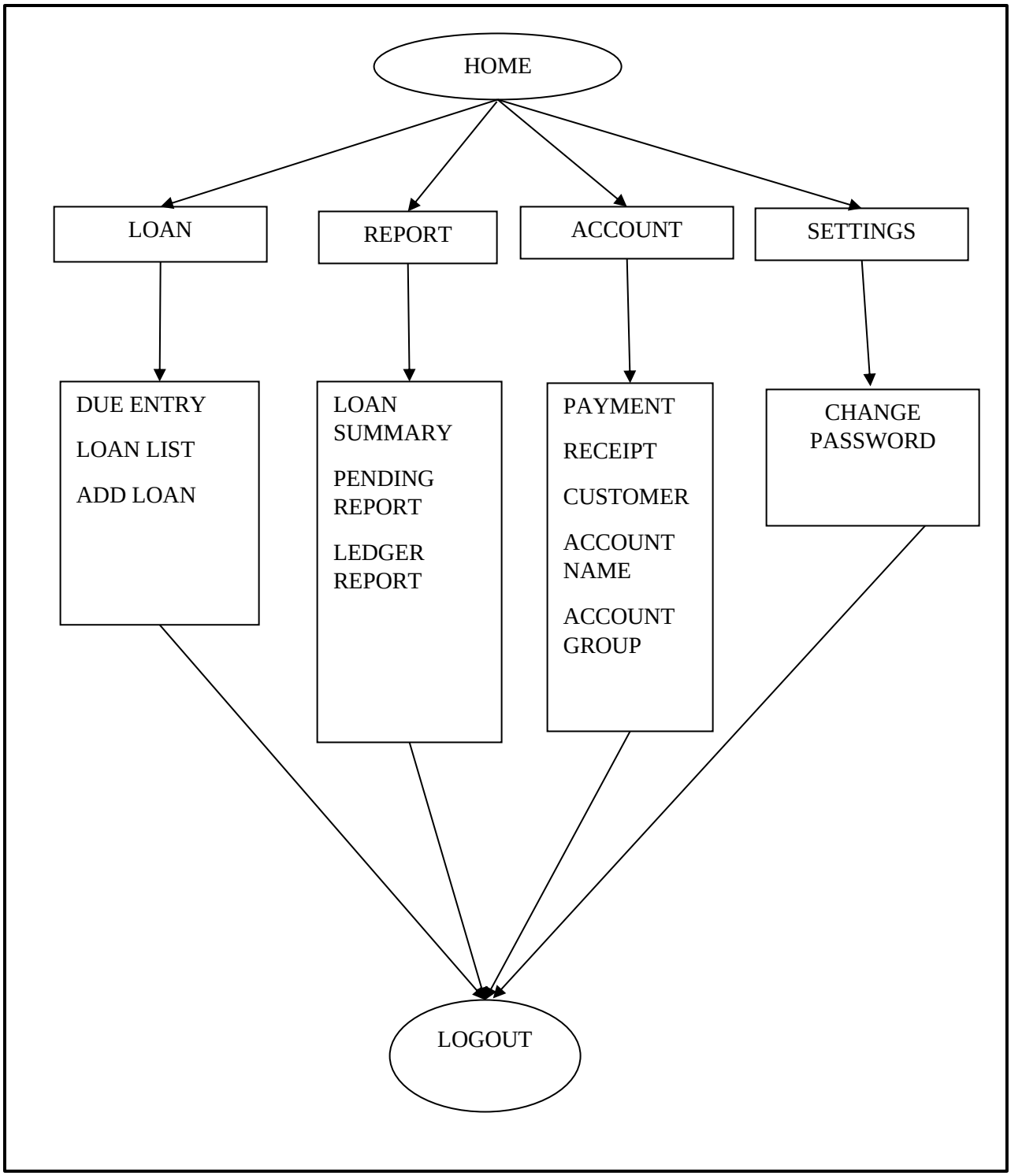
SQLite has bindings to many programming languages. It generally follows PostgreSQL syntax but does not enforce type checking. This means that one can, for example, insert a string into a column defined as an integer.

3. SYSTEM DESIGN

ADMIN LOGIN



HOME PAGE


HOME
LOAN
REPORT
ACCOUNT
SETTINGS
DUE ENTRY
LOAN LIST
ADD LOAN
LOAN SUMMARY
PENDING REPORT
LEDGER REPORT
PAYMENT
RECEIPT
CUSTOMER
ACCOUNT NAME
ACCOUNT GROUP
CHANGE PASSWORD
LOGOUT

4. PROJECT DESCRIPTION

- **ADMIN LOGIN**

Admin can access this application using their own user name and password. When admin enters, he will be directed to the page that will perform following functions

- ✓ Loan
- ✓ Report
- ✓ Account
- ✓ Settings
- ✓ Logout

Loan

In this page admin can view the details of a customer using,

- ✓ Due Entry
- ✓ Loan list
- ✓ Add loan

Due Entry

In this page list of all the loans for all the customers will be displayed in the table form. Details of a particular loan and the customer can be viewed by clicking the add circle in the action's column. Due entry of a particular loan can be added and due details will be displayed in a table. Balance loan amount of a particular customer can be calculated here.

Loan list

Loan details of all the customers will be displayed. In action column, the view icon enables to view the selected loan details with the customer details. Admin can add due date to the selected loan from the loan list table.

Add loan

This page displays the new account opening form for creating a new customer loan. Here admin stores all the personal details of the customer. Then he can save the account with submit button.

- **REPORT**

In report page, admin can view these functions

- ✓ Loan summary
- ✓ Pending report
- ✓ Ledger report

Loan summary

In Loan summary, admin can view the list of all the loan details. Customer name, Loan number, Loan amount, Due date, Interest, Actions will be displayed in that list.

Pending report

In Pending report, the admin will view all the pending reports which wants to be accepted or rejected**.** Each customer's details will be displayed here.

Ledger report

In Ledger report, the customer's loan details will be listed. All the loans of the customer, including details of every transaction going in and out of any accounts will be displayed here.

- **ACCOUNT**

In account page, these modules will be available

- ✓ Payment
- ✓ Receipt
- ✓ Customer
- ✓ Account Name
- ✓ Account group

Payment

In payment, admin can add the details of the account group, details of the amount and description. Each entry will be saved and it will be listed in the below table.

Receipt

In receipt, admin can enter the amount of money that is transferred from one account to another. Admin can update and delete any account group using the create option in actions column.

Customer

Admin can add the new customer in this page. Details of the existing customers also will be displayed. Admin can view any customers using search**.**

Account Name

In this page admin can add the new account group. Account Name list table will be displayed below.

Account group

In this page, admin can add the new account group name. Account group list table will be displayed below.

- **SETTING**S

Using settings admin can use this function,

- ✓ Change password

Change password

Admin can update password using this module.

- **LOG OUT**

Admin can log out anytime using this log out.

5. SYSTEM ANALYSIS

FEASIBILITY STUDY

The feasibility study of our proposed system can be analyzed in this section. In this system, it analyzes how the project objectives can be achieved successfully, accounting for internal and external influences that affect the project such as economic, technological, legal and time factors.

For this project, the factors considered include the following:

- How much investment is required for the development process?
- Are the skills required for developing this system?
- Is this system is technically provable?
- Will the final outcome of our proposed system be useful or usable?
- Will the proposed system is useful for major participants in the market?

TECHNICAL FEASIBILITY

In this technical feasibility study, conducted a study whether the technical assumptions of this proposed system are provable, whether the technical requirements and milestones of the system can be achievable with the resources available. In this study, the quality and quantity of the developers or designers are also studied to make the proposed system and to check both the development productivity and the skills of the programmers are enough sufficient for the development of the required proposed system.

ECONOMIC FEASIBILITY

In this economic feasibility study, conducted a study based on the cost or financially benefit analysis of the required project.

Economic feasibility study had performed as follows:

- How much capital and financial investment are available?
    - Software and hardware tools required for this project are free and open source. So, no capital investment is required. Need minimum financial requirements for internet subscriptions and these costs can be covered by the researcher.

- The developer does not have the required skill, Training Period for 19 days was taken for the study of the Ionic/Angular and Django Framework. After the training period, developer got the minimum skill to develop this application.

- How the project outcome is profitable?
  - The purpose of the proposed system is to provide the admin to provide loan to the customers, maintaining customer details, maintaining the companies internal and external transaction.

6. DATABASE DESCRIPTION

Table structure for table user login

Column	Type	Null	Default
user_id	int(11)	No	
Username	varchar(100)	No	
password	varchar(50)	No	

Table structure for table customer

Column	Type	Null	Default
cust_id	int(11)	No	
cust_name	varchar(600)	No	
gender	varchar(100)	Yes	NULL
Dob	Date	Yes	NULL
email	varchar(100)	Yes	NULL
address	varchar(700)	Yes	NULL
City	varchar(150)	Yes	NULL
pincode	varchar(150)	Yes	NULL
phnumber1	varchar(15)	Yes	NULL
phnumber2	varchar(15)	Yes	NULL

aadharno	varchar(600)	Yes	NULL
pancard	varchar(600)	Yes	NULL
bank_name	varchar(600)	Yes	NULL
branch_name	varchar(600)	Yes	NULL
account_no	varchar(600)	Yes	NULL
profilephoto	varchar(600)	Yes	NULL
ifsc_no	varchar(600)	Yes	NULL
referred	varchar(600)	Yes	NULL
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
delflag	varchar(3)	No	

Table structure for table loan

Column	Type	Null	Default
loan_id	int(11)	No	
loan_number	varchar(600)	No	
loan_date	datetime(6)	Yes	NULL
Address	varchar(600)	Yes	NULL
Aadhar	varchar(600)	Yes	NULL

City	varchar(600)	Yes	NULL
Pincode	varchar(600)	Yes	NULL
phone_no	varchar(600)	Yes	NULL
due_date	datetime(6)	Yes	NULL
auction_date	datetime(6)	Yes	NULL
loan_amount	varchar(600)	Yes	NULL
Interest	varchar(600)	Yes	NULL
Bankloanno	varchar(600)	Yes	NULL
Bankname	varchar(600)	Yes	NULL
Bankbrachname	varchar(600)	Yes	NULL
bank_loan_date	datetime(6)	Yes	NULL
bank_due_date	datetime(6)	Yes	NULL
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
Delflag	varchar(3)	No	
Customer	int(11)	Yes	NULL

Table structure for table loan_items

Column	Type	Null	Default
je_id	int(11)	No	
description	varchar(600)	Yes	NULL
items	varchar(600)	Yes	NULL
Gram	varchar(600)	Yes	NULL
amount	varchar(600)	Yes	NULL
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
delflag	varchar(3)	No	
Loan	int(11)	Yes	NULL

Table structure for table due_entry

Column	Type	Null	Default
due_id	int(11)	No	
Date	datetime(6)	Yes	NULL
Amount	varchar(600)	Yes	NULL
modeofpayment	varchar(600)	Yes	NULL
Receiptno	varchar(600)	Yes	NULL

Remark	varchar(600)	Yes	NULL
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
Delflag	varchar(3)	No	
Loan	int(11)	Yes	NULL

Table structure for table account_group

Column	Type	Null	Default
ag_id	int(11)	No	
ag_name	varchar(600)	Yes	NULL
ag_description	varchar(600)	Yes	NULL
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
Delflag	varchar(3)	No	

Table structure for table account_name

Column	Type	Null	Default
an_id	int(11)	No	
an_name	varchar(600)	Yes	NULL
an_description	varchar(600)	Yes	NULL
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
Delflag	varchar(3)	No	
ag_id	int(11)	Yes	NULL
cust_id	int(11)	Yes	NULL

Table structure for table transaction

Column	Type	Null	Default
trans_id	int(11)	No	
trans_type	varchar(600)	Yes	NULL
trans_amount	varchar(600)	Yes	NULL
trans_date	datetime(6)	Yes	NULL
trans_description	varchar(600)	Yes	NULL
create_date	datetime(6)	Yes	NULL

update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
Delflag	varchar(3)	No	
fan_id	int(11)	Yes	NULL
tan_id	int(11)	Yes	NULL

Table structure for table django_admin_log

Column	Type	Null	Default
Id	int(11)	No	
action_time	datetime(6)	No	
object_id	Longtext	Yes	NULL
object_repr	varchar(200)	No	
action_flag	smallint(5)	No	
change_message	Longtext	No	
content_type_id	int(11)	Yes	NULL
user_id	int(11)	No	

Table structure for table django_content_type

Column	Type	Null	Default
Id	int(11)	No	
app_label	varchar(100)	No	
Model	varchar(100)	No	

Table structure for table django_migrations

Column	Type	Null	Default
Id	bigint(20)	No	
App	varchar(255)	No	
Name	varchar(255)	No	
Applied	datetime(6)	No	

Table structure for table django_session

Column	Type	Null	Default
session_key	varchar(40)	No	
session_data	Longtext	No	
expire_date	datetime(6)	No	

7. CODING

```
<!-- <ion-header>
  <ion-toolbar>
    <ion-title>login</ion-title>
  </ion-toolbar>
</ion-header> -->

<ion-content>
  <app-logincomp></app-logincomp>
</ion-content>
<!-- <div class="form-bg">
  <div class="container">
     <div class="row">
        <div class="col-md-offset-4 col-md-4 col-sm-offset-3 col-sm-6">
           <div class="form-container">
              <form class="form-horizontal">
                 <h3 class="title">User Login</h3>
                 <div class="form-group">
                    <span class="input-icon"><i class="fa fa-user"></i></span>
                    <input class="form-control" type="text" id="username"
placeholder="Username">
                 </div>
                 <div class="form-group">
                    <span class="input-icon"><i class="fa fa-lock"></i></span>
                    <input class="form-control" type="password" id="password"
placeholder="Password">
                 </div>
<span class="forgot-pass"><a href="#">Lost password?</a></span>
<button class="btn signin" (click)="loginvalidation()">Login</button>
              </form>
           </div>
```

```
        </div>
      </div>
  </div>
</div> -->

<ion-content
scrollX="true" scrollY="true">
<!-
<linkrel="stylesheet"href="https://fonts.googleapis.com/css?family=Roboto">
<linkrel="stylesheet"href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.0
/css/bootstrap.min.css">

<linkrel="stylesheet"href="https://fonts.googleapis.com/icon?family=Material
+Icons">

<linkrel="stylesheet"href="https://maxcdn.bootstrapcdn.com/fontawesome/4.
7.0/css/font-awesome.min.css"> -->
  <div class="layout">
     <main class="content">
       <div class="main-header">
         <div class="main-title">
            <div class="img" >
          <img  src="../../assets/images/logo1.png"  >
         </div>
          <h1><p class="log" style="text-align: center; ">LOGIN</p></h1>
        </div>
        <div class="main-form">
        <form>
         <div class="form">
          <div class="card crd">
            <div class="div">
```

```
            <label for="fallday" class="label">USERNAME</label>
 <inputtype="text"id="username" class="username" placeholder="username">

<!<div*ngIf="requiredForm.controls['username'].invalid&&requiredForm.co
ntrols['username'].touched" class="alert alert-danger">
              <div *ngIf="requiredForm.controls['username'].errors.required">
              Name is required.
            </div>
            </div> -->
            <!-- <span class="empty_username" style="color: #4172f5aa;
display:none;">Username Required</span> -->

            </div>
           <div class="div">
<label for="fallday" class="label">PASSWORD</label>
<input type="password"id="password"placeholder="password"
<!--<spanclass="empty_password"style="color:#4172f5aa;
display:none;">Password Required</span>
 <span class="wrong_unpw"  style="color: #4172f5aa; display:none;">Invalid
Username or Password</span> -->
            </div>
          </div>
 <button type="submit"  value="Save" style="background-color: #4172f5aa;"
class="buttona" (click)="loginvalidation()">LOGIN</button>

         <!-- <div class="popup" onclick="myFunction()">Click me!
          <span class="popuptext" id="myPopup">Popup text...</span>
        </div> --
          </div>
        </form>
        </div>
```

```
        </div>
      </main>
    </div>
    </ion-content>
<ion-header [translucent]="true">
  <ion-toolbar>
    <ion-title>
      Blank
    </ion-title>
  </ion-toolbar>
</ion-header>

<ion-content [fullscreen]="true">
  <ion-header collapse="condense">
    <ion-toolbar>
      <ion-title size="large">Blank</ion-title>
    </ion-toolbar>
  </ion-header>

  <div id="container">
    <strong>Ready to create an app?</strong>
    <p>Start with Ionic <a target="_blank" rel="noopener noreferrer"
href="https://ionicframework.com/docs/components">UI
Components</a></p>
  </div>
</ion-content>

    <div class="layout">

       <div class="table-title">
      <div class="row">
```

```
  <divclass="col-sm-8"><h2><b><style="color:#3ba8d4">Customer Details</p></b></h2></div>


            <div class="col-sm-4">
 <!-- <button type="button" class="addnew" style="color:#3ba8d4">ADD NEW</button> -->
<buttonstyle="fontsize:24px"style="color:#3ba8d4;"(click)="mpage.loadcomponents(0,'new',")">ADD<ion-iconstyle="color:#3ba8d4;font-size:20px"name="add-circle sharp">
</ion-icon>
</button>
                <div class="search-box">
                   <input type="text" class="form-control" id="user_search" [(ngModel)]="cp.search_customer" placeholder="Search&hellip;">
                </div>
             </div>
          </div>
       </div>
     <div class="container-xl desktop">
       <div class="table-responsive">
          <div class="table-wrapper">

             <table id="customer_table" class=" table table-striped table-hover table-bordered">
                <thead>
                   <tr>
                      <th>S.No</th>
                      <th>Name</th>
                      <th>Address</th>
                      <th>Phone Number</th>
```

```
                    <th>E-Mail</th>

                    <th>Actions</th>
                  </tr>
                </thead>
                <tbody>

<tr*ngFor="letcustomerofcp.all_customerfilter:cp.search_customer    ;let  i  =
index ">
                    <td>{{ i+1 }}</td>
                    <td>{{ customer.cust_name | titlecase }}</td>
                    <td>{{ customer.address }} </td>
                    <td>{{ customer.phnumber1 }}</td>
                    <td>{{ customer.email }}</td>
                    <td>
 <a  href="javascript:void(0);"  (click)="edit_use_cust(i,'view')"  class="view"
title="View" data-toggle="tooltip">
<ion-icon name="eye-sharp"></ion-icon>
</a>
<!--
<ahref="javascript:void(0);"(click)="edit_use_cust(i,")"class="edit"title="Edit
"data-toggle="tooltip">
<ion-iconname="create-sharp">
</ion-icon>
                      </a> -->
 <!--<ahref="javascript:void(0);"(click)="cp.delete_user(i)"class="delete"
title="Delete"data-toggle="tooltip">
<ion-icon name="trash-sharp">
</ion-icon>
                      </a> -->
                  </td>
```

```
                </tr>
                    </tbody>
            </table>
          </div>
        </div>
    </div>
    </div>
    <ion-list class="mobile">
        <ion-item*ngFor="letcustomerofcp.all_customer                    |
filter:cp.search_customer  ;let i = index">
          <ion-avatar slot="start"  >
            <img [src]="customer.profilephoto" style="zoom:3"/>
          </ion-avatar>
          <ion-avatar slot="end"  >
            <ion-iconcolor="success"(click)="edit_use_cust(i,'view')"
name="arrow-forward-circle-sharp" style="zoom:2;">
</ion-icon>

          </ion-avatar>
          <ion-label>
            <h2>{{ customer.cust_name | titlecase }} </h2>
            <!-- <h3>{{ customer.email }}</h3> -->
            <h3>{{ customer.phnumber1 }}</h3>
            <p style="display: none;">
              <ion-button color="success" (click)="edit_use_cust(i,'view')">
                <ion-icon name="arrow-forward-circle-sharp" ></ion-icon>
                View
              </ion-button>
              <ion-button color="primary" (click)="edit_use_cust(i,')">
                <ion-icon name="create-sharp">
</ion-icon>
```

```
                Edit
              </ion-button>
              <ion-button color="danger" (click)="cp.delete_user(i)">
                <ion-icon name="trash-sharp">
</ion-icon>
                Delete
              </ion-button>
 <!--<ahref="javascript:void(0);"(click)="edit_use_cust(i,'view')"class="view"
title="View" data-toggle="tooltip">
<ion-icon name="eye-sharp">
</ion-icon>
<ahref="javascript:void(0);"(click)="edit_use_cust(i,")"class="edit"title="Edit
"data-toggle="tooltip">
<ion-icon name="create-sharp">
</ion-icon>
              </a>
<ahref="javascript:void(0);"(click)="cp.delete_user(i)"class="delete"
title="Delete"data-toggle="tooltip">
<ion-icon name="trash-sharp">
</ion-icon>
              </a>-->
            </p>
          </ion-label>
        </ion-item>
    </ion-list>

    <!—
<linkrel="stylesheet"href="https://fonts.googleapis.com/css?family=Roboto">
<linkrel="stylesheet"href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.0
/css/bootstrap.min.css">
```

```
<linkrel="stylesheet"href="https://fonts.googleapis.com/icon?family=Material
+Icons">
 <linkrel="stylesheet"href="https://maxcdn.bootstrapcdn.com/font-
awesome/4.7.0/css/font-awesome.min.css"> -->
    <div class="layout">
      <main class="content">
        <div class="main-header">
          <div class="main-title">
            <h1>{{ cp.loan_type }} LOAN</h1>
          </div>
          <div class="main-form">
           <div class="form">
              <div class="div">

                <label for="fallday" class="label">Loan Number</label>

<inputtype="number"class="ln"id="loan_no"[(ngModel)]="cp.new_loan.loan
_number"placeholder="Enter Loan Number">
  <spanclass="em_loan"style="color:red; display:none;">*Required</span>
              </div>

              <div class="div">

                <label for="fallday" class="label">Customer</label>
                <select(change)="customer_change()"
[(ngModel)]="cp.new_loan.customer" class="customer ln he" id="lcustomer"
placeholder="select customer">
                  <option   disabled selected hidden>Select Customer</option>
                  <option *ngFor="let cust of cp.all_customer;let i = index"
[value]="cust.cust_id" [attr.index]="i">{{ cust.cust_name }}</option>
                </select>
```

```
 <spanclass="em_customer"style="color:red;display:none;">
*Required</span>
            </div>
            <div class="div">
              <label for="fallday"  class="label">Addresss</label>
 <inputtype="text"[(ngModel)]="cp.new_loan.address"class="lnhe"id="
address" >
            </div>
            <div class="div">
              <label for="fallday"  class="label">City</label>
              <input type="text" [(ngModel)]="cp.new_loan.city"  class="ln he"
id="city" >
          </div>
          <div class="div">

              <label for="fallday"  class="label">Pincode</label>
              <input     type="number"     [(ngModel)]="cp.new_loan.pincode"
min="0"  class="ln he" id="pincode">
          </div>

          <div class="div">
              <label for="fallday"  class="label">Aadhar No</label>
              <input  type="text"  [(ngModel)]="cp.new_loan.aadhar"  min="0"
class="ln he" id="aadhar">
          </div>

            <div class="div">
<label for="fallday" class="label">Phone Number</label>
<inputtype="number" [(ngModel)]="cp.new_loan.phone_no" maxlength="10"
min="0"  class="ln he" id="phone" placeholder="Enter PhoneNumber">
            </div>
```

```
                <div class="div">

 <labelfor="fallday"class="label">LoanDate</label>
<inputtype="date"[(ngModel)]="cp.new_loan.loan_date"class="ln"
id="ldate">
 <span class="em_ldate"  style="color: red; display:none;">*Required</span>
                </div>
                <div class="div">
                   <label for="fallday" class="label">Due Date</label>
<inputtype="date"[(ngModel)]="cp.new_loan.due_date"class="ln"id="ddate>
 <spanclass="em_ddate"style="color:red; display:none;">*Required</span>
                </div>
                <div class="div">
 <label for="fallday" class="label">Auction Date</label>
<inputtype="date"[(ngModel)]="cp.new_loan.auction_date"class="ln"
id="adate">
  <spanclass="em_adate"style="color: red; display:none;">*Required</span>
                </div>
                <div class="div">
                   <label for="fallday" class="label">Loan Amount</label>
                   <inputtype="number"id="loanamt"
[(ngModel)]="cp.new_loan.loan_amount"min="0"class="ln"
placeholder="Enter Loan Amount">
                   <spanclass="em_loanamt"style="color:red;
display:none;">*Required</span>
                 </div>
                <div class="div">
  <label for="fallday" class="label">Interest(%)</label>
   <inputtype="number"id="interest"[(ngModel)]="cp.new_loan.interest"
min="0" class="ln" placeholder="Enter Interest">
  <spanclass="em_interest"style="color:red;display:none;">*Required</span>
```

```
                </div>
                  <div class="div">
                  <label for="fallday" class="label">Bank Loan No</label>
<inputtype="number"id="bankloanno"[(ngModel)]="cp.new_loan.bankloann
o" min="0" class="ln" placeholder="Enter Bank Loan No">
                </div>

                 <div class="div">
                  <label for="fallday" class="label">Bank Name</label>
   <inputtype="text"id="bankname"[(ngModel)]="cp.new_loan.bankname"
class="ln" placeholder="Enter Bank Name">
                </div>
                 <div class="div">
                  <label for="fallday" class="label">Branch Name</label>
<inputtype="text"id="branchname"[(ngModel)]="cp.new_loan.bankbrachnam
e" class="ln" placeholder="Enter Branch Name">
                </div>
                 <div class="div">
                  <label for="fallday" class="label">Bank Loan Date</label>
                  <input type="date"  [(ngModel)]="cp.new_loan.bank_loan_date"
class="ln" >
                </div>
                 <div class="div">
                  <label for="fallday" class="label">Bank Due Date</label>
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class="ln" >
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  <div class="row">
 <!--<inputtype="submit"style="backgroundcolor:#4172f5aa;color:white"
id="fsubmit"class="bt"value="Edit" (click)="edit_use_cust()" class="button">
```

```
<inputtype="submit"style="background-color:#4172f5aa;color:white"
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"> -->

<!--<inputtype="submit"style="background-color:#4172f5aa;color:white"
id="lsubmit"(click)="edit_use_cust('submit')"class="submit"value="SUBMIT
"  class="button"> -->
<ion-buttonstyle="margin-left:0px"class="submit"id="lsubmit"
(click)="edit_use_cust('submit')"color="primary">Submit
</ion-button>
<ionbuttonstyle="marginleft:0px"class="view"style="display:none"(click)="e
dit_use_cust('edit')"  color="primary">Edit
</ion-button>
 <ion-buttonstyle="margin-left:0px"class="view"style="display:none"
(click)="edit_use_cust('summary')"  color="primary">Summary
</ion-button>
<ion-buttonstyle="margin-left:5%"class="edit"style="display:none"
color="success"  (click)="edit_use_cust('update')">Update
</ion-button>

 <!--<ion-buttonstyle="margin-left:5%"class="edit"color="danger"
(click)="edit_use_cust('delete')"  >Delete
</ion-button> -->
<ion-buttonstyle="margin-left:5%"class="edit"style="display:none"
color="success" (click)="mpage.loadcomponents(5)">Cancel
</ion-button>
<ion-button style="margin-left:5%"    (click)="edit_use_cust('delete')" class="
edit"  style="display:none" color="danger" >Delete
</ion-button>

        </div>
```

```
          </div>
          </div>
        </div>
      </main>
    </div>
   <div class="layout" *ngIf="cp.new_loan.loan_id!="">
    <main class="content">
      <div class="main-header">
        <div class="main-title">

          <h1>JEWEL DETAILS</h1>
        </div>
        <div class="main-form">
         <div class="form">
            <div class="div">

  <labelfor="fallday"class="label">Description</label>
<inputtype="text"id="description"class="ln"[(ngModel)]="cp.new_jewel.desc
ription" placeholder="enter description"> <span class="em_des"  style="color:
red; display:none;">*Required</span>
            </div>
            <div class="div">
  <label for="fallday" class="label">Number Of Item</label>

<inputtype="number"id="noitem"class="ln"min="0"[(ngModel)]="cp.new_je
wel.items" placeholder="number of item">
<spanclass="em_noitem"style="color:red; display:none;">*Required</span>
            </div>
            <div class="div">
<labelfor="fallday"class="label">Gram</label>
<inputtype="number"id="gram"class="ln"min="0"[(ngModel)]="cp.new_jew
```

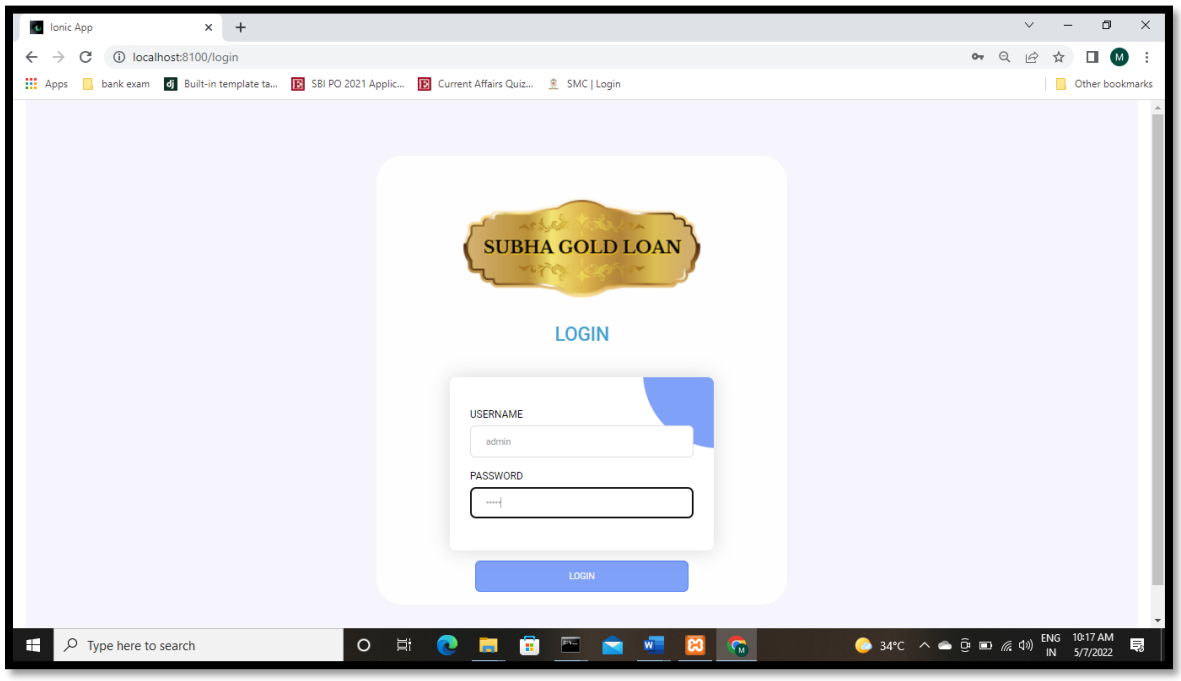
```
el.gram" placeholder="gram">
<spanclass="em_gram"style="color:red; display:none;">*Required</span>
            </div>
            <div class="div">
<label for="fallday" class="label">Value</label>
<inputtype="number”id="value"min="0"class="ln"[(ngModel)]="cp.new_jew
el.amount" placeholder="value">
<spanclass="em_value"style="color:red; display:none;">*Required</span>
            </div>

<inputtype="submit"style="backgroundcolor:#4172f5aa;color:white"
value="Save" (click)="cp.add_jewel()" class="button">
          </div>
        </div>
      </div>
    </main>
      </div>

    <!-- -->
    <div class="container-xl"  *ngIf="cp.new_loan.loan_id!="" >
      <div class="table-responsive">
        <div class="table-wrapper">
          <div class="table-title">
            <div class="row">
  <divclass="col-sm-8"><h2><b><pstyle="color:#3ba8d4">Jewel
Details</p></b></h2></div>
                <div class="col-sm-4">
                  <div class="search-box">
<inputtype="text"class="form-control" placeholder="Search&hellip;">
                  </div>
                </div>
```

```
    </div>
  </div>
  <table class="table table-striped table-hover table-bordered">
    <thead>
      <tr>
        <th>S.No</th>
        <th>Description<i class="fa fa-sort"></i></th>
        <th>Number of Item</th>
        <th>Gram<i class="fa fa-sort"></i></th>
        <th>Value</th>
        <th>action</th>

      </tr>
    </thead>
    <tbody>
      <tr *ngFor="let jewel of cp.all_jewel;let i=index;">
        <td>{{ i+1 }}</td>
        <td>{{ jewel.description }}</td>
        <td>{{ jewel.items }}</td>
        <td>{{ jewel.gram }}</td>
        <td>{{ jewel.amount  }}</td>
         <td>
           <!--<ahref="javascript:void(0);"class="view"
(click)="cp.view_jewel(i)"title="View"data-toggle="tooltip"><ion-icon
name="eye-sharp"></ion-icon></a> -->

<ahref="javascript:void(0);"class="editac"(click)="cp.view_jewel(i)"title="E
dit"data-toggle="tooltip"><ion-icon name="create-sharp"></ion-icon>
  </a>
<!--<ahref="javascript:void(0);"class="delete ac" (click)="cp.delete_jewel(i)"
title="Delete"data-toggle="tooltip"><ion-iconname="trash-sharp">
```

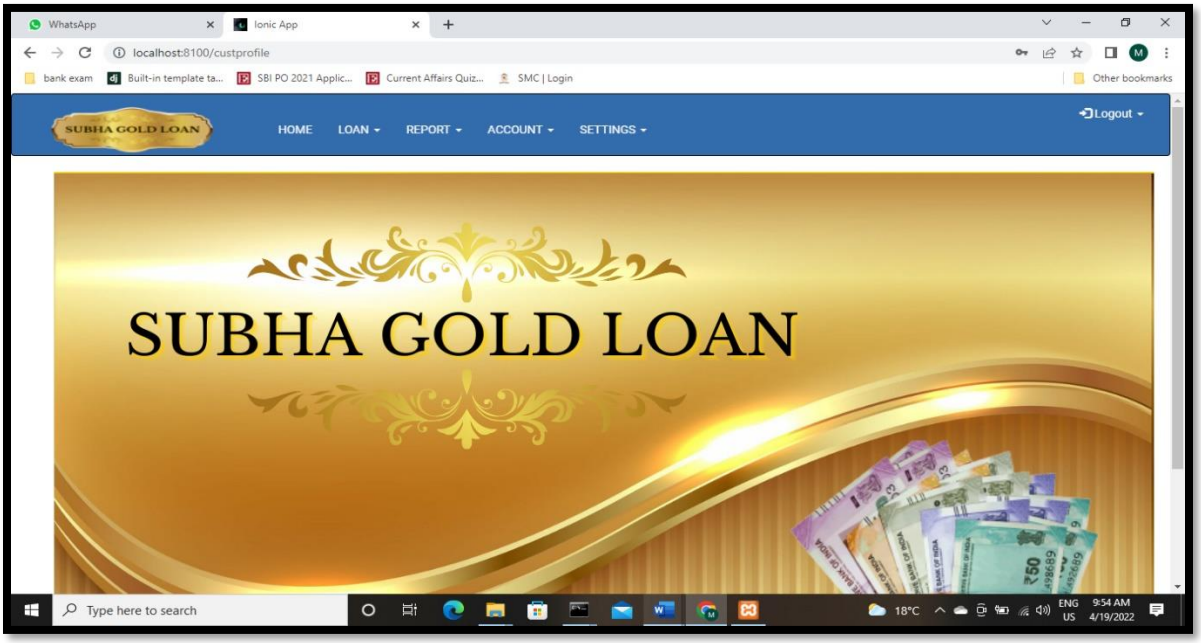
```
</ion-icon></a> -->
                        </td>
                    </tr>
                        </tbody>
                </table>
                <div class="clearfix">
                    <ul class="pagination">

<divclass="div"><labelclass="label">TotalAmount</label></div>
<!--<inputtype="number"class="lnta"[(ngModel)]="cp.jewell_total_amt"
id="total amount" placeholder="">-->
 <input type="number" class="ln ta" readonly [(ngModel)]="all_loan_amount"
id="total amount" placeholder="">
                    </ul>
                </div>
            </div>
        </div>
    </div>
```

8. SCREENSHOTS

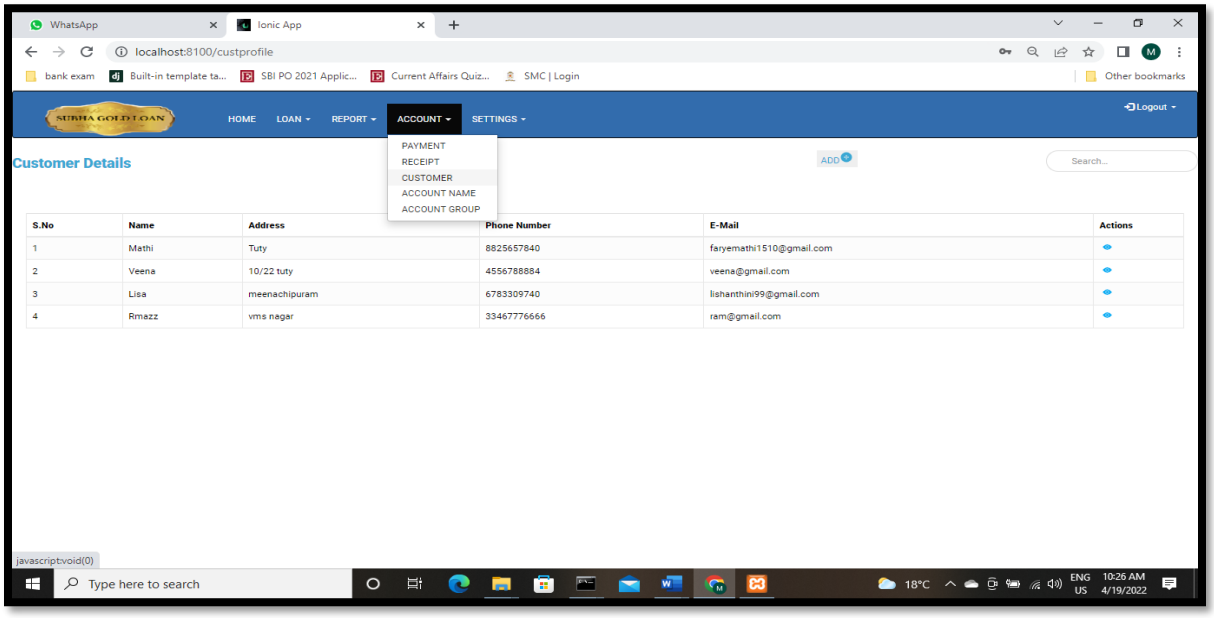
LOGIN PAGE



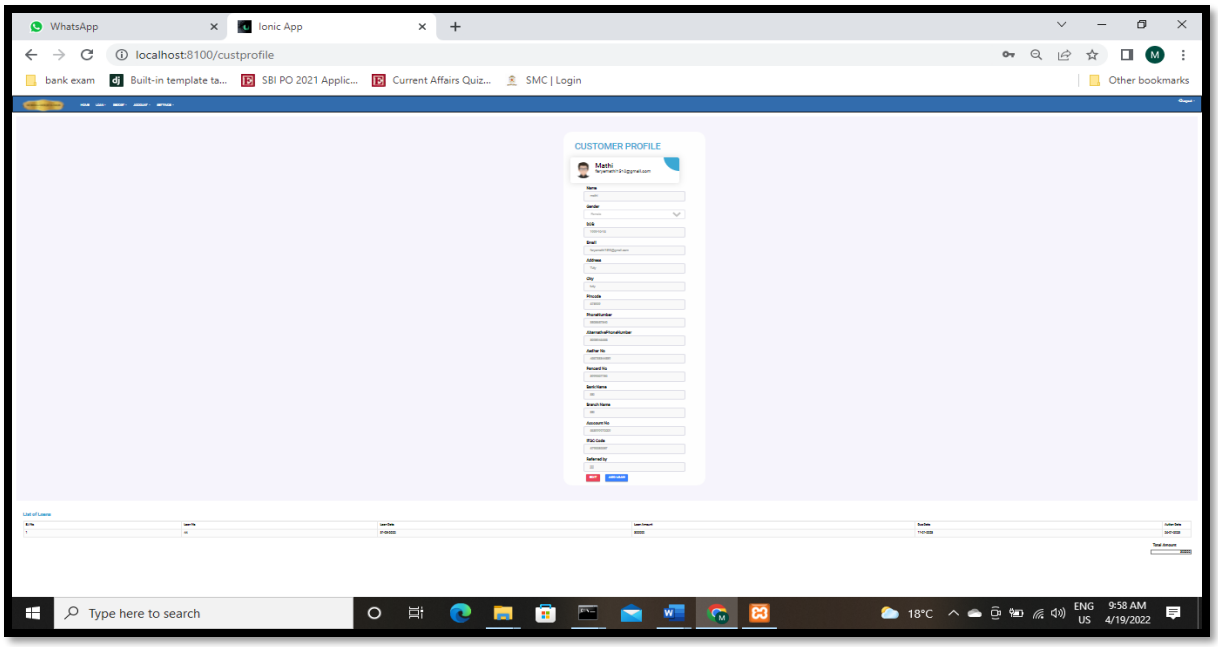
HOME PAGE



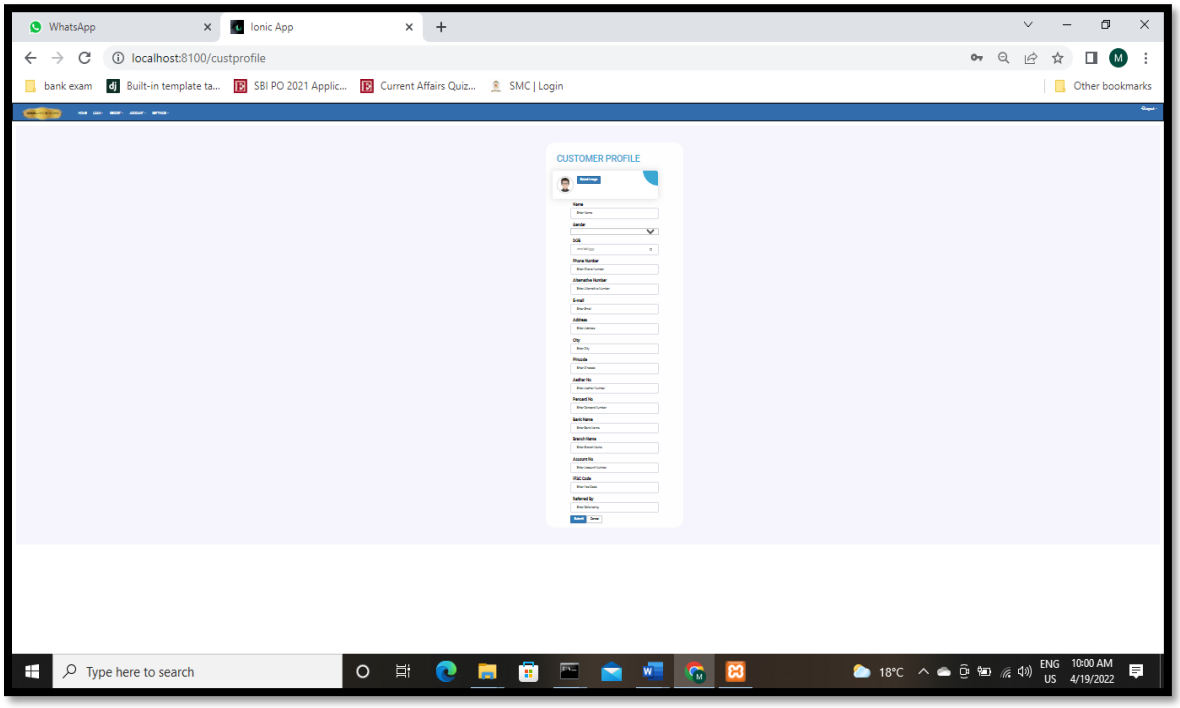
CUSTOMER DETAILS



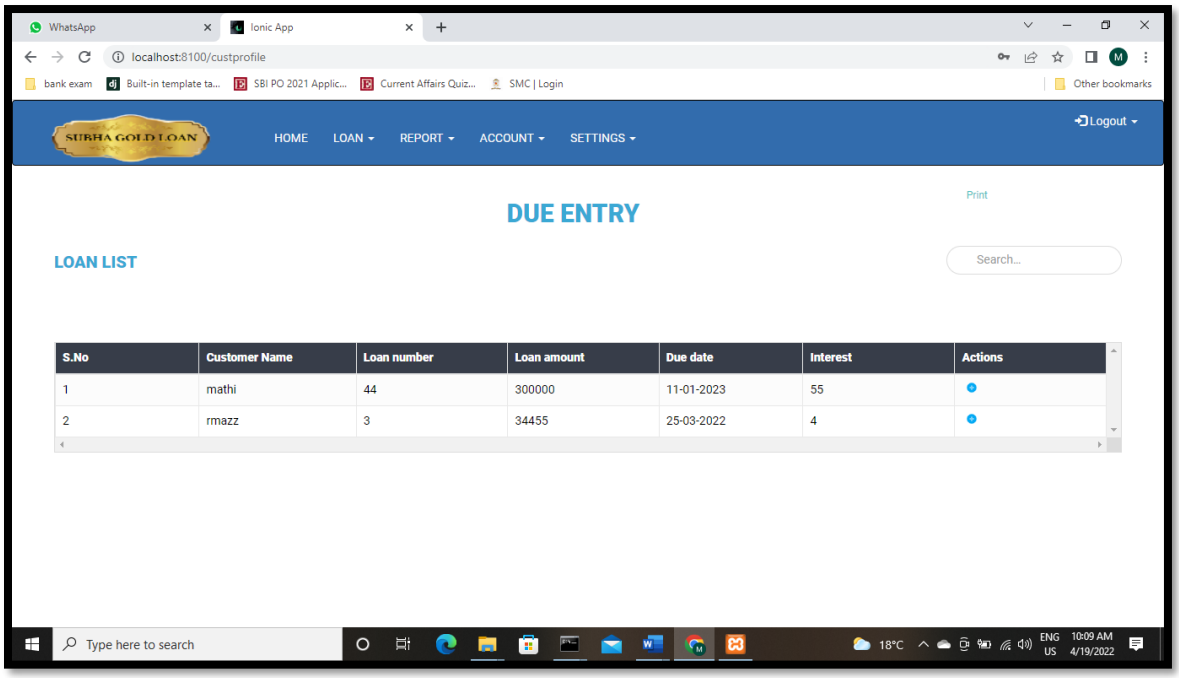
VIEW CUSTOMER DETALIS



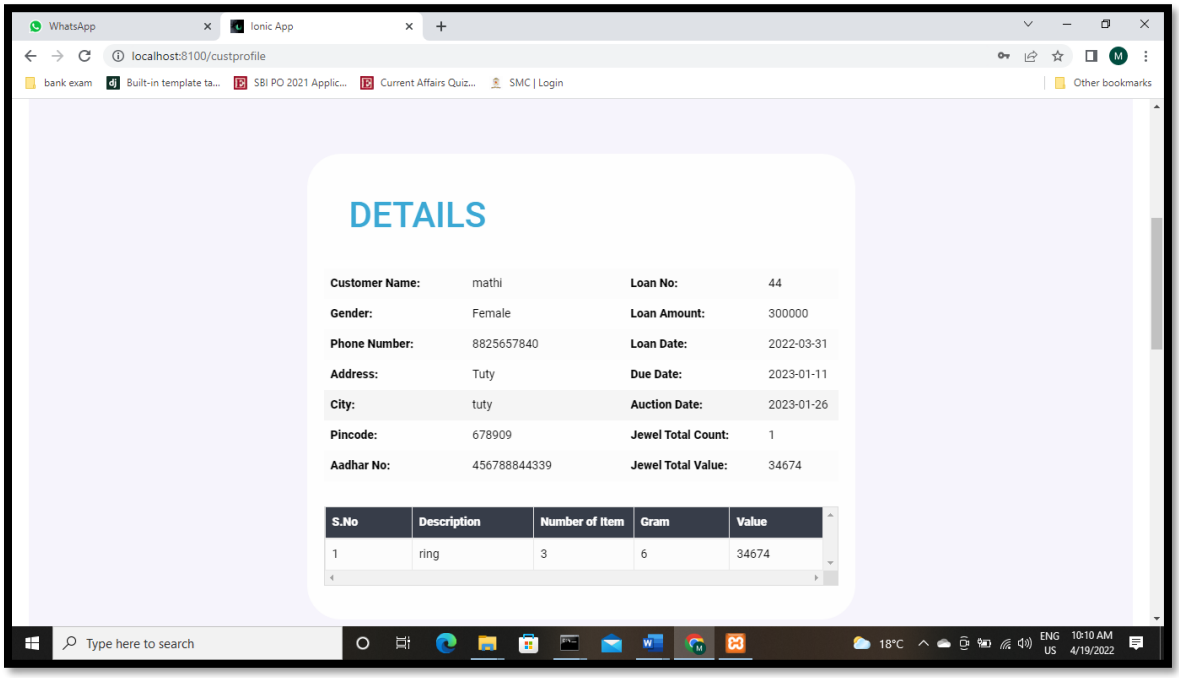
ADD NEW CUSTOMER PROFILE



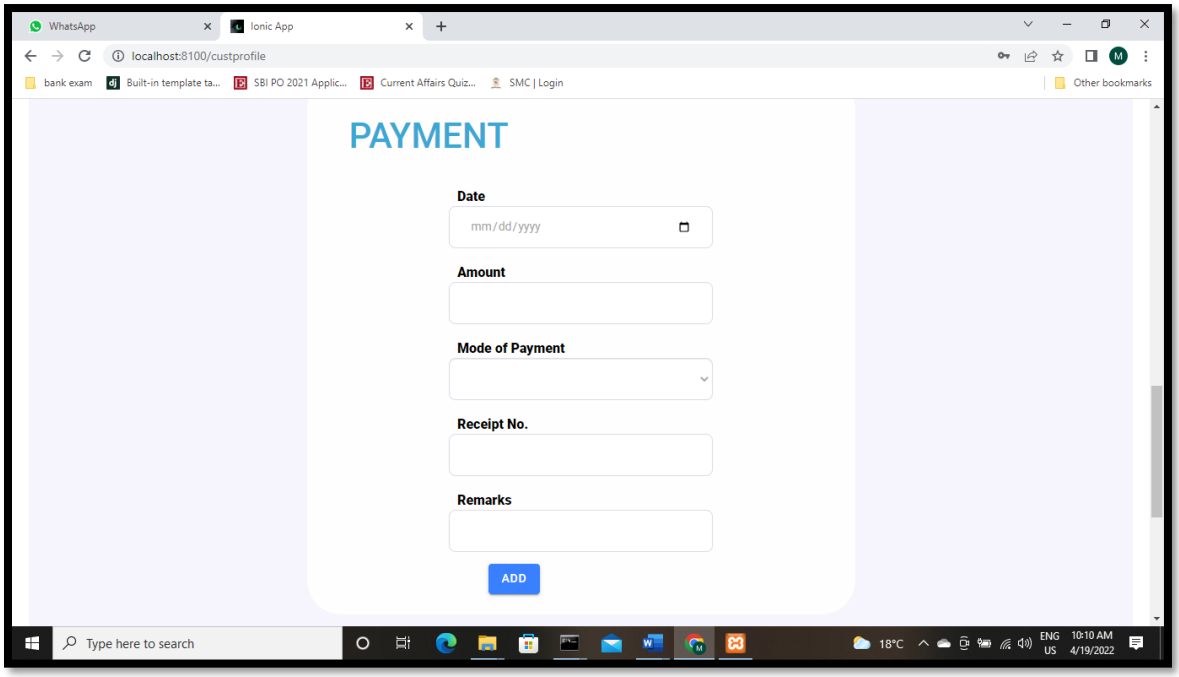
DUE ENTRY



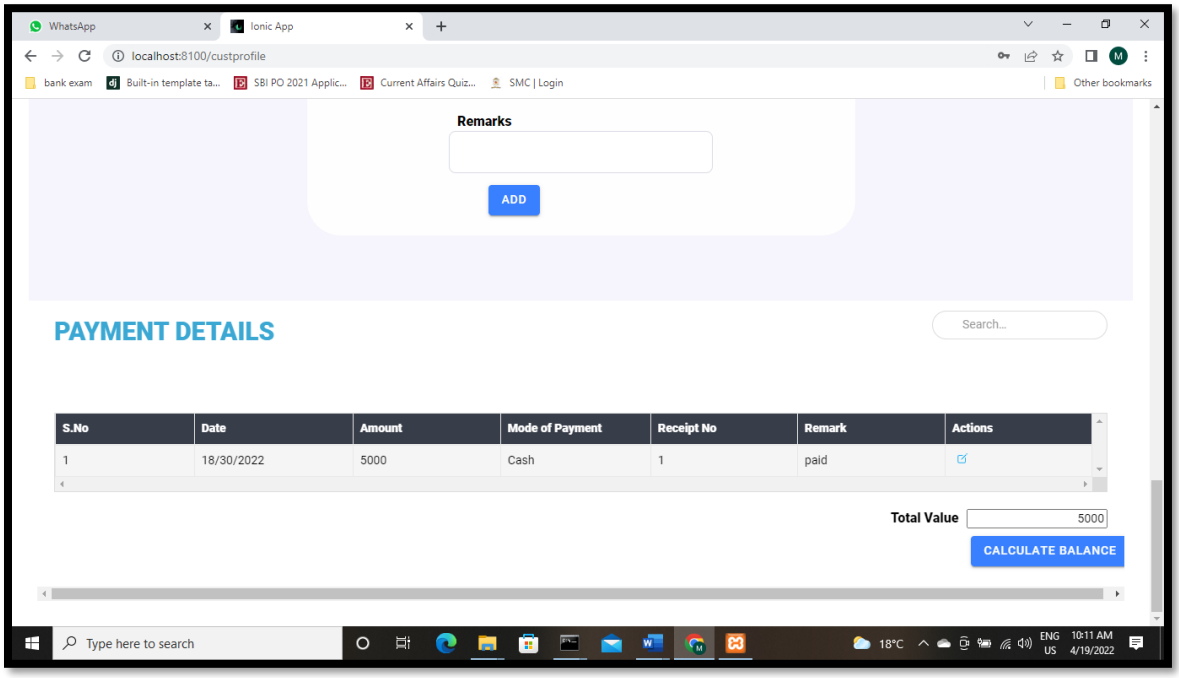
DUE ENTRY DETAILS



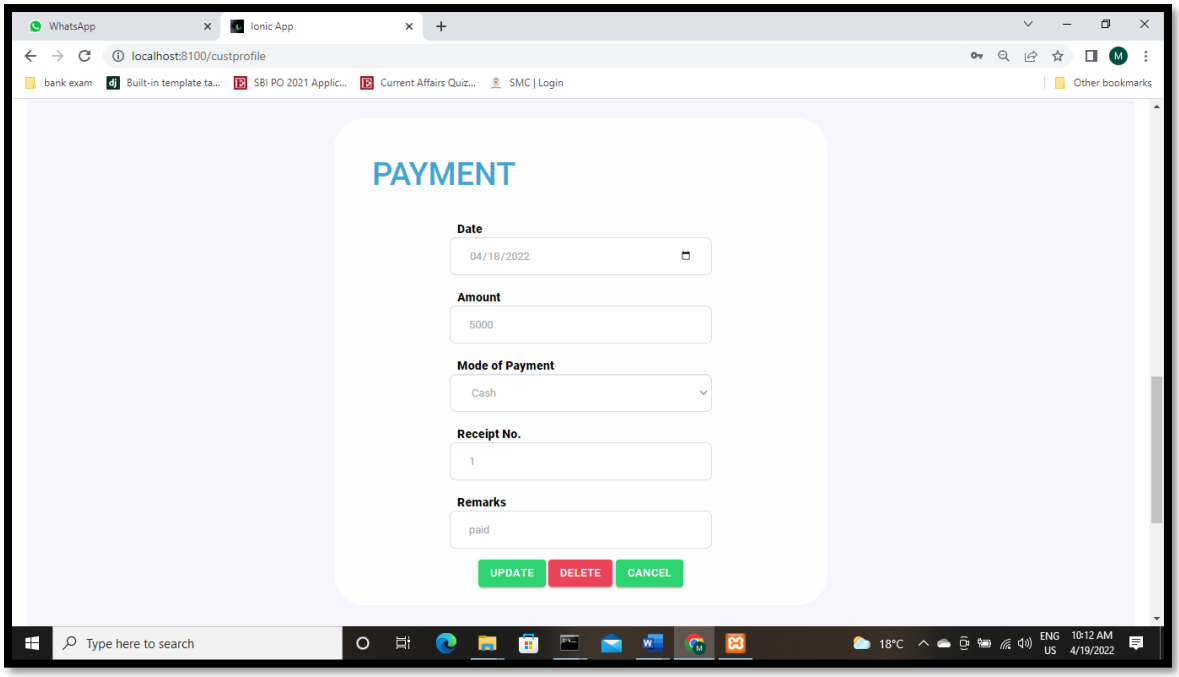
PAYMENT



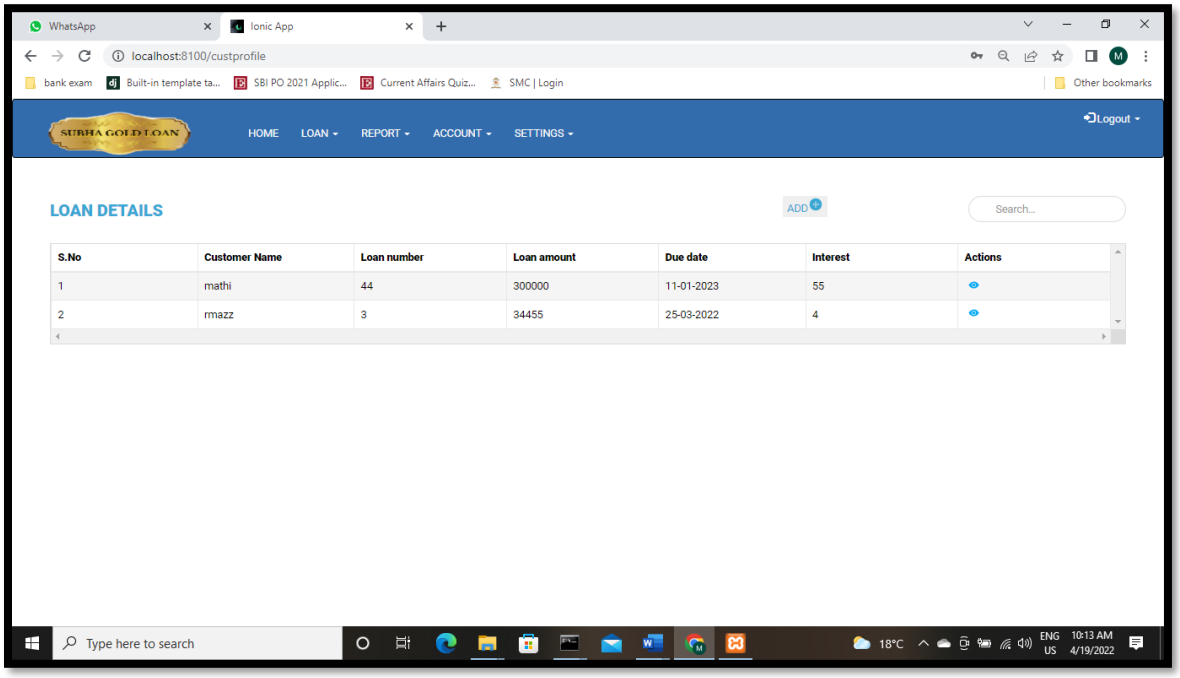
PAYMENT DETAILS



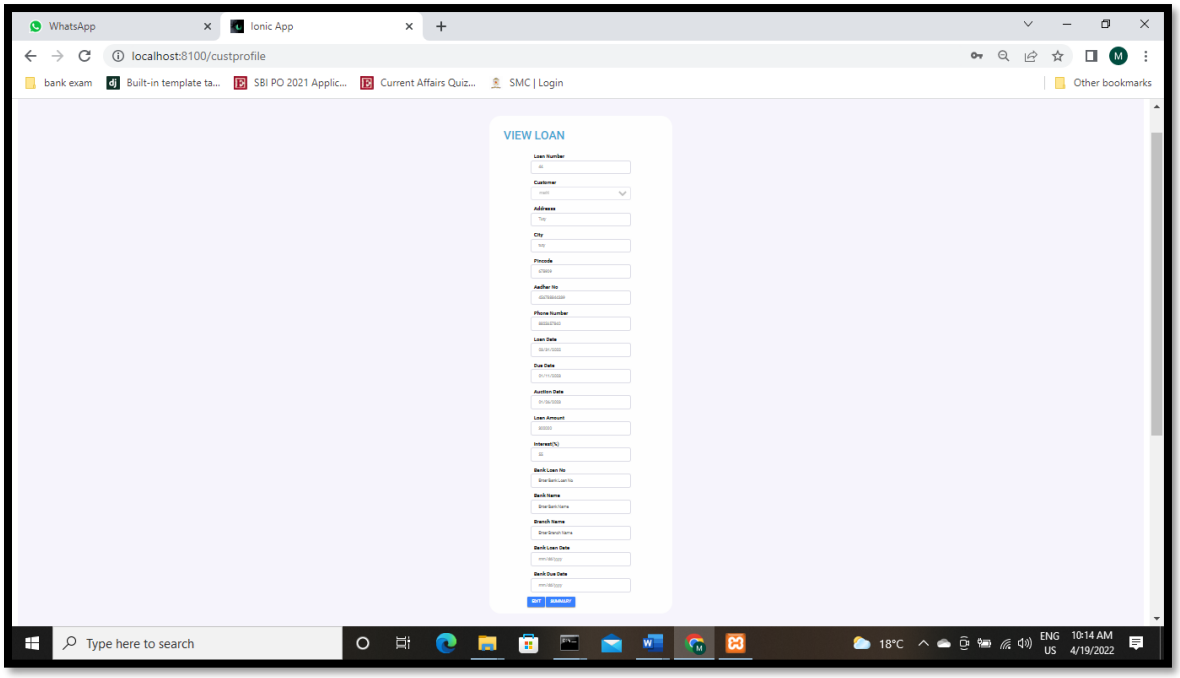
VIEW PAYMENT DETAILS



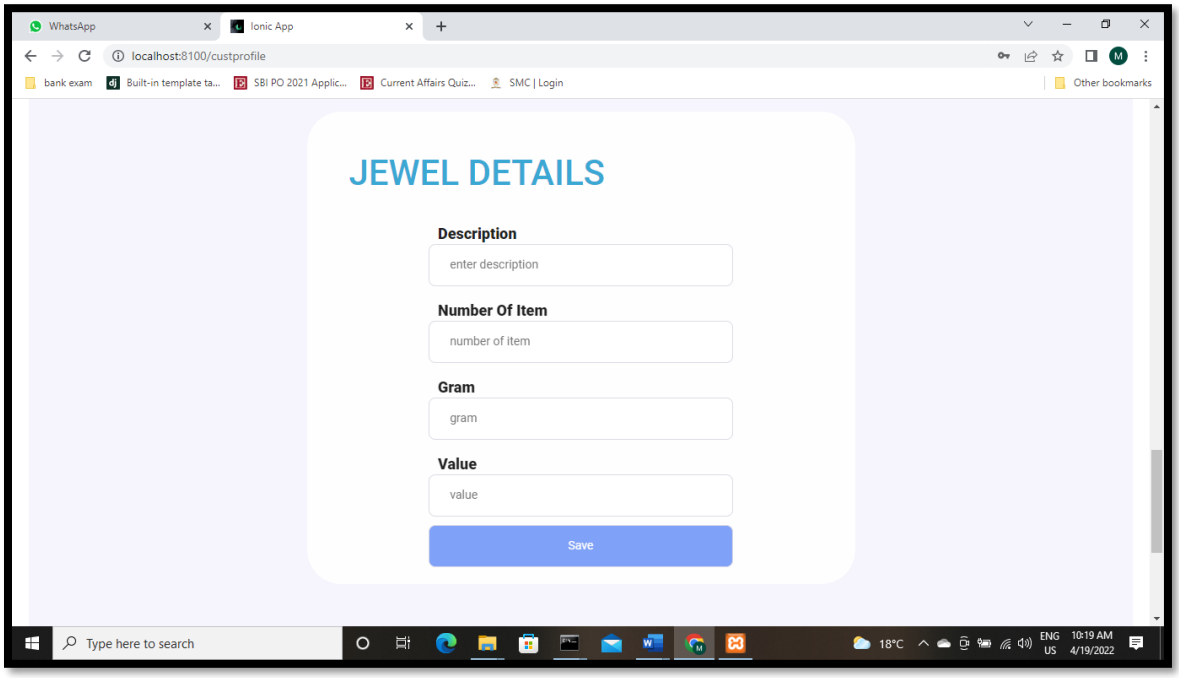
LOAN LIST DETAILS



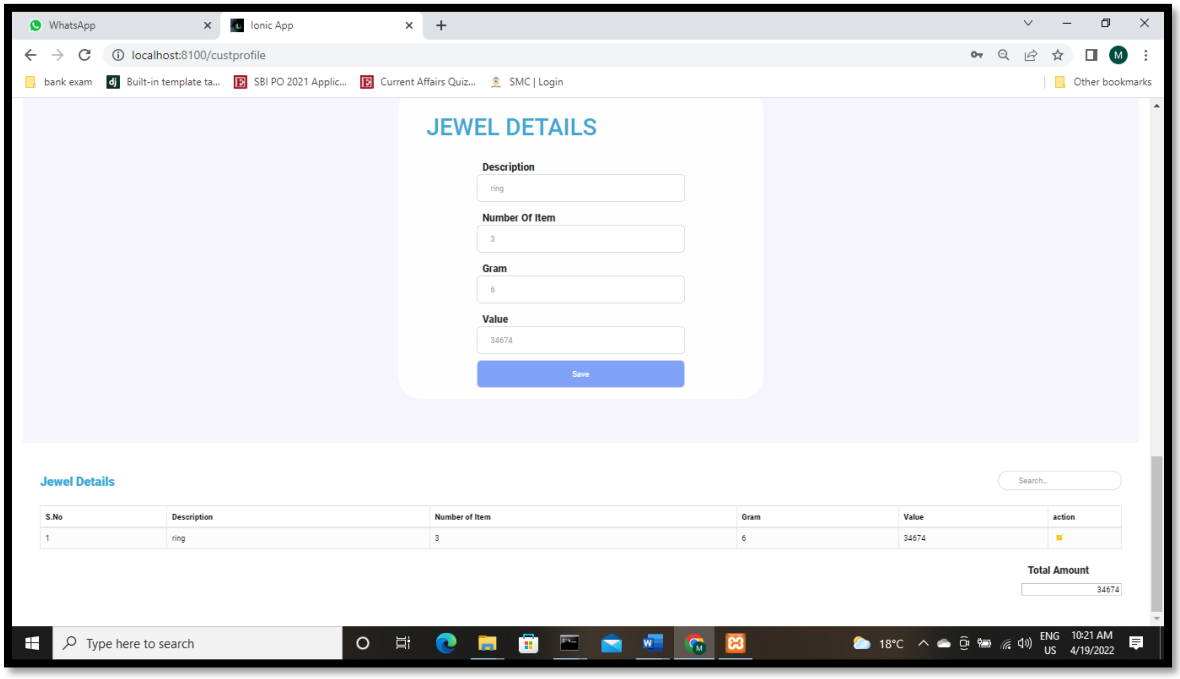
VIEW LOAN LISTDETAILS



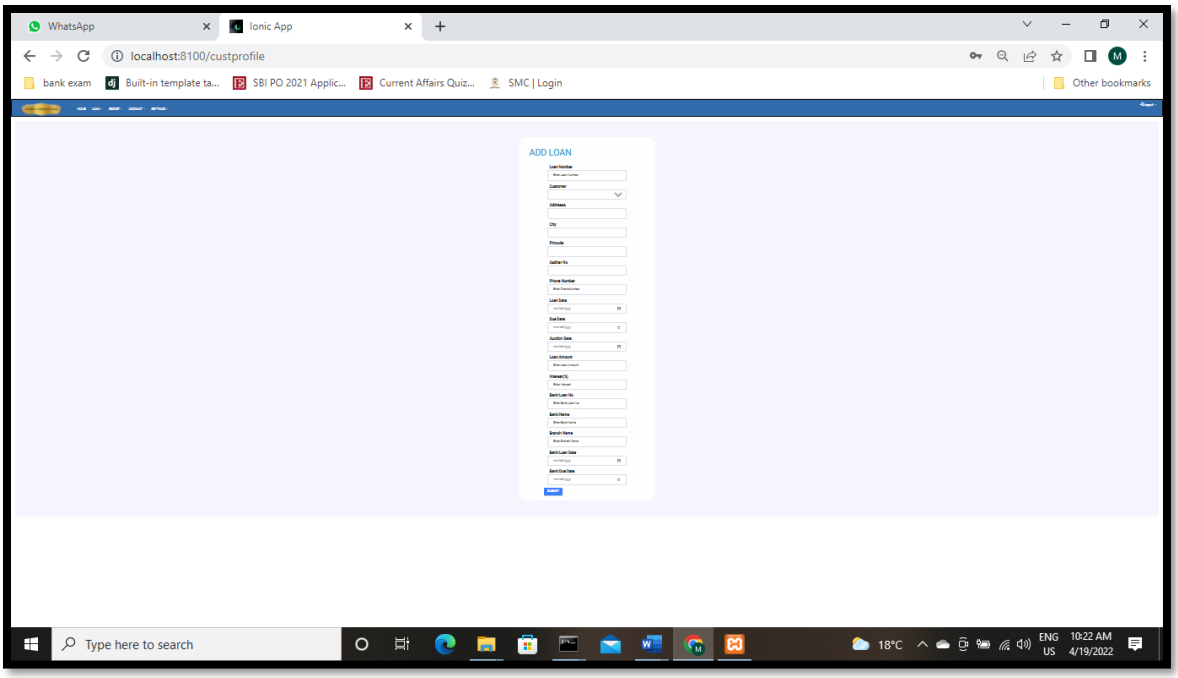
JEWEL DETAILS



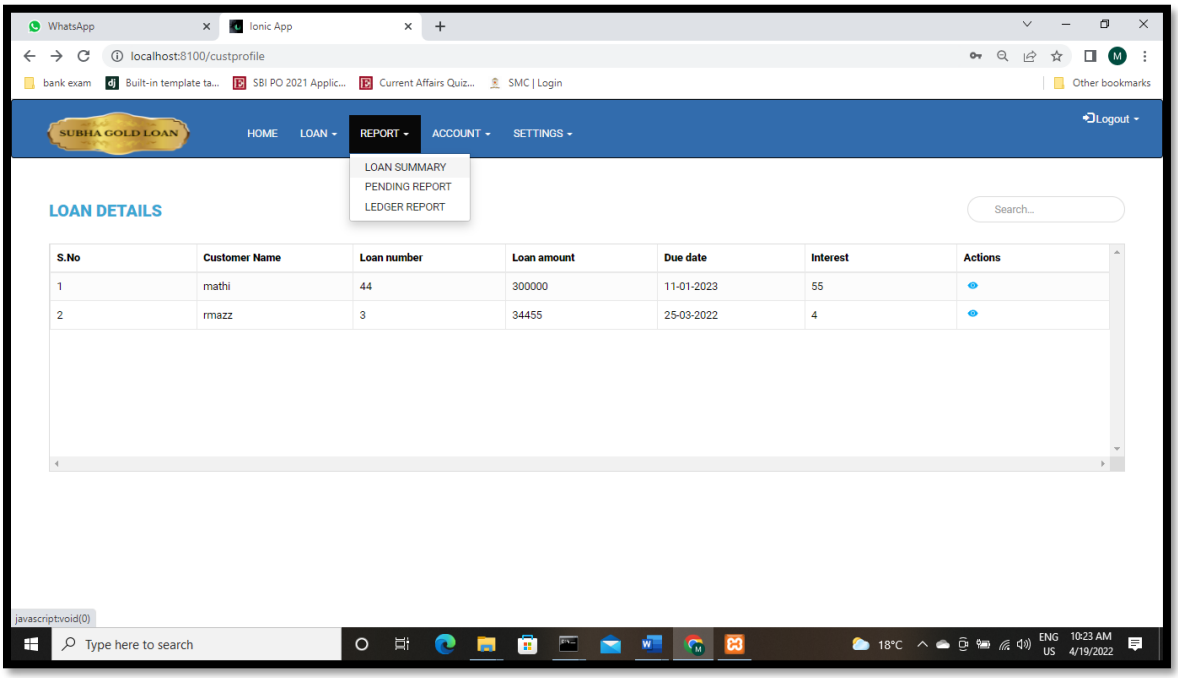
VIEW JEWEL DETAILS



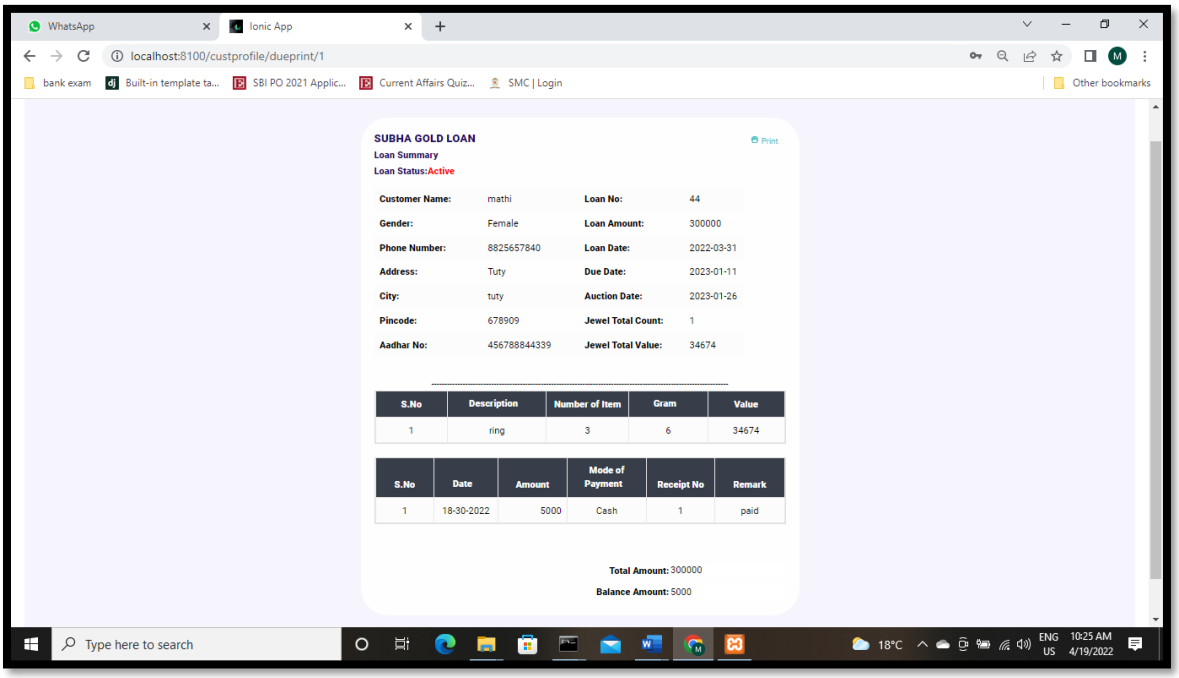
ADD LOAN



REPORT – LOAN SUMMARY



VIEW LOAN SUMMARY DETAILS



9. CONCLUSION

The outcome of this project provides a gold loan processing application that saves paper works throughout the life of the loan, and makes available its design, a guide or foundation towards creation of similar or improved systems. The gold Loan processing Application Software would help boost a lending institution's admin service in many ways, and make the loan processing operations more efficient and transparent. The computational speed, accuracy and storage capabilities of the computer would merge with the creativity and intuition of the human to make it all a success. Thus, the Gold loan processing system is developed and executed successfully.

10. FUTURE ENHANCEMENT

In future , gold loans even all vintage players offered the door step service to clients who are willing to avail average or big-ticket gold loans, it was made possible to meet the service needs, digital support and transactions control with available gazettes. Online Gold Loan has picked up well and customer could avail loan amount in his bank account over the click sitting at his house.

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INTERNET OF THINGS HUB

A project submitted to

ST. MARY'S COLLEGE (Autonomous), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

In partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

P. NANCY

Reg. No.: 20SPCS13

Under the Supervision and Guidance of

Dr. A. Vithya Vijayalakshmi MCA., M. Phil., Ph.D.,

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi-628001

MAY 2022

CERTIFICATE

This is to certify that this project work entitled "**INTERNET OF THINGS HUB"** is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to **Manonmaniam Sundaranar University, Tirunelveli,** in partial fulfillment for the award of the degree of Master of Science in **Computer Science** for the work done during the year 2021-2022 by **P. NANCY (Reg. No. : 20SPCS13)**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do here by declare that, the project entitled "**INTERNET OF THINGS HUB"** submitted for the degree of Master of Science in Computer Science is my original work carried out under the guidance of **Dr. A. Vithya Vijayalakshmi MCA, M.Phil., Ph.D.,** Assistant Professor, PG Department of Computer Science (SSC), St.Mary's College (Autonomous), Thoothukudi**.**

Station: Thoothukudi **Signature of the student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani , Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and SSC Coordinator, PG Department of Computer Science (SSC) for her support and counsel.

I express my hearty thanks to my guide Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC) for her Valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to Ms. A. Jenitta Jebamalar M.Sc. (IT), M.Sc. (CS), M.Phil., B.Ed., Assistant Professor, PG Department of Computer Science (SSC) for her encouragement and support.

I am much indebted to Mr. Saravanan Chandra Krishnan., CEO, TekSpear Soft for his untiring effort, immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

TEK SPEAR
SOLUTIONS MADE SIMPLE

17-05-2022

To

The Head of the Department

PG Department of Computer Science (SSC)

St. Mary's College (Autonomous)

Thoothukudi

Dear Madam,

Sub: Project Completion Certificate-Reg

On behalf of **TEKSPEAR SOLUTIONS,** We are pleasure to inform you that **Ms. P.NANCY,**

REG No: 20SPCS13 studying M.sc Computer Science Final year has been done the project work at our concern On **"Internet of Things Hub"** during the period from **Feburary 2022** to **May 2022.**

During this period, we noticed her to be diligent, sincere and hardworking and she accomplished her within stipulated deadline.

We wish her for all future endeavors.

TEKSPEAR SOLUTIONS
PROJECT DIRECTOR

(C.SARAVANAN) H.R

ABSTRACT

ABSTRACT

“INTERNET OF THINGS HUB” is a module in Remote Cares project which aims at monitoring patients using devices remotely. The most popular devices include Fora D40 G, Viaanix etc. It is designed in Visual Studio and Microsoft SQL. This module contains a Data and Inventory group. In the patient data, a list of patient’s details will be displayed, allowing us to create new patients. The inventory group includes carton, device, device transaction, and invoice and purchase order. The carton is a collection/box which contains exactly ten devices with displaying purchase order id for each device. The device menu shows the device ID with its belonging carton and we can create a new device by providing the new device ID, device type, IMEI, SIMID, and ICCID. The device transaction group is used to assign and unassigned devices for the patient created. Invoice menu used for importing devices to an enterprise and purchase order helps for purchasing new devices from an enterprise. The measure data provides readings and medication details of the patients, which is measured by the assigned device. It also includes a menu called unsolicited gateway data. This menu contains the readings taken by the patients using the devices at remote in an assorted format. This module greatly helps for the patients who are far from the clinic. Thus, the IOT hub acts as a central message hub for communication between different IOT applications and its attached devices.

TABLE OF CONTENT

CHAPTER NO.	CONTENTS	PAGE NO.
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3.	SYSTEM DESIGN	
4.	PROJECT DESCRIPTION	
5.	DATABASE DESCRIPTION	
6.	CODING	
7.	SCREENSHOTS	
8.	CONCLUSION	
9.	FUTURE ENHANCEMENT	
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INTRODUCTION

1. INTRODUCTION

Intelligent Healthcare Delivered from the Cloud

The patient care journey is traditionally a fragmented one, especially for more complex cases or chronic conditions that involve multiple healthcare providers and clinical specialists. As a result, a patient's critical health data may be stored and siloed across disparate IT systems or in outdated pen-and-paper systems.

RemoteCares was founded to solve this challenge. RemoteCares is transforming the healthcare space with its unified platform for health management, which collects and consolidates data from clinical management systems, medical devices, and patients in real time into a single view and protects it with modern encryption standards. It also provides intelligent healthcare, with built-in risk stratification tools, care plan templates, continuous monitoring of vitals, smart algorithms, and data analytics.

Real-Time Remote Consultation with Telehealth

One of the headline features of RemoteCares is its Telehealth platform, a highly popular video-conferencing solution that connects healthcare providers with patients to offer remote consultations—whether in one-on-one sessions or in conferences of up to 100 people.

Preventive services

Preventive care is care you receive to prevent illness, detect medical conditions, and keep you healthy. Medicare Part B covers many preventive services, such as screenings, vaccines, and counseling. RemoteCare's intuitive platform is a one-stop wellness program built to help practices get compliant, patients get the most out of proactive care, and practitioners get time back in their days to focus on connecting and providing excellent care. It's HIPAA compliant and covers more facets of Medicare preventive care than any other platform.

Our most popular software solutions allow practices to effectively manage these Medicare programs in their office with their staff. We'll provide the tools and training. You provide the clinical resources. Medicare Programs supported through our platform include:

- Chronic Care Management
- Remote Patient Monitoring
- Annual Wellness Visits

What is Remote Patient Monitoring?

Remote Patient Monitoring (RPM) or telehealth is a type of ambulatory healthcare system which enables patients and doctors to use IoT connected portable medical devices. These devices track vital information and analyze data in real-time to provide an effective healthcare service in a timely manner.

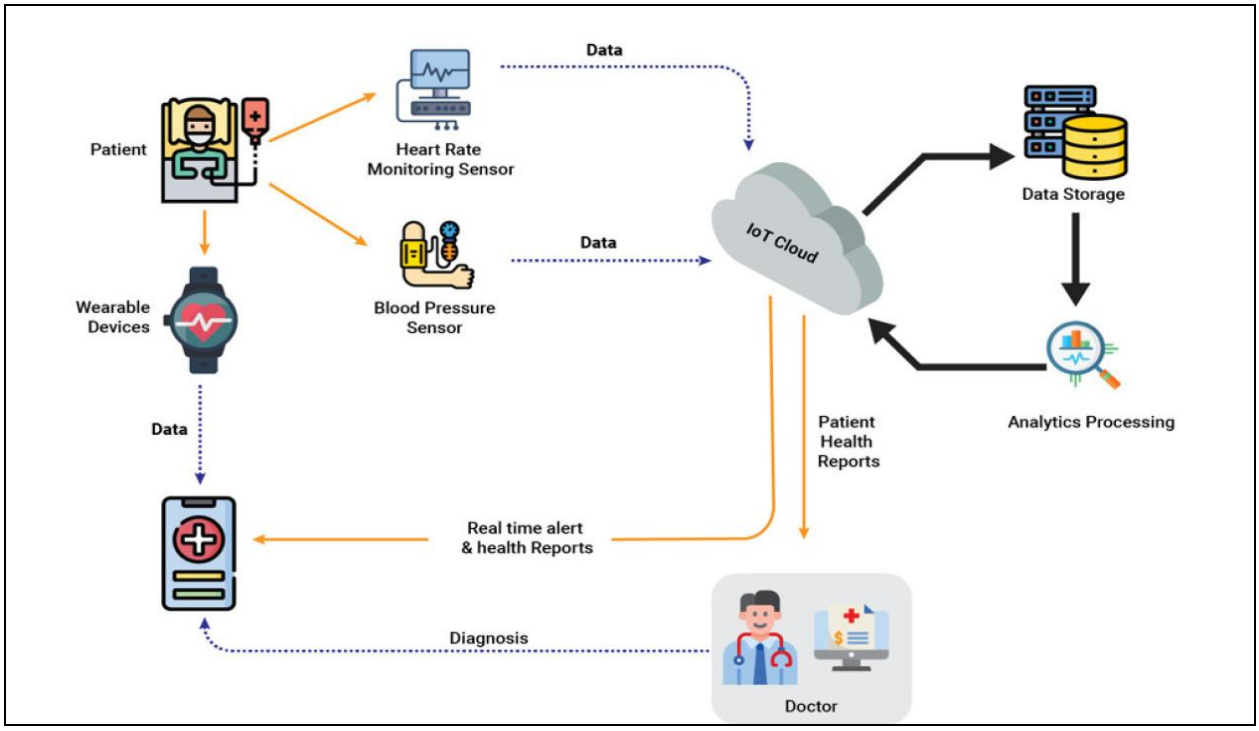
The most common and expensive health issue we are faced with are chronic diseases in the elderly. For example, the elderly are the most at risk in the case of cardiovascular diseases. According to the World Health Organization cardiovascular diseases are currently responsible for most deaths around the world. However, with telehealth technology solutions such diseases can be prevented or controlled effectively through appropriate management; hence, allowing people to lead healthy and quality lives.

Some of the constraints faced during long-term monitoring and management of health of elderly patients include limited budget, shortage of skilled healthcare personnel, and increasing healthcare costs. Therefore, a health monitoring system personalized for patient care and that is cost-effective and easily manageable is the order of the day. These monitoring systems are unobtrusive, affordable and holistic alternatives for effective healthcare management and monitoring for the needy.

What is RPM IOT Hub?

RPM IOT hub is the repository for the patient’s device readings. Remotecares medical IoT devices embed a global roaming IoT SIM card. They transmit direct-to-cloud anonymous device

readings over a secure, reliable and global M2M network. They feed device readings back to care teams - via Remotecares Hub - in any clinical system anywhere in the world. This eliminates the need for Bluetooth or Wi-Fi configuration by the patient. Furthermore, they provide biomedical engineers with device health information such as battery level or signal strength.



Advantages

Real-Time Visibility

Health care providers expect real-time visibility into medical information, including diagnostic data and patient records. Build your smart healthcare solutions with technologies that deliver the greatest medical IoT benefits to health care providers.

Improve Operational Efficiency

IoT empowers providers to offer new services and increase operational efficiency through remote health monitoring:

- Access real-time patient data to improve visibility and support

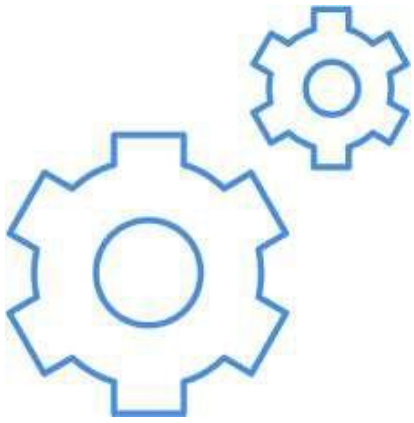
- Serve more patients by allowing some to return home to finish treatment and monitor them remotely
- Offer independent living solutions for the aging and disabled

Enhance Patient Experience

Remote health condition monitoring is changing how patients receive vital health care. Real-time tracking for vitals and other health statuses impacts patient outcomes and reduces costs:

- Providers can make smarter decisions about treatment to prevent emergencies and hospital readmissions
- Patients can extend care through at-home services, reducing hospital stay costs

SYSTEM SPECIFICATION



2. SYSTEM SPECIFICATION

PROJECT PROFILE

Project Title	:	**Internet Of Things Hub**
Organization	:	**TekSpear Soft**
Developed by	:	P. Nancy
Duration	:	14 February 2022
Internal Guide	:	Dr. A. Vithya Vijayalakshmi

PROJECT TOOLS

Front-end Tools	:	Visual Studio 2019
Back-end Tools	:	Microsoft SQL Server Management Studio
Web API	:	Rest API
Platform	:	Windows

SOFTWARE REQUIREMENTS

Operating System	:	Windows 10
Application Front-end Tools	:	UI
Database Back-end Tools	:	Entity Framework Core

INSTALLATION PROCEDURE:

Step 1 - Make sure your computer is ready for Visual Studio

Before you begin installing Visual Studio:

1. Check the system requirements. These requirements help you know whether your computer supports Visual Studio 2019.
2. Apply the latest Windows updates. These updates ensure that your computer has both the latest security updates and the required system components for Visual Studio.
3. Reboot. The reboot ensures that any pending installs or updates don't hinder your Visual Studio install.
4. Free up space. Remove unneeded files and applications from your system drive by, for example, running the Disk Cleanup app.

Step 2 - Download Visual Studio

Next, download the Visual Studio bootstrapper file.

To do so, choose the following button, choose the edition of Visual Studio that you want, choose **Save**, and then choose **Open folder**.

Download Visual Studio

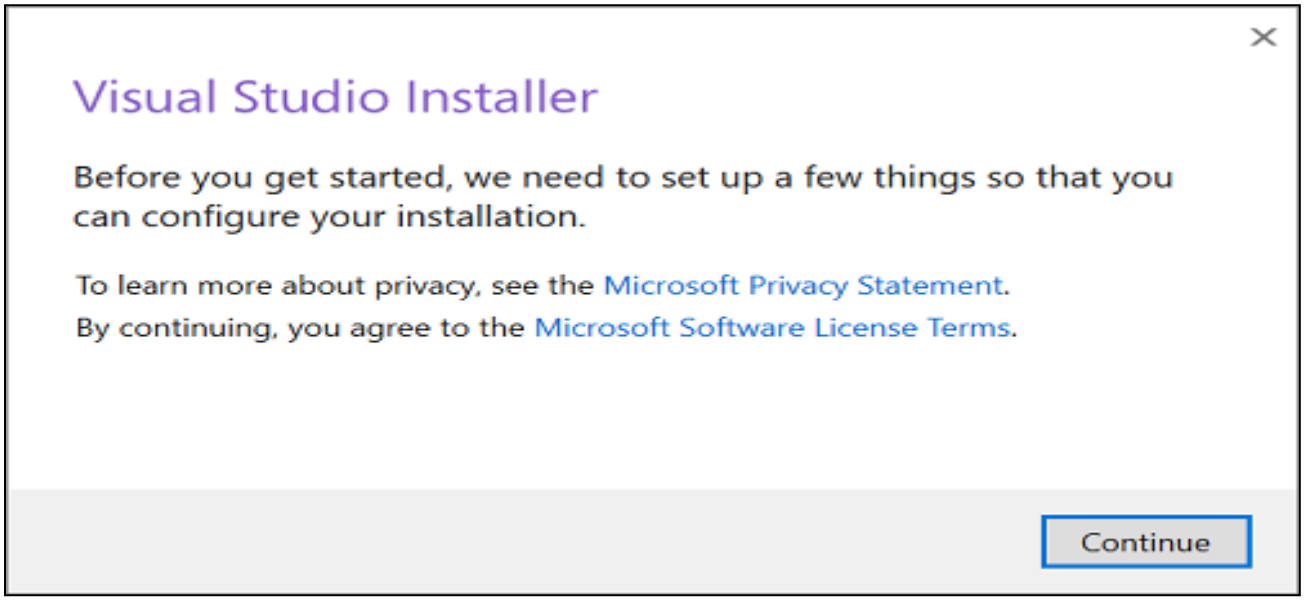
Step 3 - Install the Visual Studio Installer

Run the bootstrapper file to install the Visual Studio Installer. This new lightweight installer includes everything you need to both install and customize Visual Studio.

1. From your **Downloads** folder, double-click the bootstrapper that matches or is similar to one of the following files:
    - **vs_community.exe** for Visual Studio Community
    - **vs_professional.exe** for Visual Studio Professional
    - **vs_enterprise.exe** for Visual Studio Enterprise

If you receive a User Account Control notice, choose **Yes**.

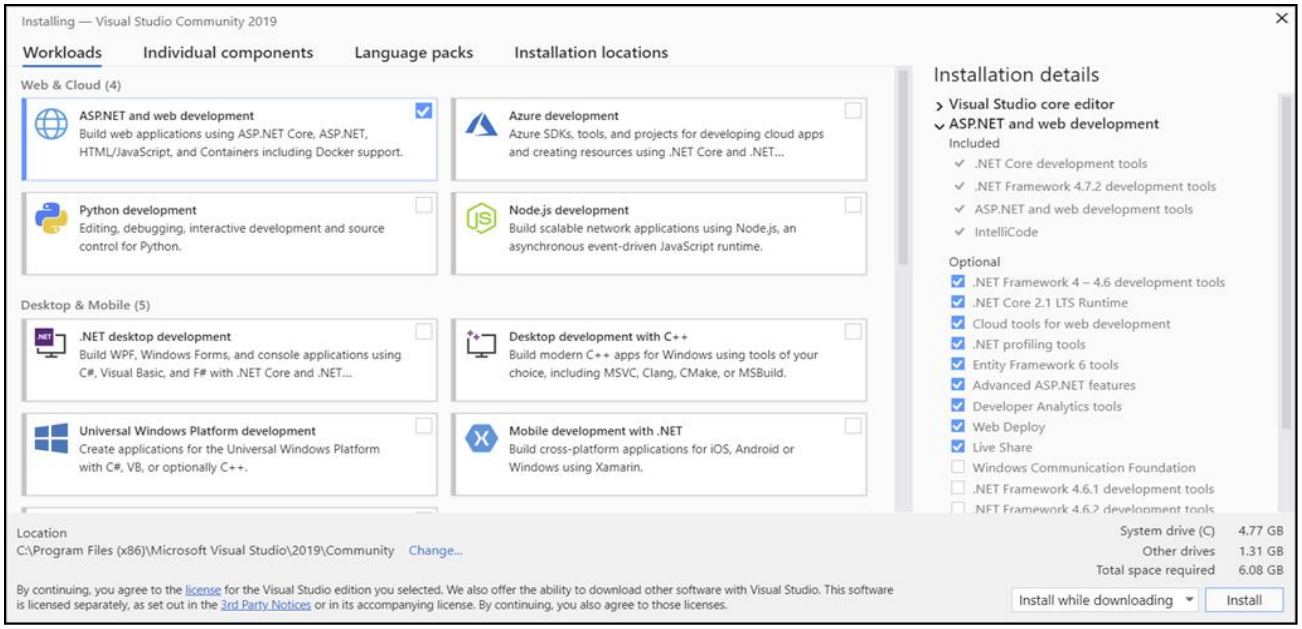
2. We'll ask you to acknowledge the Microsoft License Terms and the Microsoft Privacy Statement. Choose **Continue**.



Step 4 - Choose workloads

After the installer is installed, you can use it to customize your installation by selecting the feature sets—or workloads—that you want. Here's how.

1. Find the workload you want in the **Visual Studio Installer**.



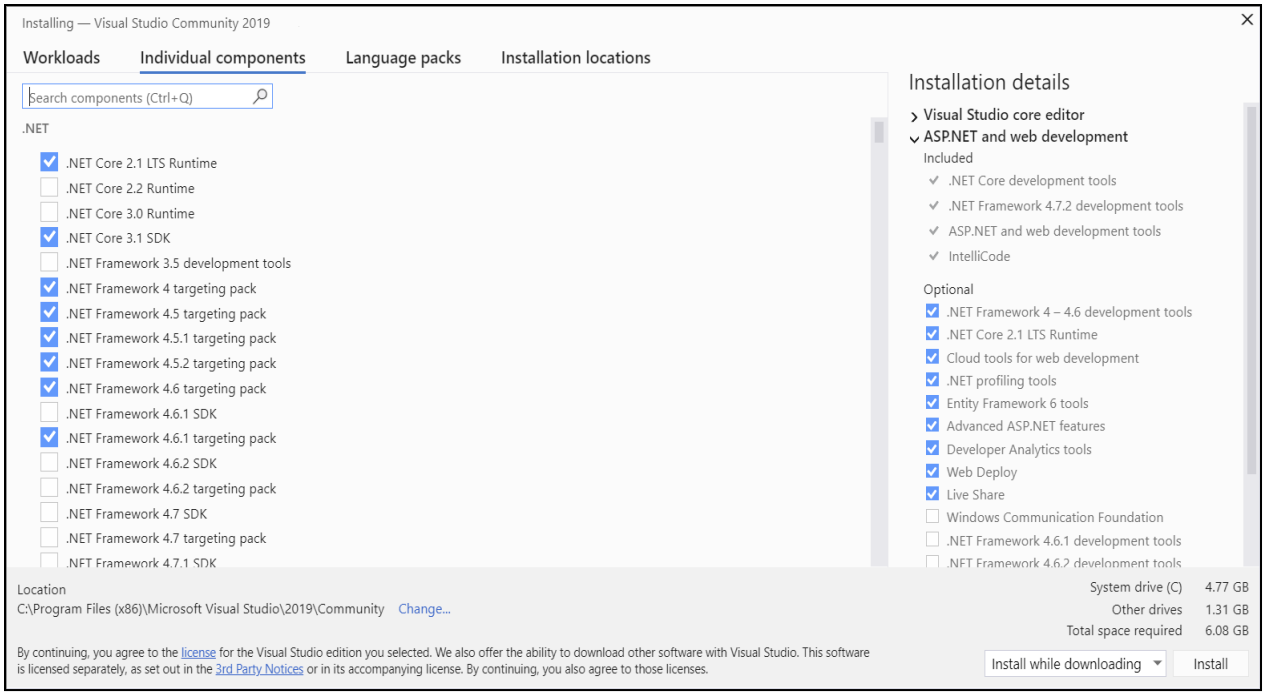
For example, choose the "ASP.NET and web development" workload. It comes with the default core editor, which includes basic code editing support for over 20 languages, the ability to open and edit code from any folder without requiring a project, and integrated source code control.

2. After you choose the workload(s) you want, choose **Install**.

Next, status screens appear that show the progress of your Visual Studio installation.

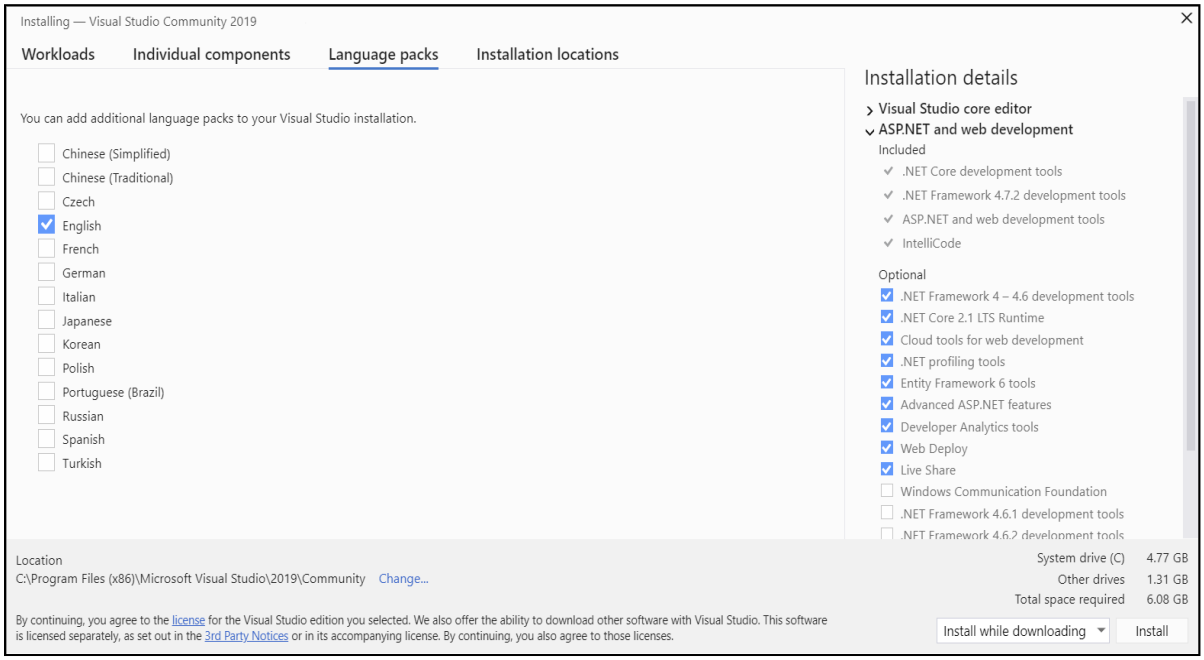
Step 5 - Choose individual components (optional)

If you don't want to use the Workloads feature to customize your Visual Studio installation, or you want to add more components than a workload installs, you can do so by installing or adding individual components from the **Individual components** tab. Choose what you want, and then follow the prompts.



Step 6 - Install language packs

By default, the installer program tries to match the language of the operating system when it runs for the first time. To install Visual Studio in a language of your choosing, choose the **Language packs** tab from the Visual Studio Installer, and then follow the prompts.

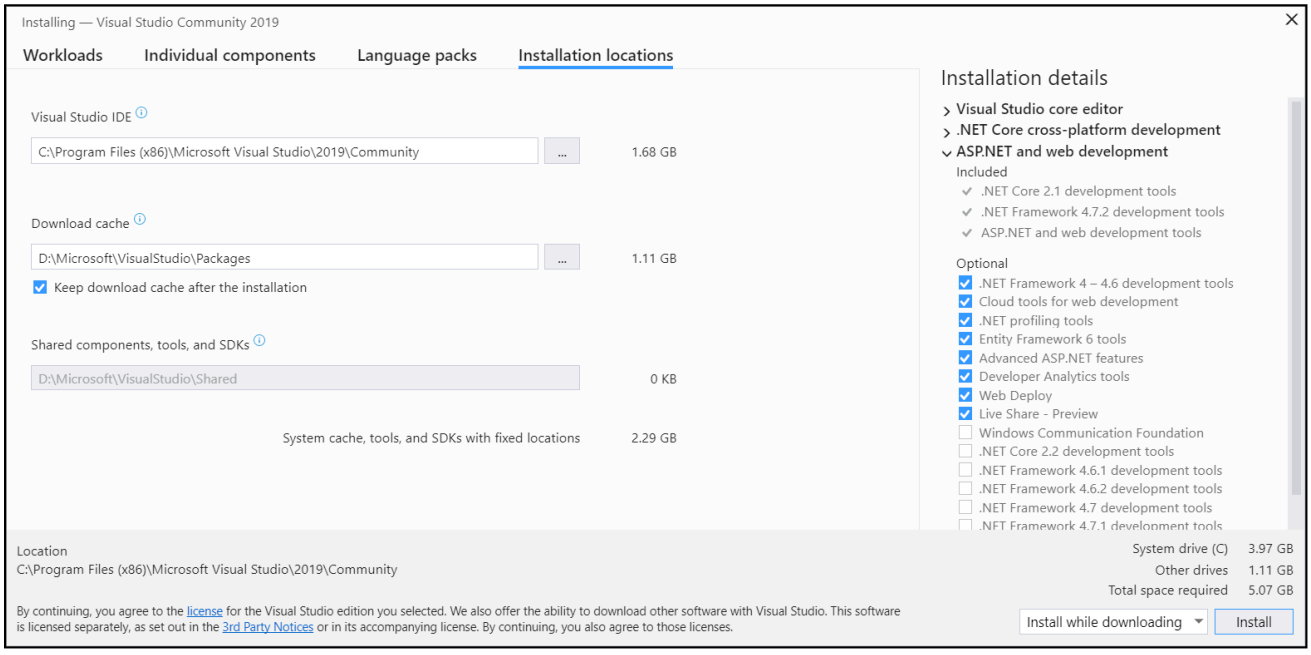


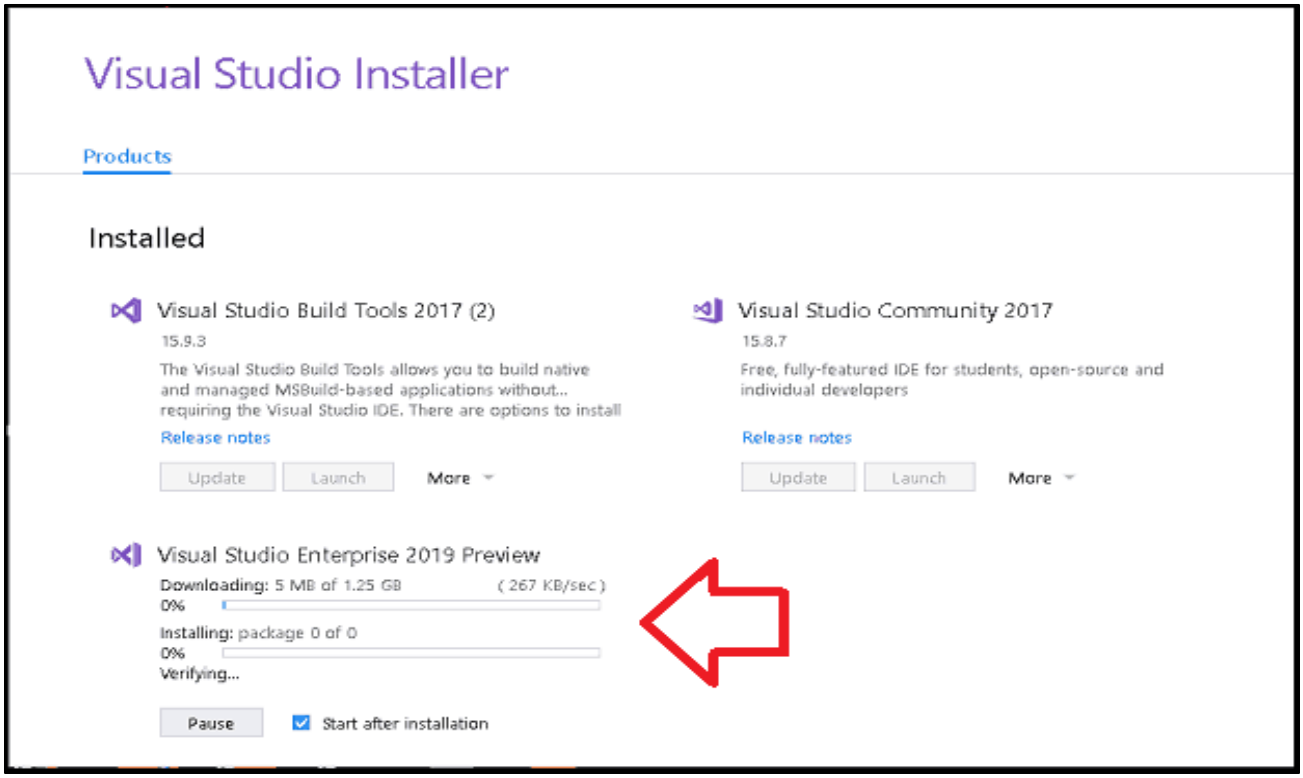
Change the installer language from the command line

Another way that you can change the default language is by running the installer from the command line. For example, you can force the installer to run in English by using the following command: vs_installer.exe --locale en-US. The installer will remember this setting when it is run the next time. The installer supports the following language tokens: zh-cn, zh-tw, cs-cz, and en-us, es-es, fr-fr, de-de, it-it, ja-jp, ko-kr, pl-pl, pt-br, ru-ru, and tr-tr.

Step 7 - Select the installation location (optional)

You can reduce the installation footprint of Visual Studio on your system drive. You can choose to move the download cache, shared components, SDKs, and tools to different drives, and keep Visual Studio on the drive that runs it the fastest.





Step 8 - Start developing

1. After Visual Studio installation is complete, select the **Launch** button to get started developing with Visual Studio.
2. On the start window, choose **Create a new project**.
3. In the search box, enter the type of app you want to create to see a list of available templates. The list of templates depends on the workloads that you chose during installation. To see different templates, choose different workloads.

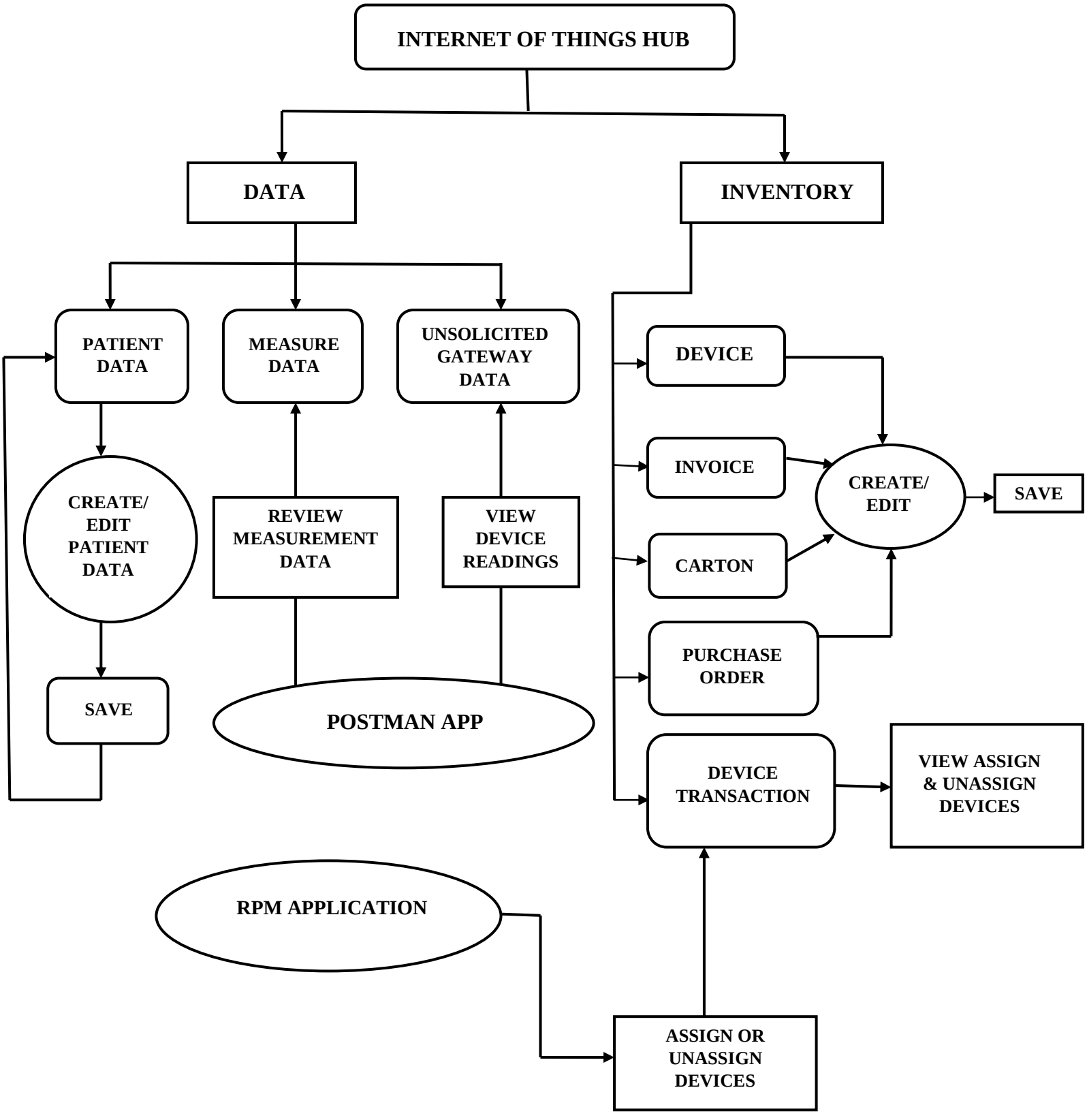
   You can also filter your search for a specific programming language by using the **Language** drop-down list. You can filter by using the **Platform** list and the **Project type** list, too.

4. Visual Studio opens your new project, and you're ready to code.

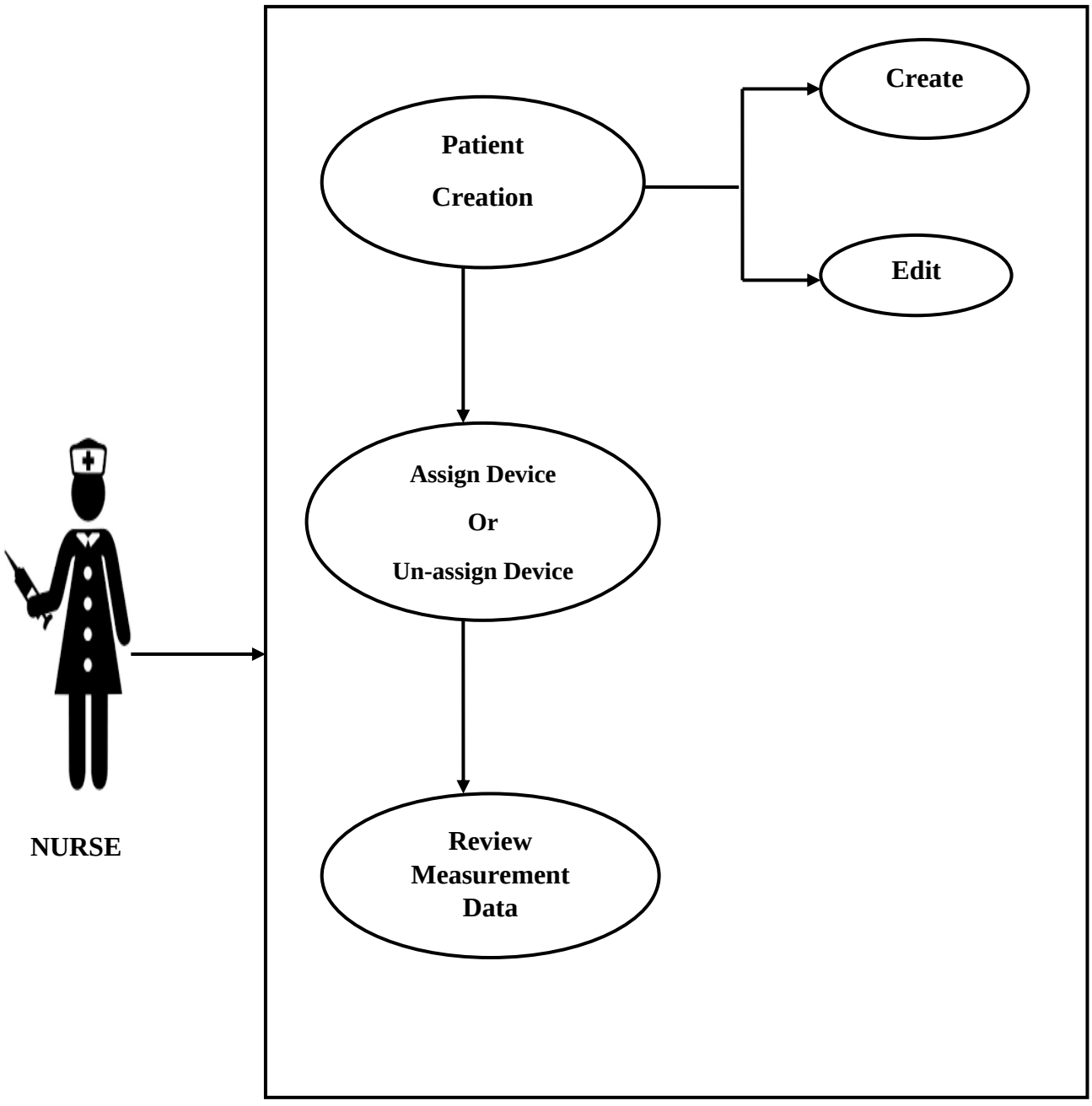
SYSTEM DESIGN

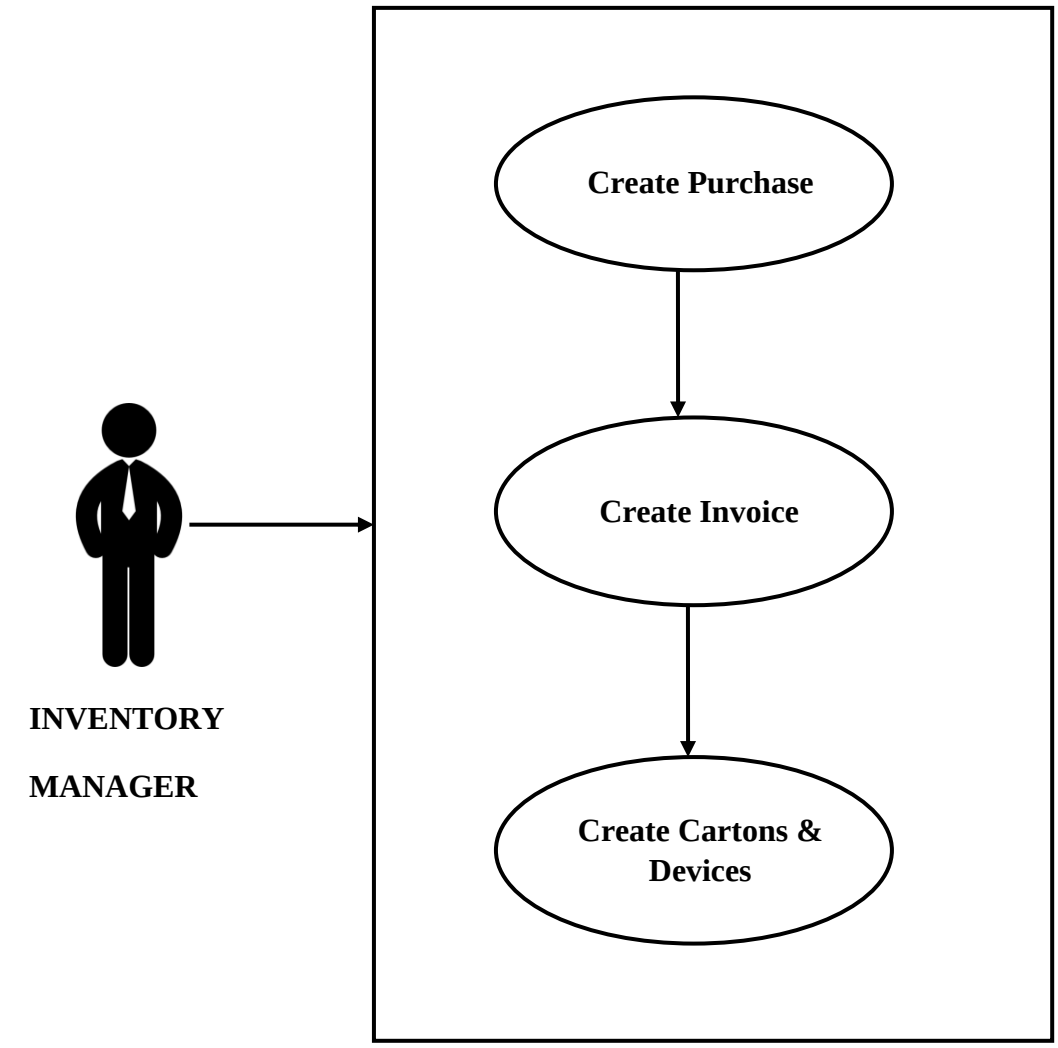
3. SYSTEM DESIGN

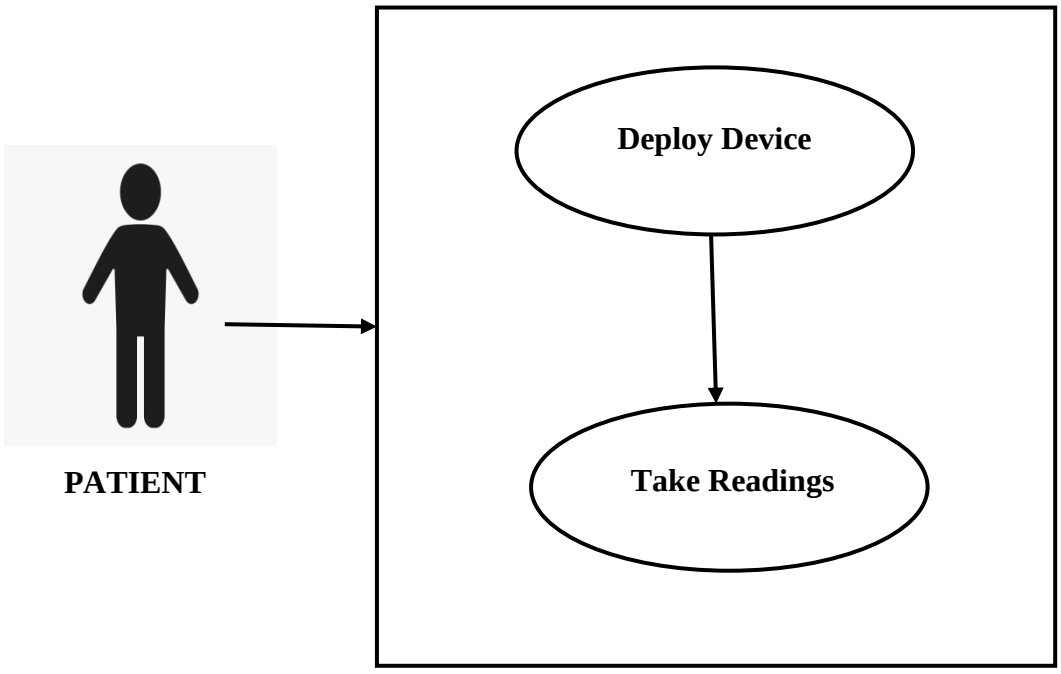
ENTITY RELATIONSHIP DIAGRAM:



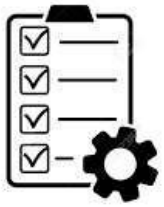
USE CASE DIAGRAM:




Create Purchase
Create Invoice
Create Cartons & Devices
INVENTORY MANAGER


Deploy Device
Take Readings
PATIENT

PROJECT DESCRIPTION



4. PROJECT DESCRIPTION

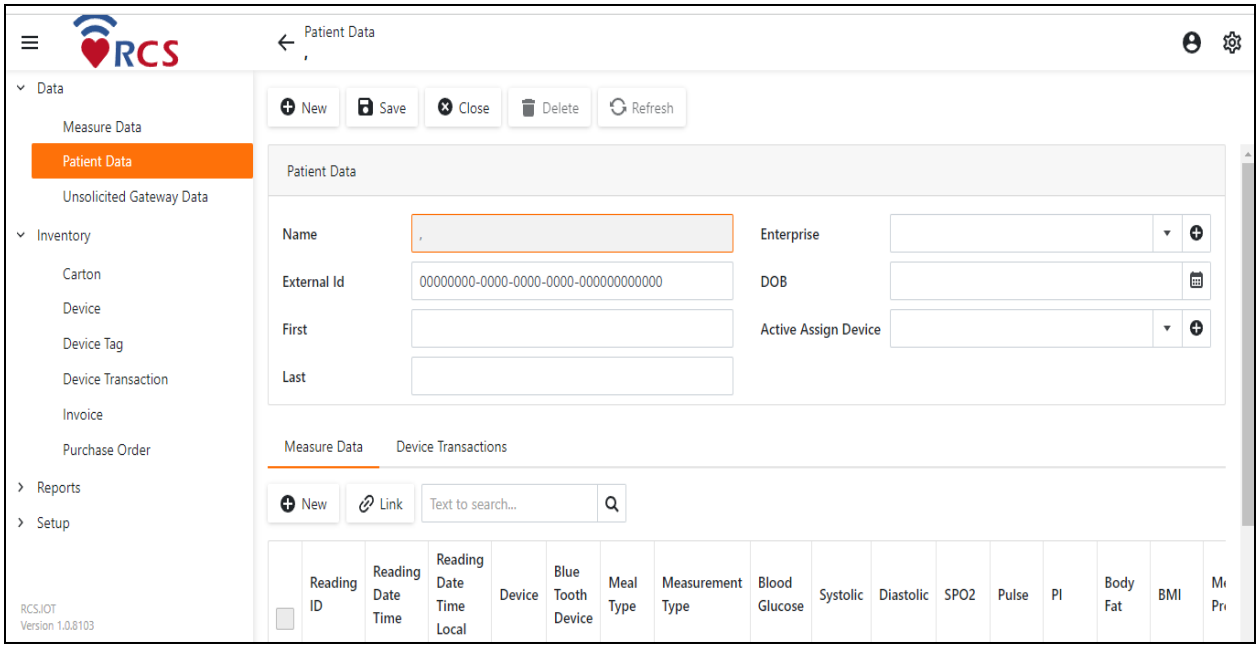
The project entitled **“INTERNET OF THINGS HUB”** module contains the following menus

1. Data
    - ❖ Patient Data
    - ❖ Measure Data
    - ❖ Unsolicited Gateway Data
2. Inventory
    - ❖ Carton
    - ❖ Devices
    - ❖ Device Transaction
    - ❖ Invoice
    - ❖ Purchase Order

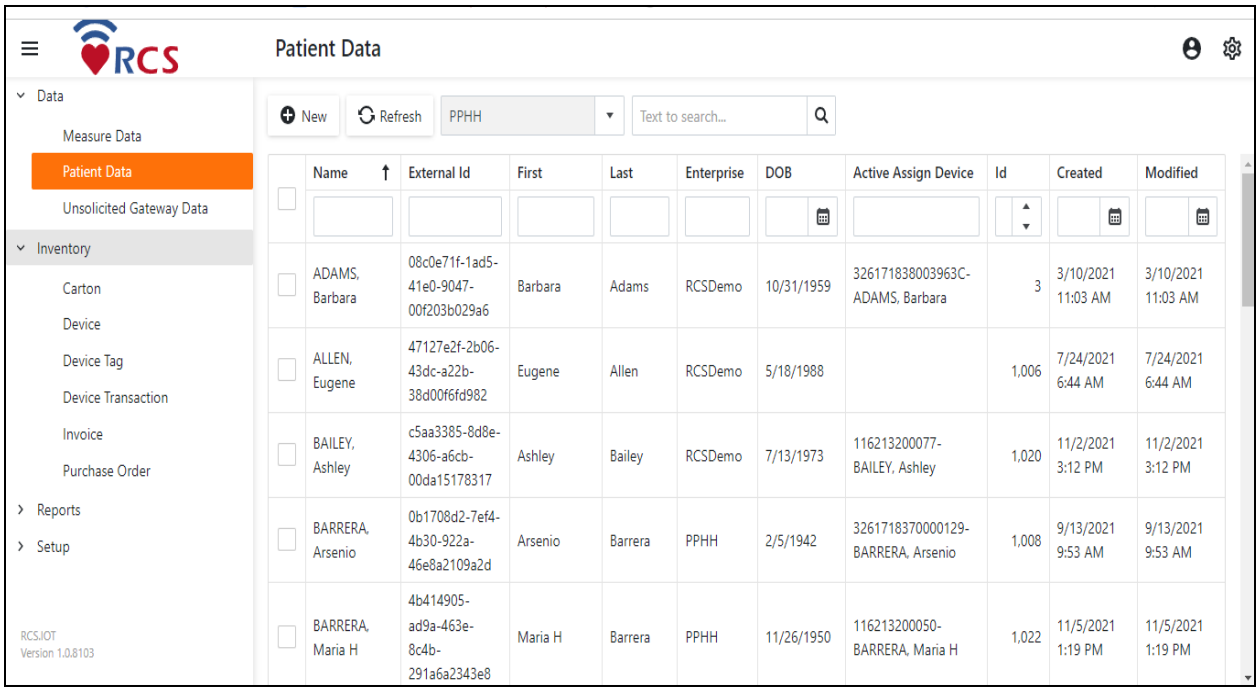
1. DATA:

- Data menu contains the group such as patient data, measure data, and unsolicited gateway data.

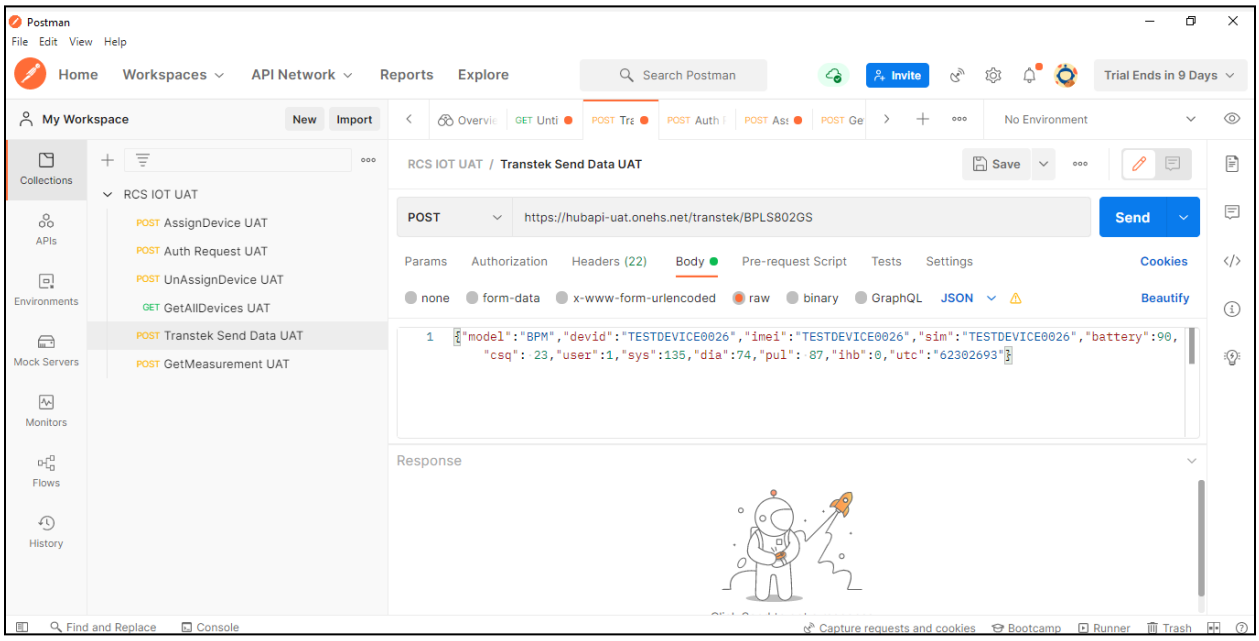
Patient Data: While providing devices for patient in RPM application the details of the patient will be stored along with its external id in the RCS IOT application.



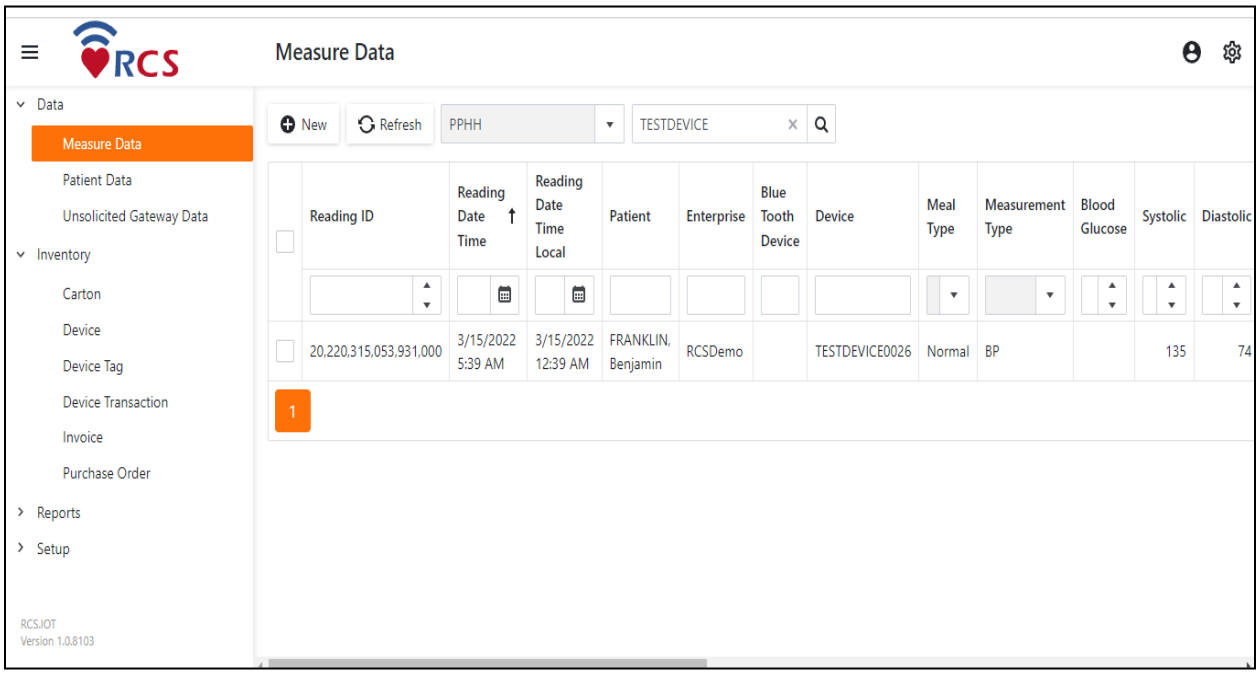
The above created patient's list will be displayed in the patient data menu. Here, we can update the details of the patient.



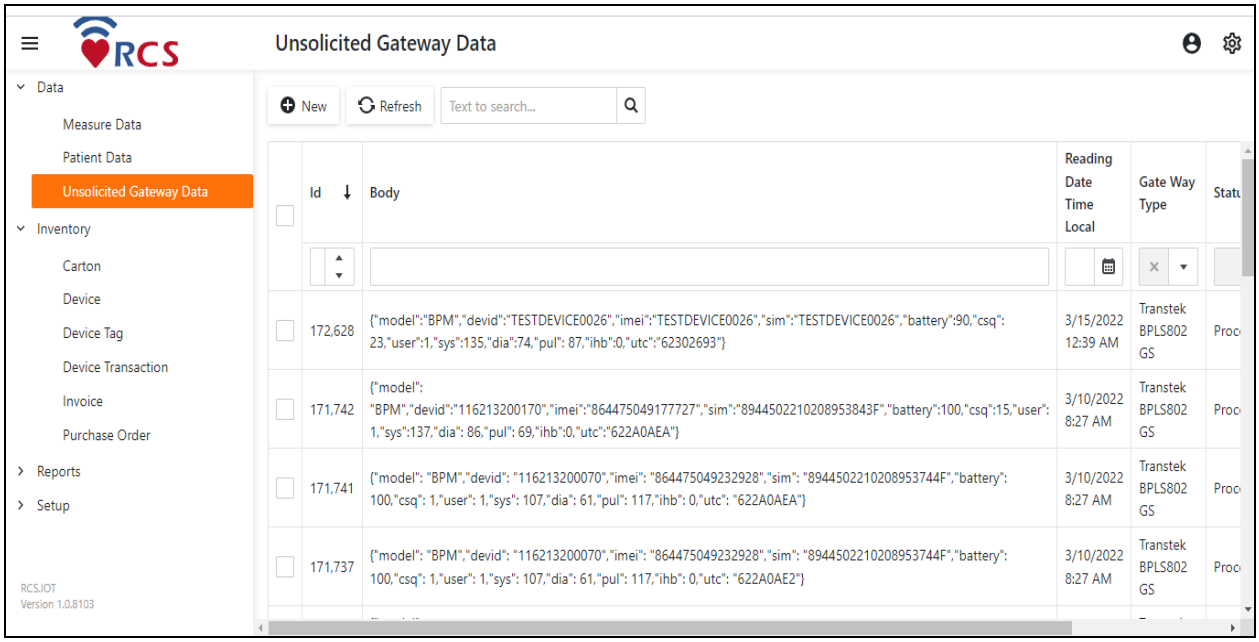
Measure Data: In the postman application, we will provide the name and id of the device and also we will provide the current time and then click send.



Then, it shows the readings of the patient by the devices and also displays the medication details of the patient.



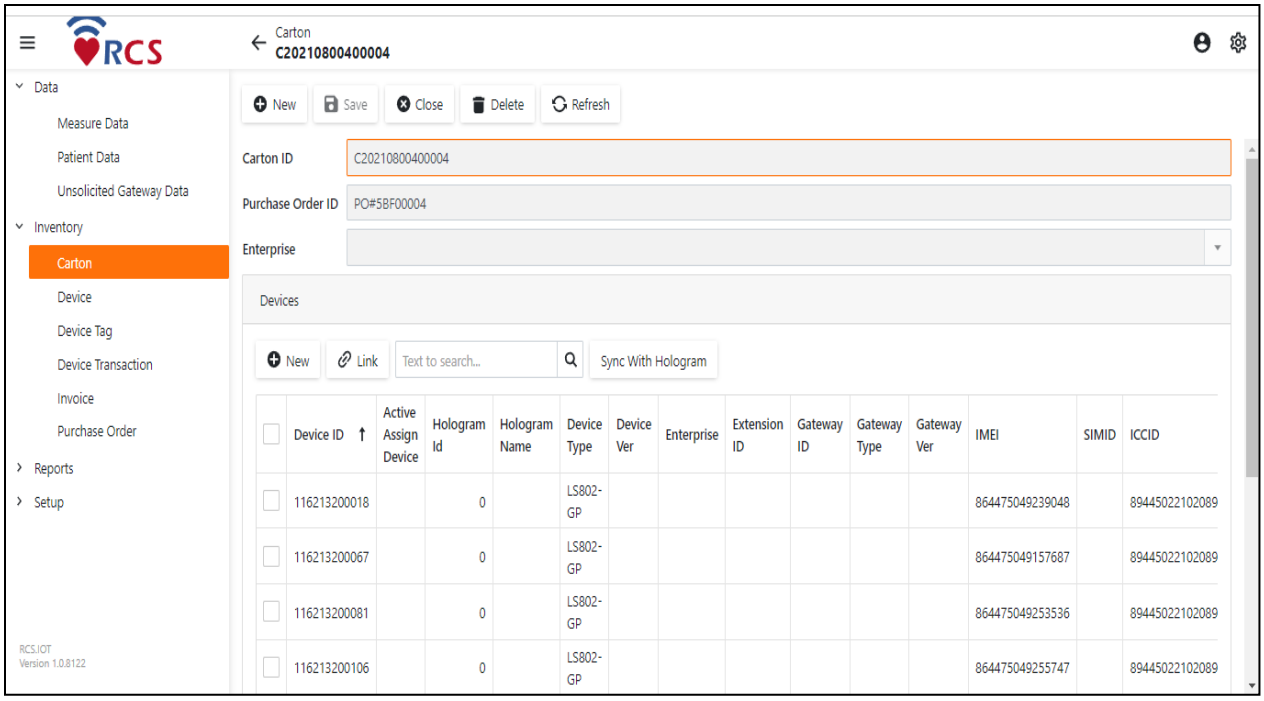
Unsolicited Gateway Data: It shows the list of device id and its type along with the readings in an assorted format.



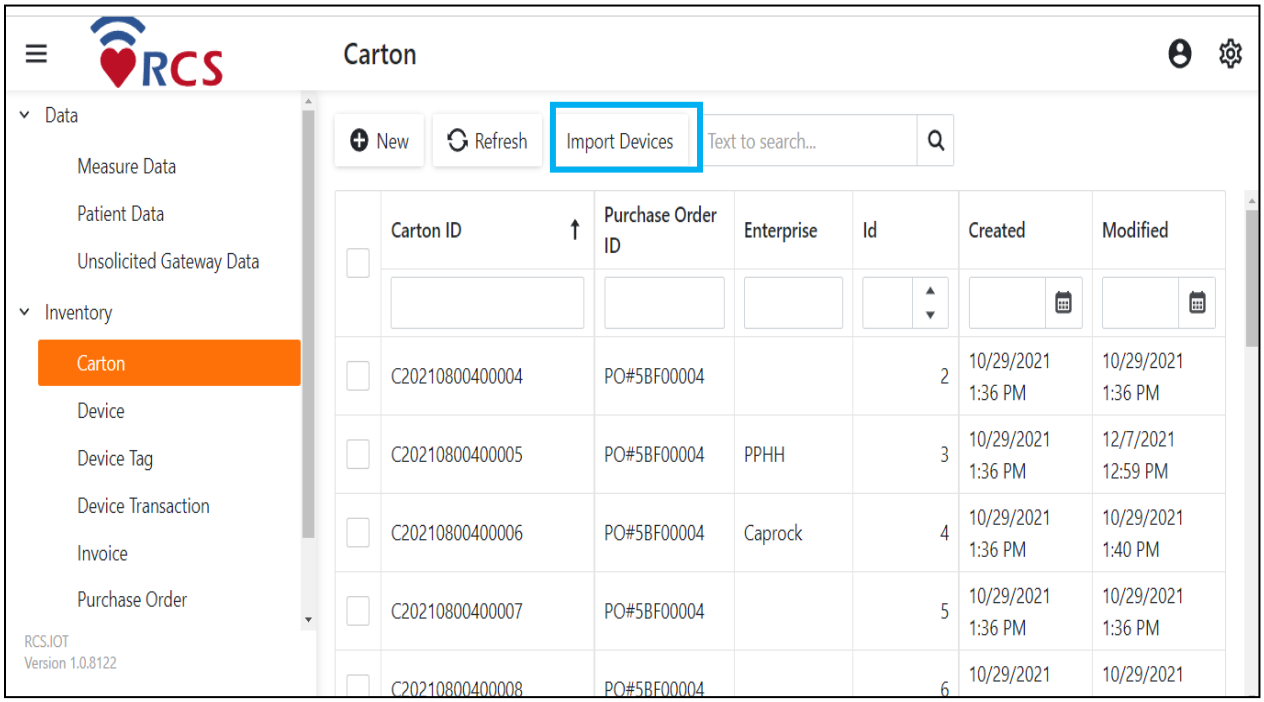
INVENTORY:

- Inventory menu contains groups such as carton, device, device transaction, and invoice and purchase order.

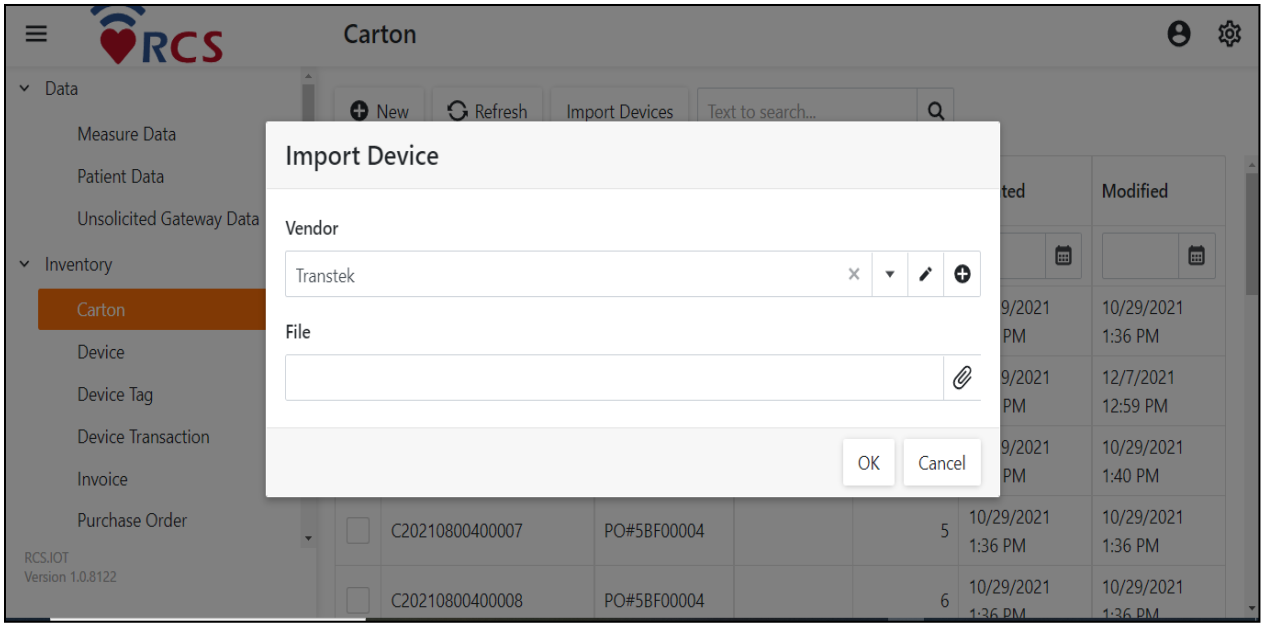
Carton: It is a collection of box which contains exactly ten devices and also displays the devices with its properties such as device id, device type, IMEI, ICCID.



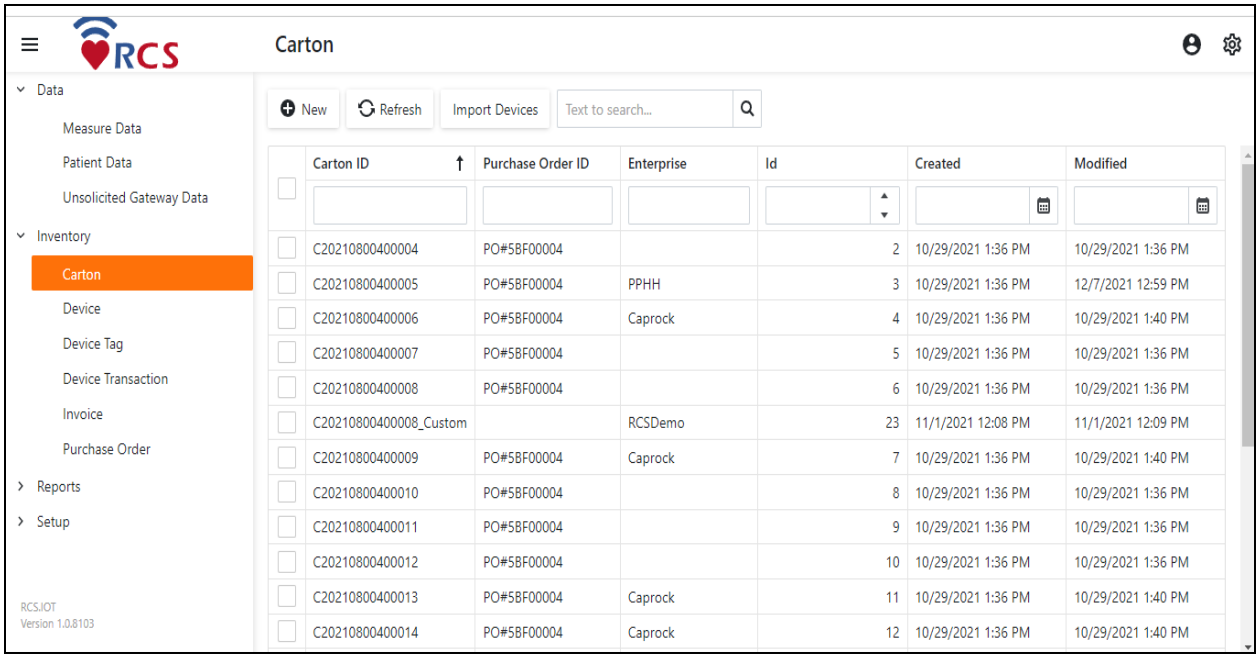
To import new devices, the import device button kept at top middle is clicked.



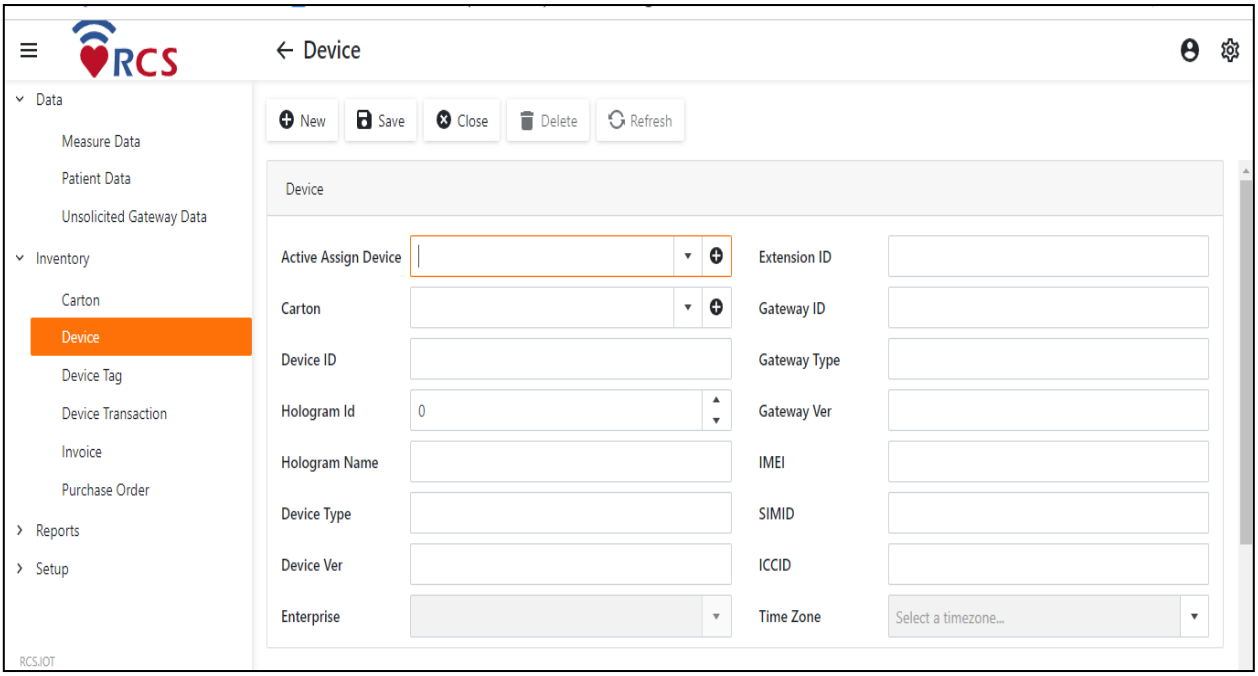
Then, import device window will appear, the device type will be given in vendor and their appropriate files are uploaded in file and then click “OK”



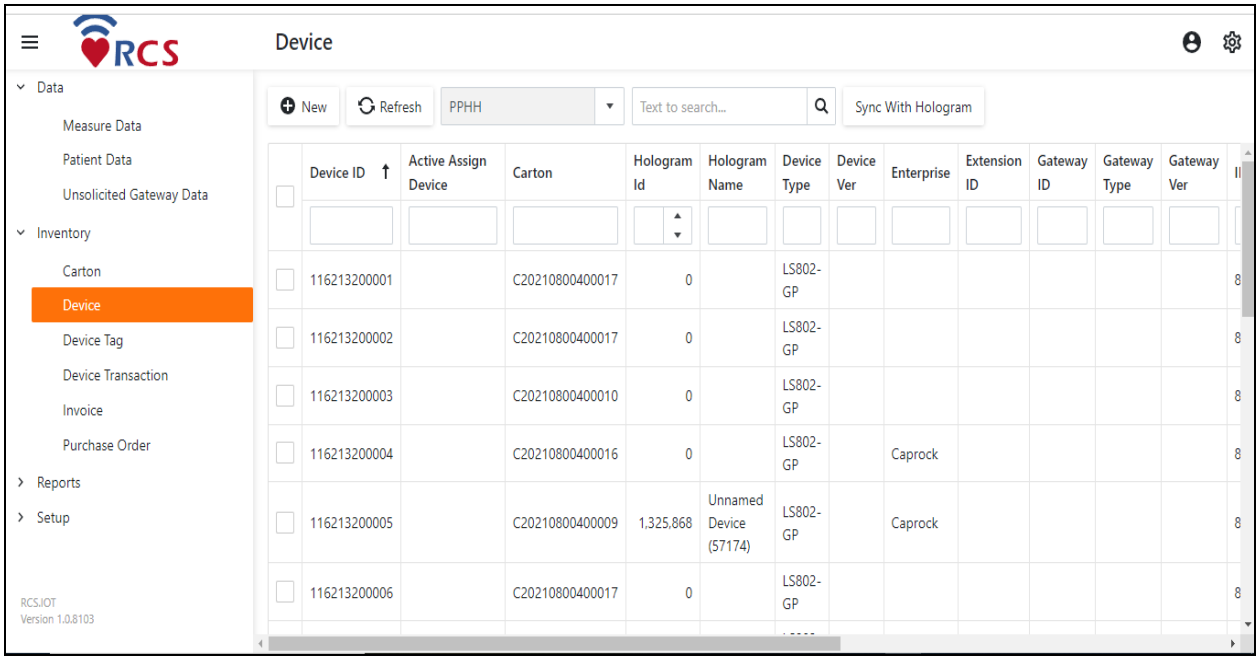
Then the imported device will be displayed in the carton menu with its appropriate carton id and purchase order id.



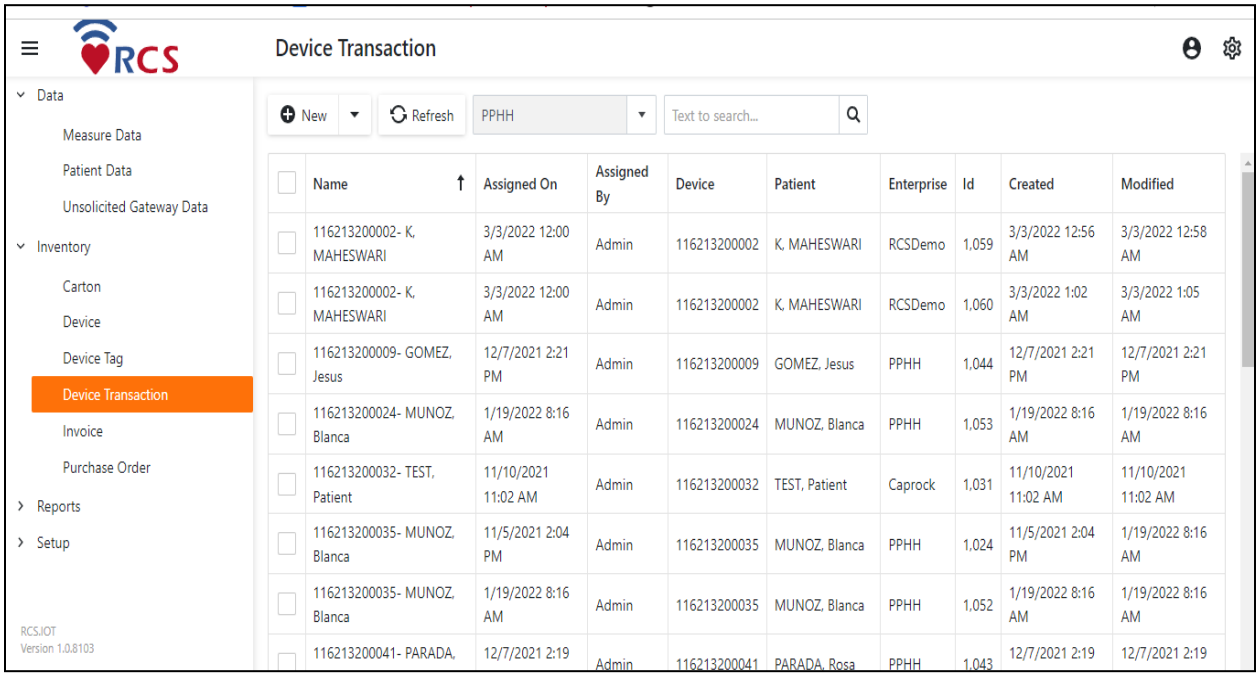
Device: To create a new device, the new button at the top left corner is clicked. Then the device id, device type, IMEI, SIMID, and ICCID these fields are required for creating the device were entered and then click save button the new device will be created.



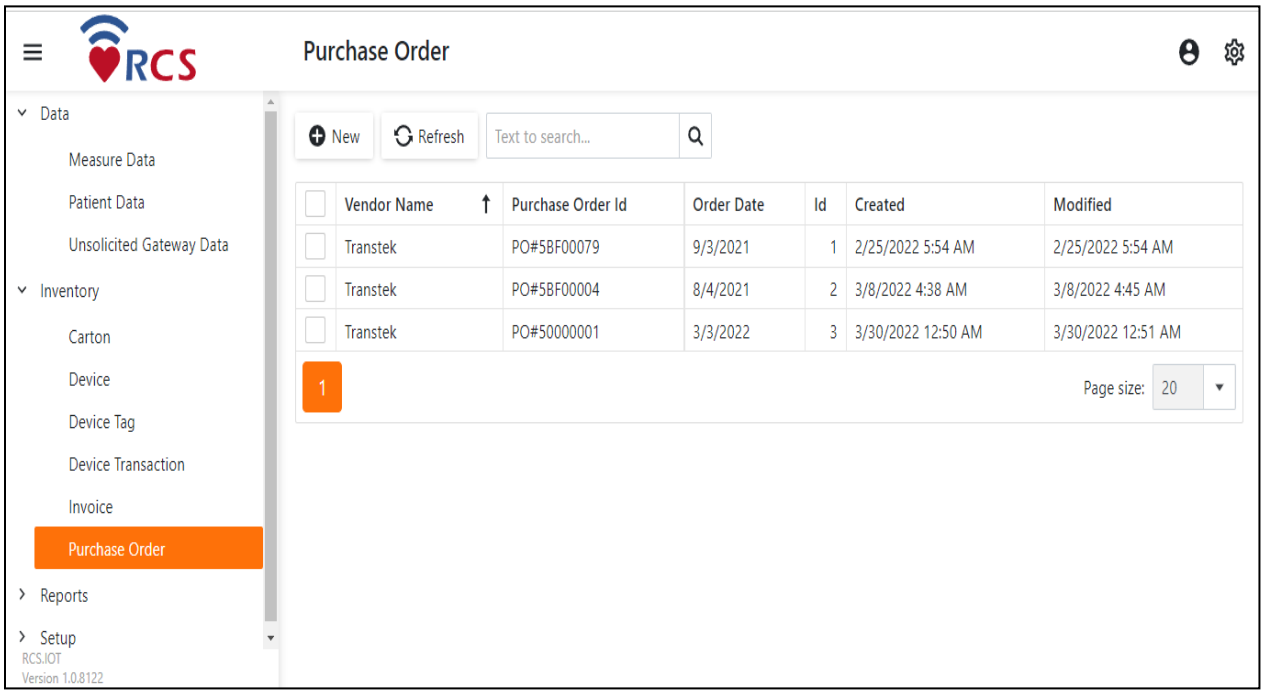
The above created device list will be displayed in the device menu. Here, we can update the detail of the device.



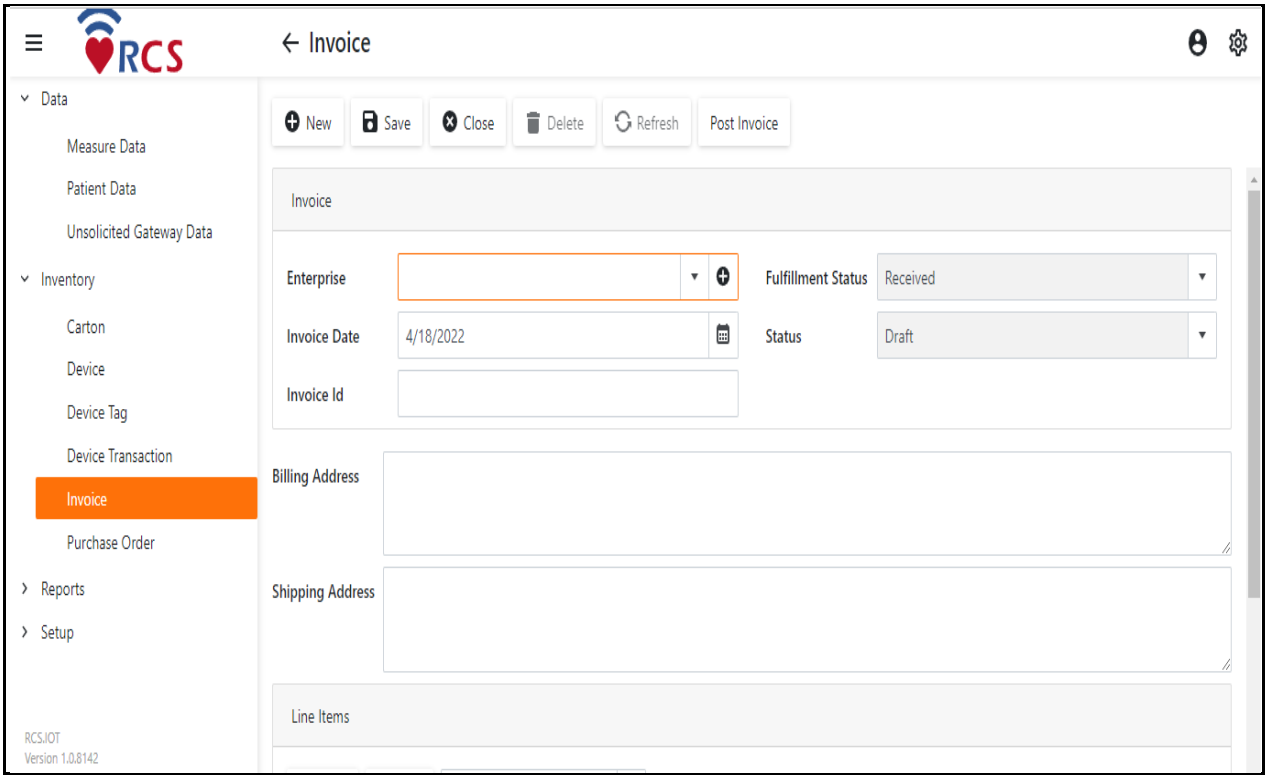
Device Transaction: It shows the devices assigned for the patients along with the name of the patient and id of the device, which can be assigned/unassigned/reassign in the remote patient monitoring in Iot hub application.



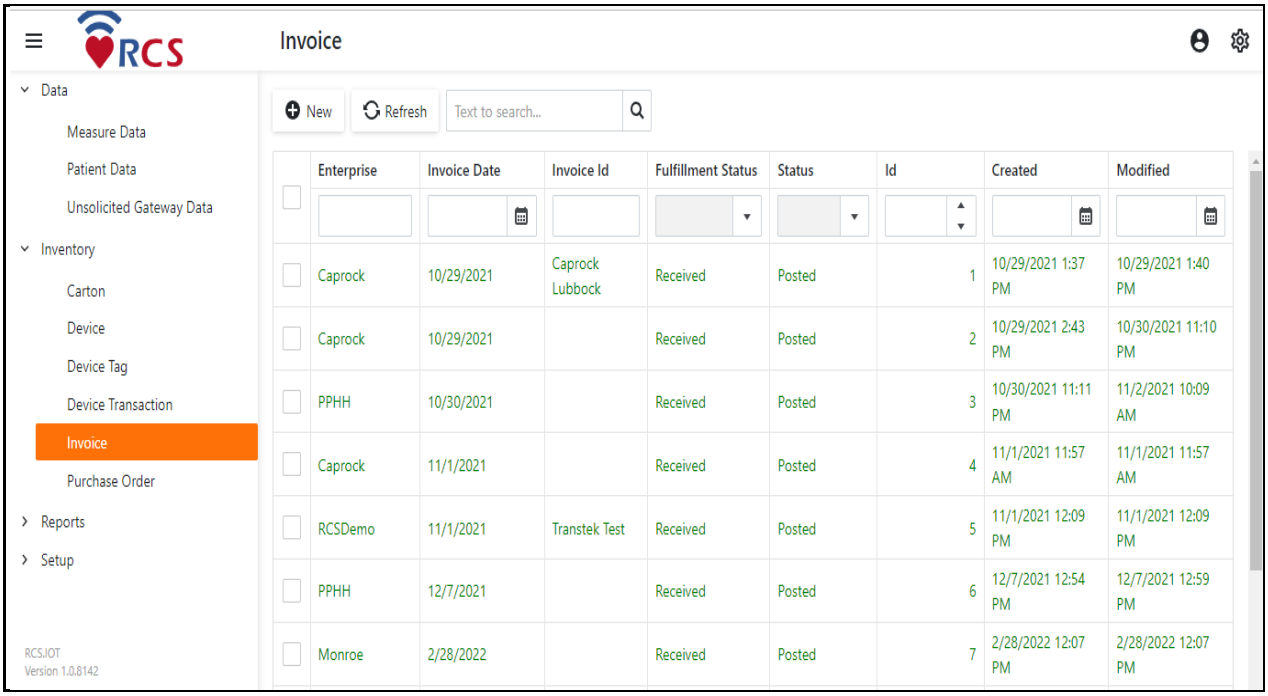
Purchase Order: The purchase order menu displays the imported device with its related vendor name, purchase order id and also displays the purchased date and time.



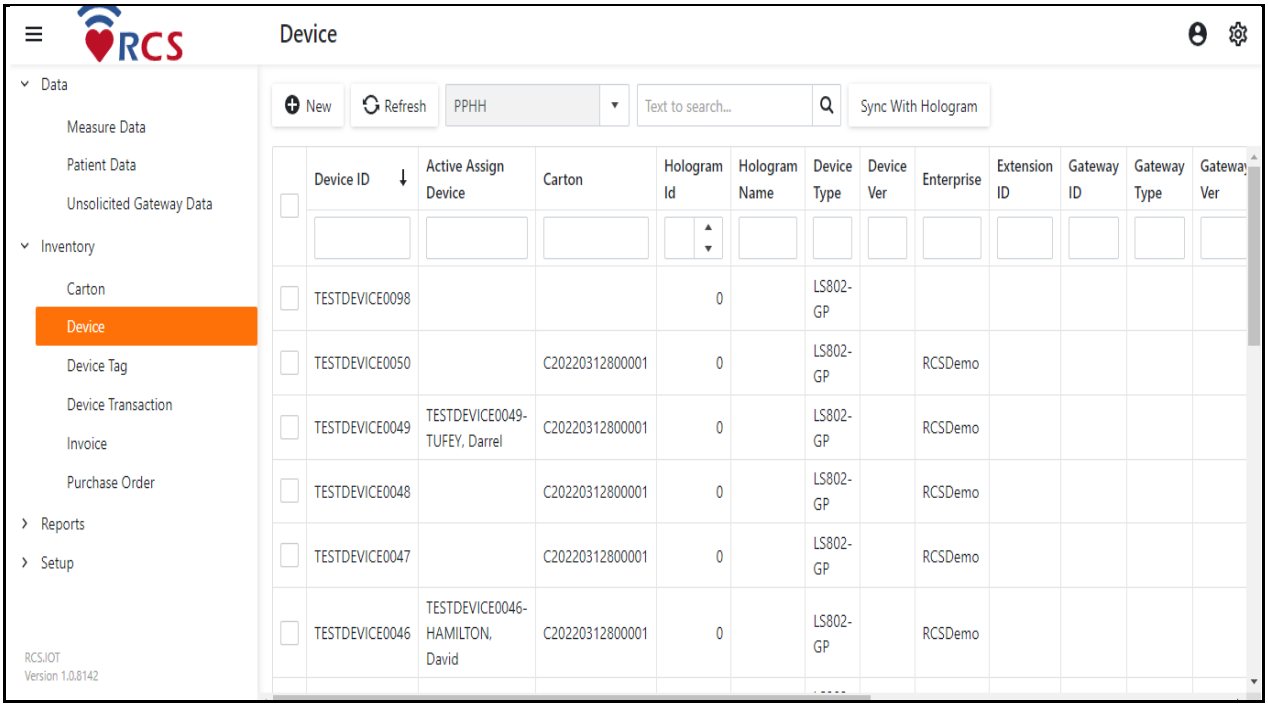
Invoice: Invoice provided device for medicare clinic or a company from the carton. While providing devices, the billing address, enterprise and shipping address must be given.



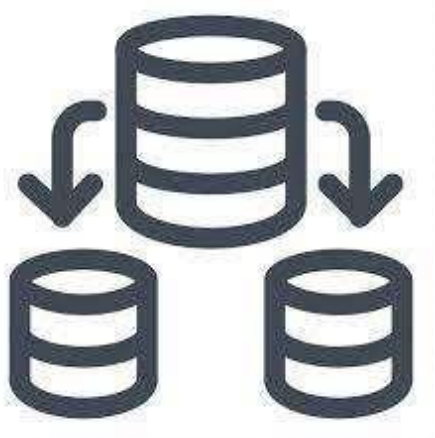
Then, the invoice menu displays the list of enterprises with its invoice date, fulfillment status.



Then, the device tab shows the list of devices with its appropriate id and also the enterprise name.



DATABASE DESCRIPTION



5. DATABASE DESCRIPTION

Table 5.1: measure data

ColumnName	Data Type	Allow Null
Id	Int	UnChecked
Created	Datetime	Checked
Modified	Datetime	Checked
ReadingID	Bigint	Checked
ReadingDateTime	Datetime	Checked
ReadingDateTimeLocal	Datetime	Checked
Patient	Int	Checked
Device	Int	Checked
MealType	Int	Checked
MeasurementType	Int	Checked
BloodGlucose	Float	Checked
Systolic	Float	Checked
Diastolic	Float	Checked
SPO2	Float	Checked
Pulse	Float	Checked
BodyFat	Float	Checked
BMI	Float	Checked
MeanPressure	Float	Checked
EarTemperature	Float	Checked
ForeheadTemperature	Float	Checked
BodyWeightKG	Float	Checked
AmbientTemperature	Float	Checked
IrregularHeartBeat	Bit	Checked
IsInvalidData	Bit	Checked
GroupId	nvarchar(MAX)	Checked

PatientId	nvarchar(MAX)	Checked
RecId	nvarchar(MAX)	Checked
MdataId	nvarchar(MAX)	Checked
Remark	nvarchar(MAX)	Checked
MdateTime	Datetime	Checked
MdateTimeUtc	Datetime	Checked
MType	Int	Checked
Mslot	Bigint	Checked
MValue1	Bigint	Checked
MValue2	nvarchar(MAX)	Checked
MValue3	nvarchar(MAX)	Checked
MRefNote1	nvarchar(MAX)	Checked
MRefNote2	nvarchar(MAX)	Checked
MRefNote3	nvarchar(MAX)	Checked
MRefNote4	nvarchar(MAX)	Checked
Mnote	nvarchar(MAX)	Checked
MpDateTime	Datetime	Checked
MpDateTimeUtc	Datetime	Checked
MdeviceType	nvarchar(MAX)	Checked
MdeviceId	nvarchar(MAX)	Checked
MmeterNote	nvarchar(MAX)	Checked
Battery	Bigint	Checked
SignalStrength	Bigint	Checked
OptimisticLockField	Int	Checked
GCRecord	Int	Checked
Enterprise	Int	Checked
BlueToothDevice	Int	Checked
PI	Float	Checked
Pleth	Int	Checked
ReadingOid	uniqueidentifier	Checked

Table 5.2: patient data

ColumnName	Data Type	Allow Null
Id	Int	Unchecked
Created	Datetime	Checked
Modified	Datetime	Checked
ExternalId	Uniqueidentifier	Checked
First	nvarchar(100)	Checked
Last	nvarchar(1)	Checked
DOB	Datetime	Checked
ActiveAssignDevice	Int	Checked
Enterprise	Int	Checked
OptimisticLockField	Int	Checked
GCRecord	Int	Checked

Table 5.3: unsolicited gateway data

ColumnName	Data Type	Allow Null
Id	Int	Unchecked
Created	Datetime	Checked
Modified	Datetime	Checked
Body	nvarchar(MAX)	Checked
Status	Int	Checked
ReadingDateTimeLocal	Datetime	Checked
GateWayType	Int	Checked
OptimisticLockField	Int	Checked
GCRecord	Int	Checked

`

Table 5.4: device transaction

ColumnName	Data Type	Allow Null
Id	Int	Unchecked
Created	Datetime	Checked
Modified	Datetime	Checked
AssignedOn	Datetime	Checked
AssignedBy	Uniqueidentifier	Checked
Device	Int	Checked
Patient	Int	Checked
IsActive	Bit	Checked
OptimisticLockField	Int	Checked
GCRecord	Int	Checked
Enterprise	Int	Checked
ObjectType	Int	Checked
Reason	nvarchar(100)	Checked

Table 5.5: carton

ColumnName	Data Type	Allow Null
Id	Int	Unchecked
Created	Datetime	Checked
Modified	Datetime	Checked
CartonID	nvarchar(100)	Checked
PurchaseOrderID	nvarchar(100)	Checked
Enterprise	Int	Checked
OptimisticLockField	Int	Checked
GCRecord	Int	Checked

Table 5.6: device

ColumnName	Data Type	Allow Null
Id	Int	Unchecked
Created	Datetime	Checked
Modified	Datetime	Checked
GatewayType	nvarchar(100)	Checked
GatewayID	nvarchar(100)	Checked
GatewayVer	nvarchar(100)	Checked
DeviceType	nvarchar(100)	Checked
DeviceID	nvarchar(100)	Checked
DeviceVer	nvarchar(100)	Checked
ExtensionID	nvarchar(100)	Checked
IMEI	nvarchar(100)	Checked
SIMID	nvarchar(100)	Checked
ActiveAssignDevice	Int	Checked
TimeZone	nvarchar(100)	Checked
Enterprise	Int	Checked
Carton	Int	Checked
ICCID	nvarchar(100)	Checked
HologramId	Bigint	Checked
OptimisticLockField	Int	Checked
GCRecord	Int	Checked
HologramName	nvarchar(100)	Checked

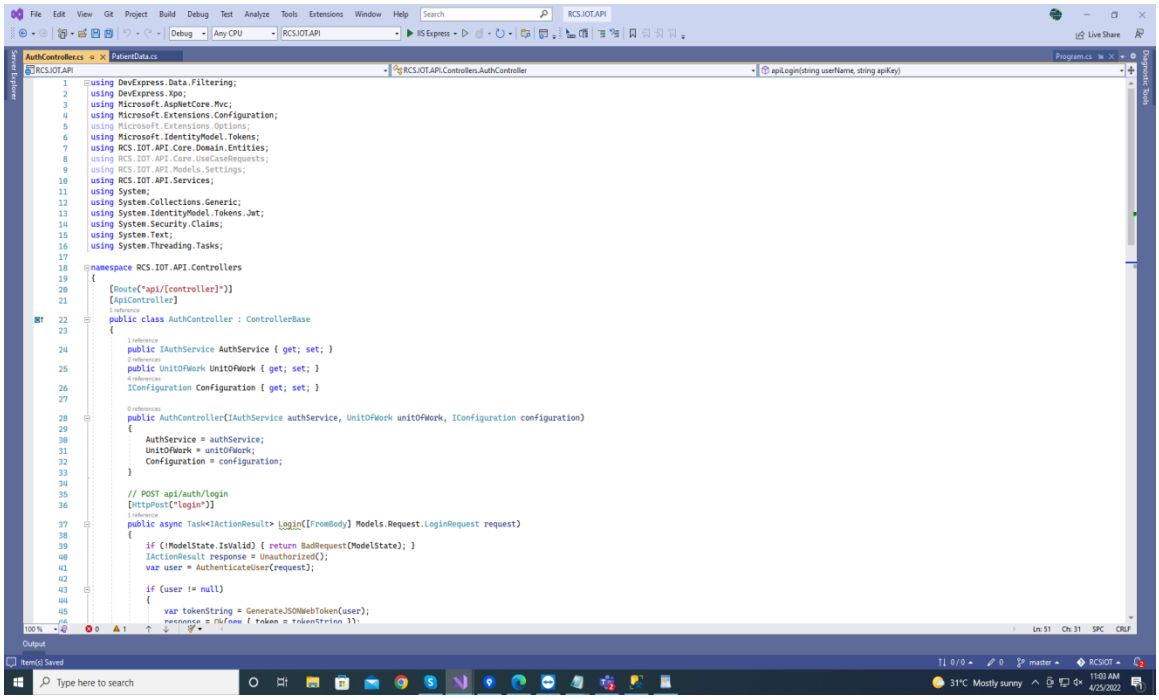
Table 5.7: invoice

ColumnName	Data Type	Allow Null
Id	Int	Unchecked
Created	Datetime	Checked
Modified	Datetime	Checked
Enterprise	Int	Checked
InvoiceDate	Datetime	Checked
InvoiceId	nvarchar(300)	Checked
Status	Int	Checked
OptimisticLockField	Int	Checked
GCRecord	Int	Checked
FulfillmentStatus	Int	Checked
BillingAddress	nvarchar(300)	Checked
ShippingAddress	nvarchar(300)	Checked

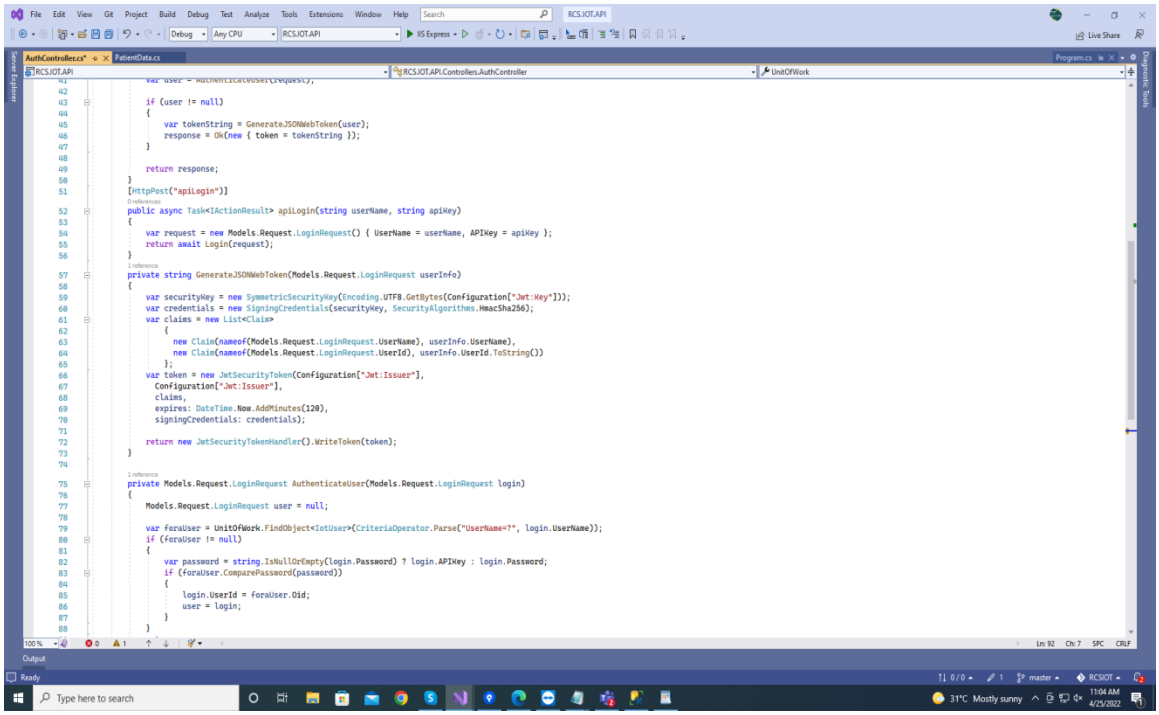
CODING

6. CODING

Login page:

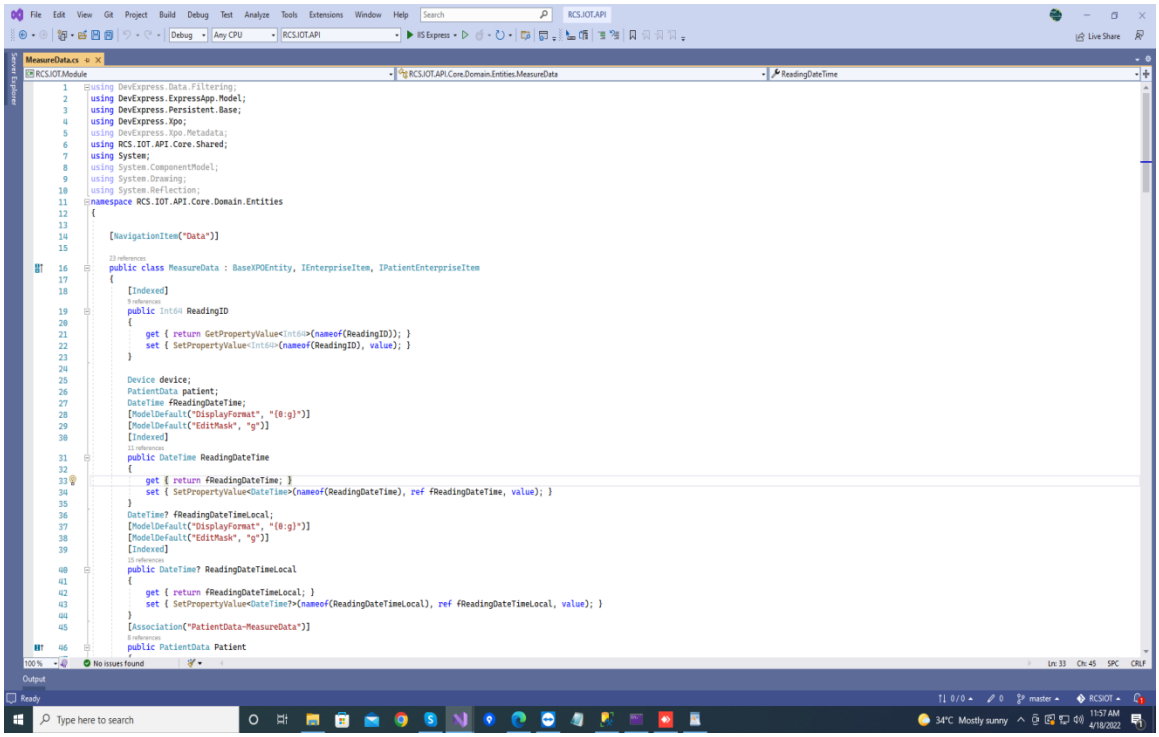


```
using DevExpress.Data.Filtering;
using DevExpress.Xpo;
using Microsoft.AspNetCore.Mvc;
using Microsoft.Extensions.Configuration;
using Microsoft.Extensions.Options;
using Microsoft.IdentityModel.Tokens;
using RCS.IOT.API.Core.Domain.Entities;
using RCS.IOT.API.Core.UseCaseRequests;
using RCS.IOT.API.Models.Settings;
using RCS.IOT.API.Services;
using System;
using System.Collections.Generic;
using System.IdentityModel.Tokens.Jwt;
using System.Security.Claims;
using System.Text;
using System.Threading.Tasks;

namespace RCS.IOT.API.Controllers
{
    [Route("api/[controller]")]
    [ApiController]
    public class AuthController : ControllerBase
    {
        public IAuthService AuthService { get; set; }
        public UnitOfWork UnitOfWork { get; set; }
        IConfiguration Configuration { get; set; }

        public AuthController(IAuthService authService, UnitOfWork unitOfWork, IConfiguration configuration)
        {
            AuthService = authService;
            UnitOfWork = unitOfWork;
            Configuration = configuration;
        }

        // POST api/auth/login
        [HttpPost("login")]
        public async Task<IActionResult> Login([FromBody] Models.Request.LoginRequest request)
        {
            if (!ModelState.IsValid) { return BadRequest(ModelState); }
            IActionResult response = Unauthorized();
            var user = AuthenticateUser(request);

            if (user != null)
            {
                var tokenString = GenerateJSONWebToken(user);
                response = Ok(new { token = tokenString });
            }

            return response;
        }
        [HttpPost("apiLogin")]
        public async Task<IActionResult> apiLogin(string userName, string apiKey)
        {
            var request = new Models.Request.LoginRequest() { UserName = userName, APIKey = apiKey };
            return await Login(request);
        }
        private string GenerateJSONWebToken(Models.Request.LoginRequest userInfo)
        {
            var securityKey = new SymmetricSecurityKey(Encoding.UTF8.GetBytes(Configuration["Jwt:Key"]));
            var credentials = new SigningCredentials(securityKey, SecurityAlgorithms.HmacSha256);
            var claims = new List<Claim>
                {
                  new Claim(nameof(Models.Request.LoginRequest.UserName), userInfo.UserName),
                  new Claim(nameof(Models.Request.LoginRequest.UserId), userInfo.UserId.ToString())
                };
            var token = new JwtSecurityToken(Configuration["Jwt:Issuer"],
              Configuration["Jwt:Issuer"],
              claims,
              expires: DateTime.Now.AddMinutes(120),
              signingCredentials: credentials);

            return new JwtSecurityTokenHandler().WriteToken(token);
        }

        private Models.Request.LoginRequest AuthenticateUser(Models.Request.LoginRequest login)
        {
            Models.Request.LoginRequest user = null;

            var foraUser = UnitOfWork.FindObject<IotUser>(CriteriaOperator.Parse("UserName=?", login.UserName));
            if (foraUser != null)
            {
                var password = string.IsNullOrEmpty(login.Password) ? login.APIKey : login.Password;
                if (foraUser.ComparePassword(password))
                {
                    login.UserId = foraUser.Oid;
                    user = login;
                }
            }
```

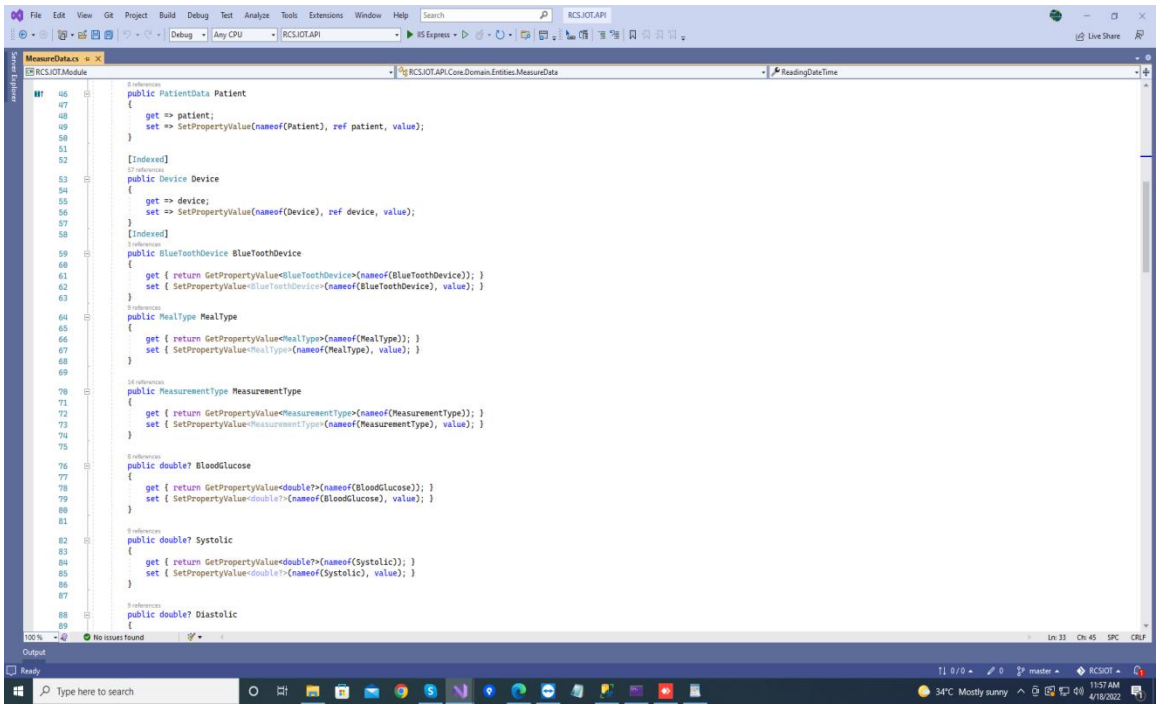



```
        }
        [HttpPost("apiLogin")]
        public async Task<IActionResult> apiLogin(string userName, string apiKey)
        {
            var request = new Models.Request.LoginRequest() { UserName = userName, APIKey = apiKey };
            return await Login(request);
        }
        private string GenerateJSONWebToken(Models.Request.LoginRequest userInfo)
        {
            var securityKey = new SymmetricSecurityKey(Encoding.UTF8.GetBytes(Configuration["Jwt:Key"]));
            var credentials = new SigningCredentials(securityKey, SecurityAlgorithms.HmacSha256);
            var claims = new List<Claim>
                {
                  new Claim(nameof(Models.Request.LoginRequest.UserName), userInfo.UserName),
                  new Claim(nameof(Models.Request.LoginRequest.UserId), userInfo.UserId.ToString())
                };
            var token = new JwtSecurityToken(Configuration["Jwt:Issuer"],
              Configuration["Jwt:Issuer"],
              claims,
              expires: DateTime.Now.AddMinutes(120),
              signingCredentials: credentials);

            return new JwtSecurityTokenHandler().WriteToken(token);
        }

        private Models.Request.LoginRequest AuthenticateUser(Models.Request.LoginRequest login)
        {
            Models.Request.LoginRequest user = null;

            var foraUser = UnitOfWork.FindObject<IotUser>(CriteriaOperator.Parse("UserName=?", login.UserName));
            if (foraUser != null)
            {
                var password = string.IsNullOrEmpty(login.Password) ? login.APIKey : login.Password;
                if (foraUser.ComparePassword(password))
                {
                    login.UserId = foraUser.Oid;
                    user = login;
                }
            }
```

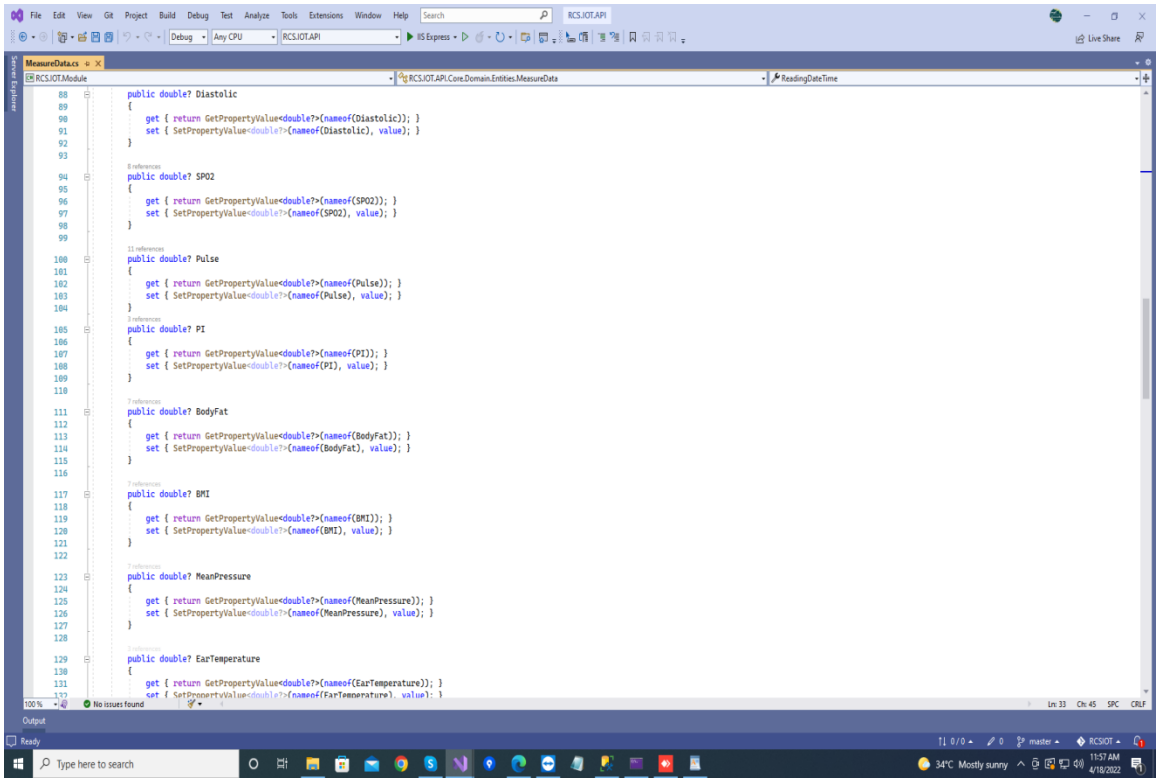
Measure data:



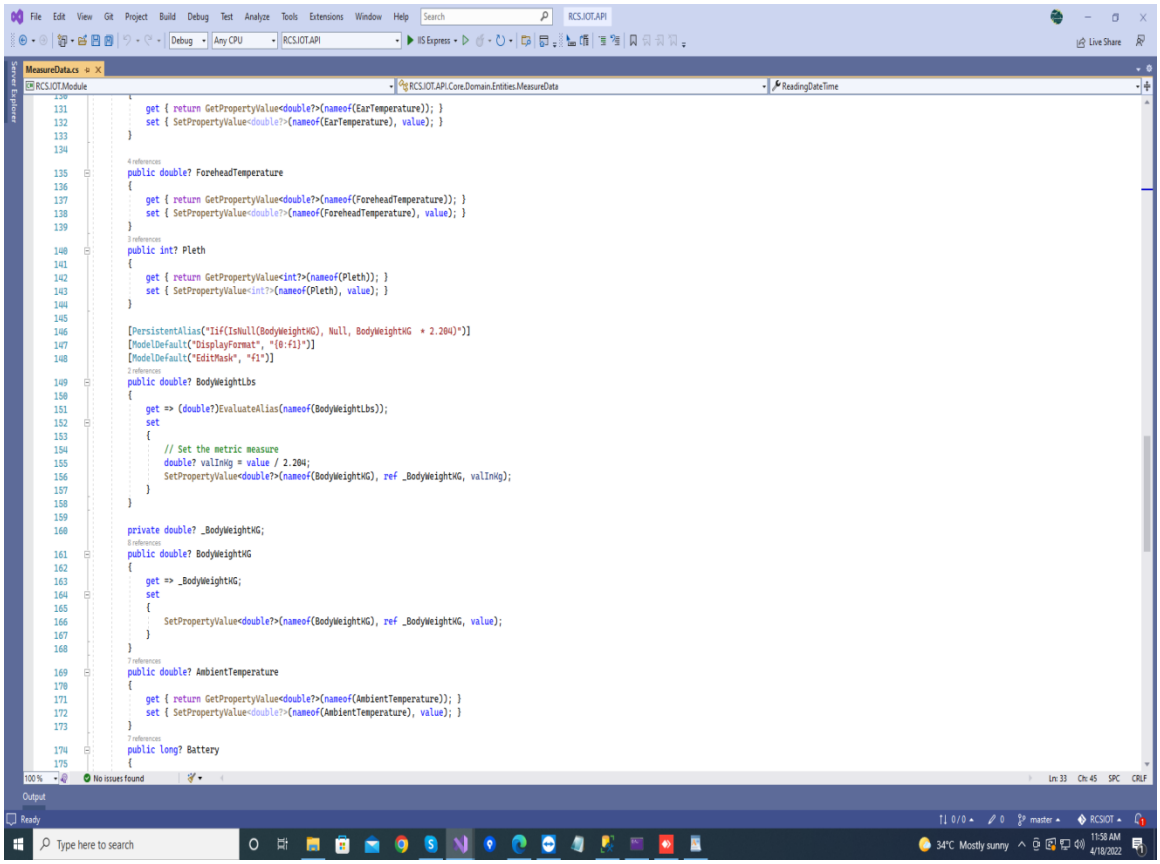
```
using DevExpress.Data.Filtering;
using DevExpress.ExpressApp.Model;
using DevExpress.Persistent.Base;
using DevExpress.Xpo;
using DevExpress.Xpo.Metadata;
using RCS.IOT.API.Core.Shared;
using System;
using System.ComponentModel;
using System.Drawing;
using System.Reflection;
namespace RCS.IOT.API.Core.Domain.Entities
{

    [NavigationItem("Data")]

    23 references
    public class MeasureData : BaseXPOEntity, IEnterpriseItem, IPatientEnterpriseItem
    {
        [Indexed]
        9 references
        public Int64 ReadingID
        {
            get { return GetPropertyValue<Int64>(nameof(ReadingID)); }
            set { SetPropertyValue<Int64>(nameof(ReadingID), value); }
        }

        Device device;
        PatientData patient;
        DateTime fReadingDateTime;
        [ModelDefault("DisplayFormat", "{0:g}")]
        [ModelDefault("EditMask", "g")]
        [Indexed]
        11 references
        public DateTime ReadingDateTime
        {
            get { return fReadingDateTime; }
            set { SetPropertyValue<DateTime>(nameof(ReadingDateTime), ref fReadingDateTime, value); }
        }
        DateTime? fReadingDateTimeLocal;
        [ModelDefault("DisplayFormat", "{0:g}")]
        [ModelDefault("EditMask", "g")]
        [Indexed]
        15 references
        public DateTime? ReadingDateTimeLocal
        {
            get { return fReadingDateTimeLocal; }
            set { SetPropertyValue<DateTime?>(nameof(ReadingDateTimeLocal), ref fReadingDateTimeLocal, value); }
        }
        [Association("PatientData-MeasureData")]
        8 references
        public PatientData Patient
```

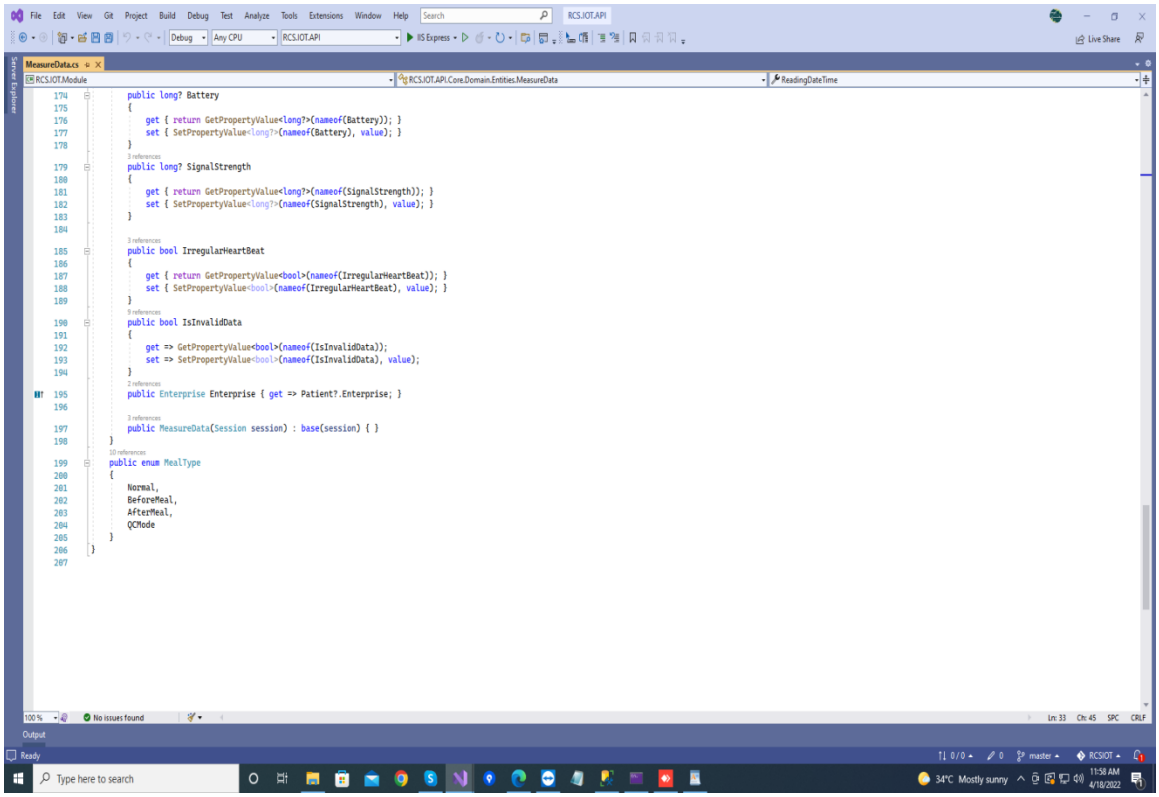


```
        8 references
        public PatientData Patient
        {
            get => patient;
            set => SetPropertyValue(nameof(Patient), ref patient, value);
        }

        [Indexed]
        17 references
        public Device Device
        {
            get => device;
            set => SetPropertyValue(nameof(Device), ref device, value);
        }
        [Indexed]
        3 references
        public BlueToothDevice BlueToothDevice
        {
            get { return GetPropertyValue<BlueToothDevice>(nameof(BlueToothDevice)); }
            set { SetPropertyValue<BlueToothDevice>(nameof(BlueToothDevice), value); }
        }
        9 references
        public MealType MealType
        {
            get { return GetPropertyValue<MealType>(nameof(MealType)); }
            set { SetPropertyValue<MealType>(nameof(MealType), value); }
        }

        14 references
        public MeasurementType MeasurementType
        {
            get { return GetPropertyValue<MeasurementType>(nameof(MeasurementType)); }
            set { SetPropertyValue<MeasurementType>(nameof(MeasurementType), value); }
        }

        8 references
        public double? BloodGlucose
        {
            get { return GetPropertyValue<double?>(nameof(BloodGlucose)); }
            set { SetPropertyValue<double?>(nameof(BloodGlucose), value); }
        }

        9 references
        public double? Systolic
        {
            get { return GetPropertyValue<double?>(nameof(Systolic)); }
            set { SetPropertyValue<double?>(nameof(Systolic), value); }
        }

        9 references
        public double? Diastolic
        {
```



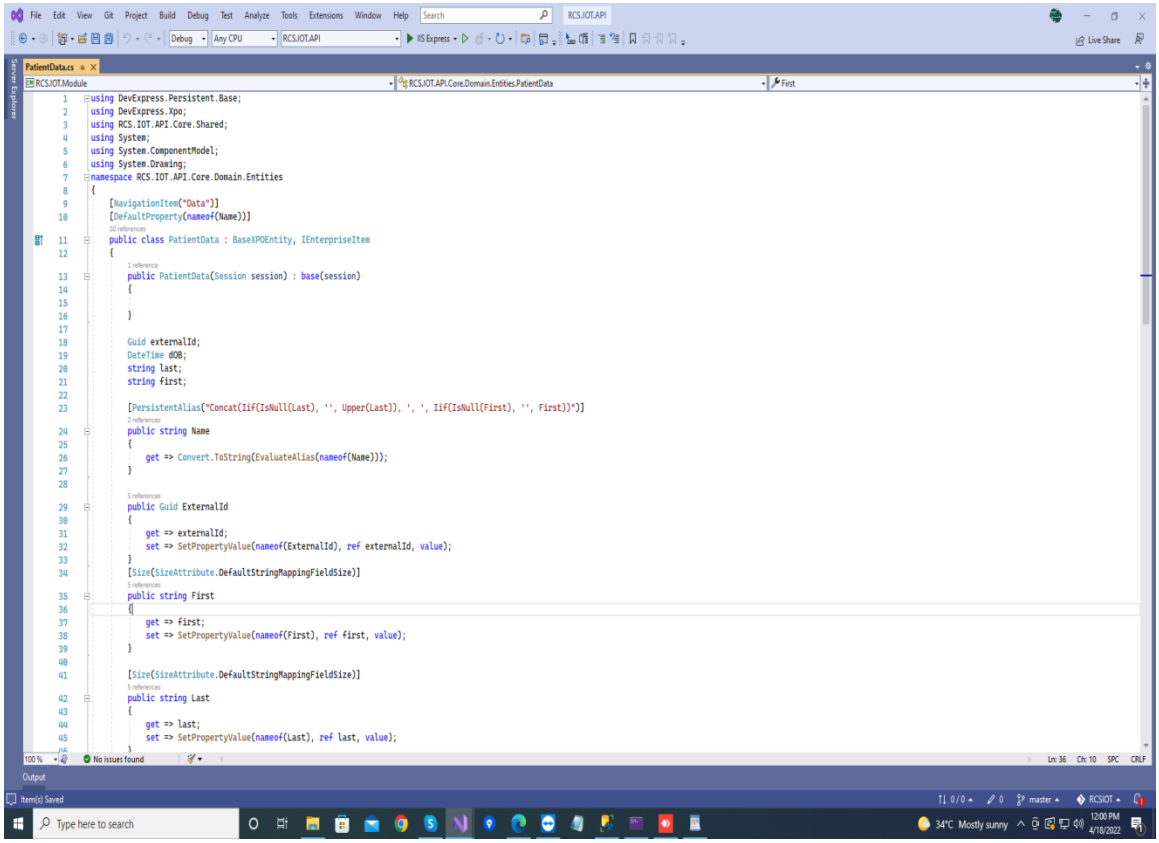
```
public double? Diastolic
{
    get { return GetPropertyValue<double?>(nameof(Diastolic)); }
    set { SetPropertyValue<double?>(nameof(Diastolic), value); }
}

8 references
public double? SPO2
{
    get { return GetPropertyValue<double?>(nameof(SPO2)); }
    set { SetPropertyValue<double?>(nameof(SPO2), value); }
}

11 references
public double? Pulse
{
    get { return GetPropertyValue<double?>(nameof(Pulse)); }
    set { SetPropertyValue<double?>(nameof(Pulse), value); }
}
3 references
public double? PI
{
    get { return GetPropertyValue<double?>(nameof(PI)); }
    set { SetPropertyValue<double?>(nameof(PI), value); }
}

7 references
public double? BodyFat
{
    get { return GetPropertyValue<double?>(nameof(BodyFat)); }
    set { SetPropertyValue<double?>(nameof(BodyFat), value); }
}

7 references
public double? BMI
{
    get { return GetPropertyValue<double?>(nameof(BMI)); }
    set { SetPropertyValue<double?>(nameof(BMI), value); }
}

7 references
public double? MeanPressure
{
    get { return GetPropertyValue<double?>(nameof(MeanPressure)); }
    set { SetPropertyValue<double?>(nameof(MeanPressure), value); }
}

7 references
public double? EarTemperature
{
    get { return GetPropertyValue<double?>(nameof(EarTemperature)); }
    set { SetPropertyValue<double?>(nameof(EarTemperature), value); }
}

4 references
public double? ForeheadTemperature
{
    get { return GetPropertyValue<double?>(nameof(ForeheadTemperature)); }
    set { SetPropertyValue<double?>(nameof(ForeheadTemperature), value); }
}
3 references
public int? Pleth
{
    get { return GetPropertyValue<int?>(nameof(Pleth)); }
    set { SetPropertyValue<int?>(nameof(Pleth), value); }
}

[PersistentAlias("Iif(IsNull(BodyWeightKG), Null, BodyWeightKG  * 2.204)")]
[ModelDefault("DisplayFormat", "{0:f1}")]
[ModelDefault("EditMask", "f1")]
2 references
public double? BodyWeightLbs
{
    get => (double?)EvaluateAlias(nameof(BodyWeightLbs));
    set
    {
        // Set the metric measure
        double? valInKg = value / 2.204;
        SetPropertyValue<double?>(nameof(BodyWeightKG), ref _BodyWeightKG, valInKg);
    }
}

private double? _BodyWeightKG;
6 references
public double? BodyWeightKG
{
    get => _BodyWeightKG;
    set
    {
        SetPropertyValue<double?>(nameof(BodyWeightKG), ref _BodyWeightKG, value);
    }
}
7 references
public double? AmbientTemperature
{
    get { return GetPropertyValue<double?>(nameof(AmbientTemperature)); }
    set { SetPropertyValue<double?>(nameof(AmbientTemperature), value); }
}
7 references
public long? Battery
{
```



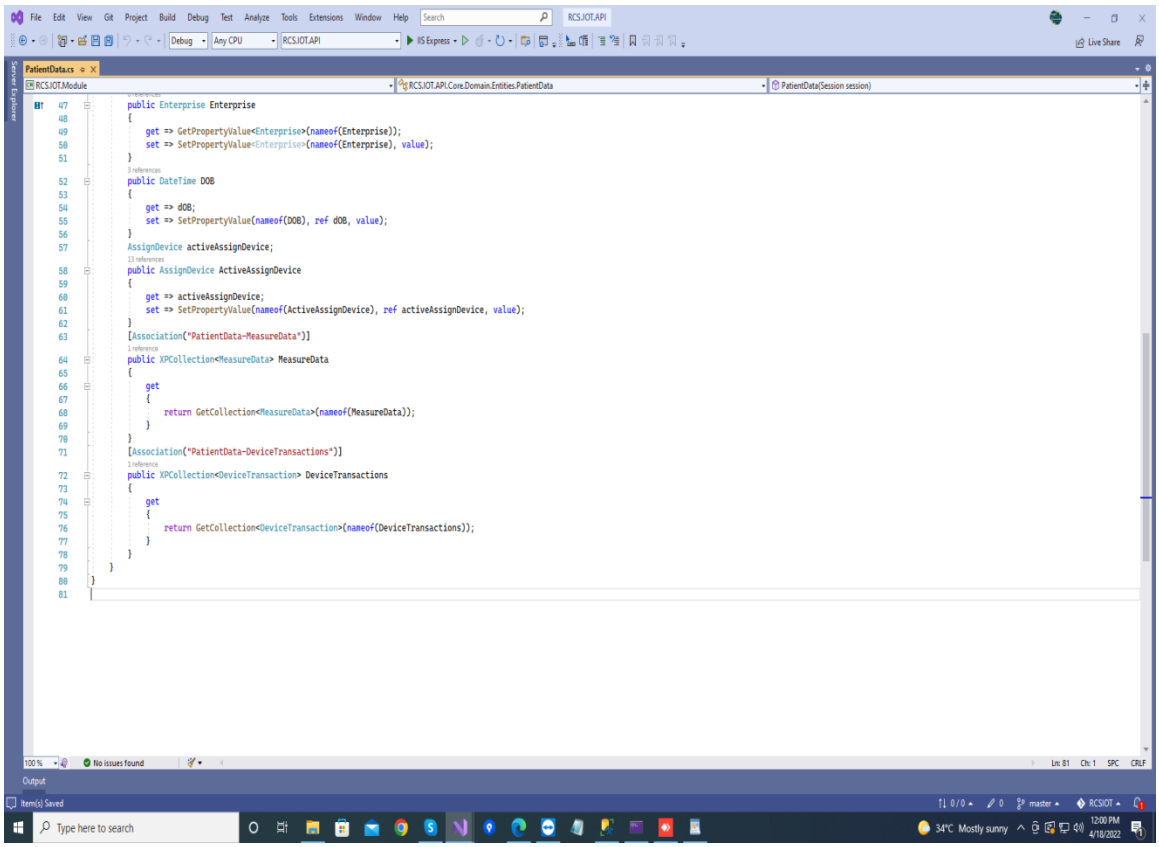


```
        public long? Battery
        {
            get { return GetPropertyValue<long?>(nameof(Battery)); }
            set { SetPropertyValue<long?>(nameof(Battery), value); }
        }
        3 references
        public long? SignalStrength
        {
            get { return GetPropertyValue<long?>(nameof(SignalStrength)); }
            set { SetPropertyValue<long?>(nameof(SignalStrength), value); }
        }

        3 references
        public bool IrregularHeartBeat
        {
            get { return GetPropertyValue<bool>(nameof(IrregularHeartBeat)); }
            set { SetPropertyValue<bool>(nameof(IrregularHeartBeat), value); }
        }
        9 references
        public bool IsInvalidData
        {
            get => GetPropertyValue<bool>(nameof(IsInvalidData));
            set => SetPropertyValue<bool>(nameof(IsInvalidData), value);
        }
        2 references
        public Enterprise Enterprise { get => Patient?.Enterprise; }

        3 references
        public MeasureData(Session session) : base(session) { }
    }
    10 references
    public enum MealType
    {
        Normal,
        BeForeMeal,
        AfterMeal,
        QCMode
    }
}
```

Patient Data:

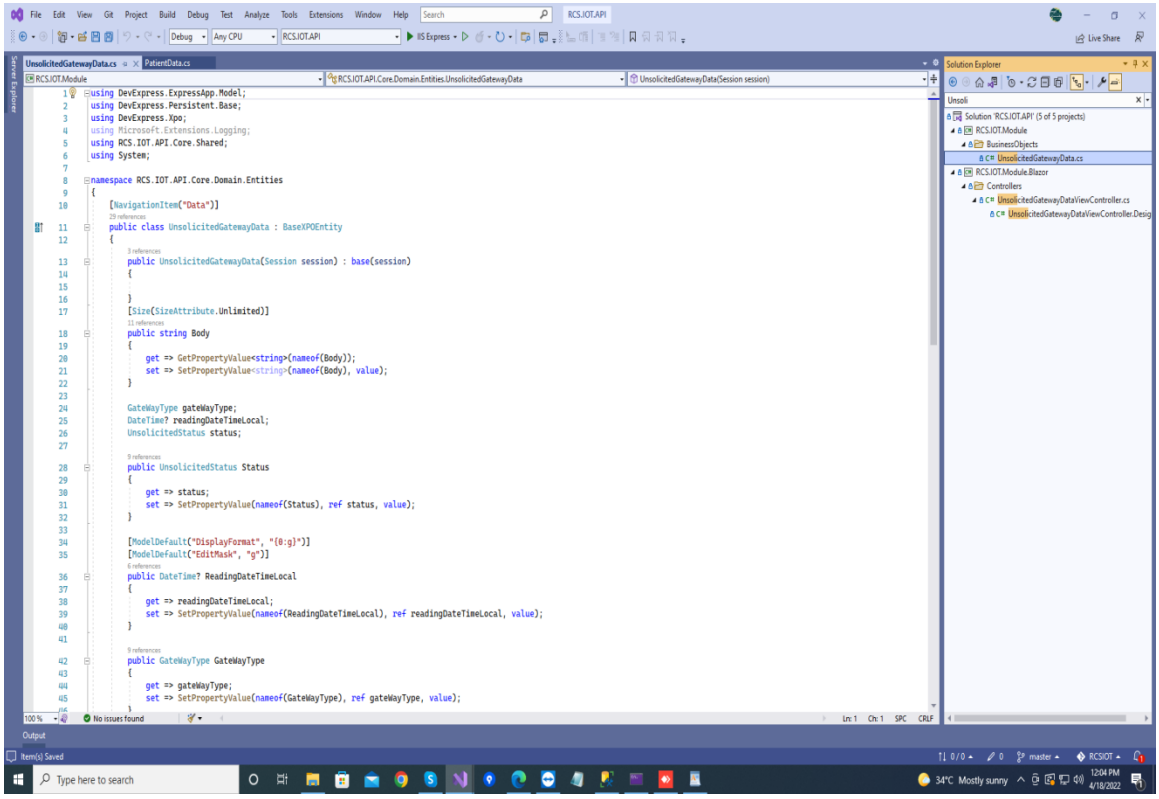


```
using DevExpress.Persistent.Base;
using DevExpress.Xpo;
using RCS.IOT.API.Core.Shared;
using System;
using System.ComponentModel;
using System.Drawing;
namespace RCS.IOT.API.Core.Domain.Entities
{
    [NavigationItem("Data")]
    [DefaultProperty(nameof(Name))]
    10 references
    public class PatientData : BaseXPOEntity, IEnterpriseItem
    {
        1 reference
        public PatientData(Session session) : base(session)
        {

        }

        Guid externalId;
        DateTime dOB;
        string last;
        string first;

        [PersistentAlias("Concat(Iif(IsNull(Last), '', Upper(Last)), ', ', Iif(IsNull(First), '', First))")]
        2 references
        public string Name
        {
            get => Convert.ToString(EvaluateAlias(nameof(Name)));
        }

        5 references
        public Guid ExternalId
        {
            get => externalId;
            set => SetPropertyValue(nameof(ExternalId), ref externalId, value);
        }
        [Size(SizeAttribute.DefaultStringMappingFieldSize)]
        5 references
        public string First
        {
            get => first;
            set => SetPropertyValue(nameof(First), ref first, value);
        }

        [Size(SizeAttribute.DefaultStringMappingFieldSize)]
        5 references
        public string Last
        {
            get => last;
            set => SetPropertyValue(nameof(Last), ref last, value);
        }
```

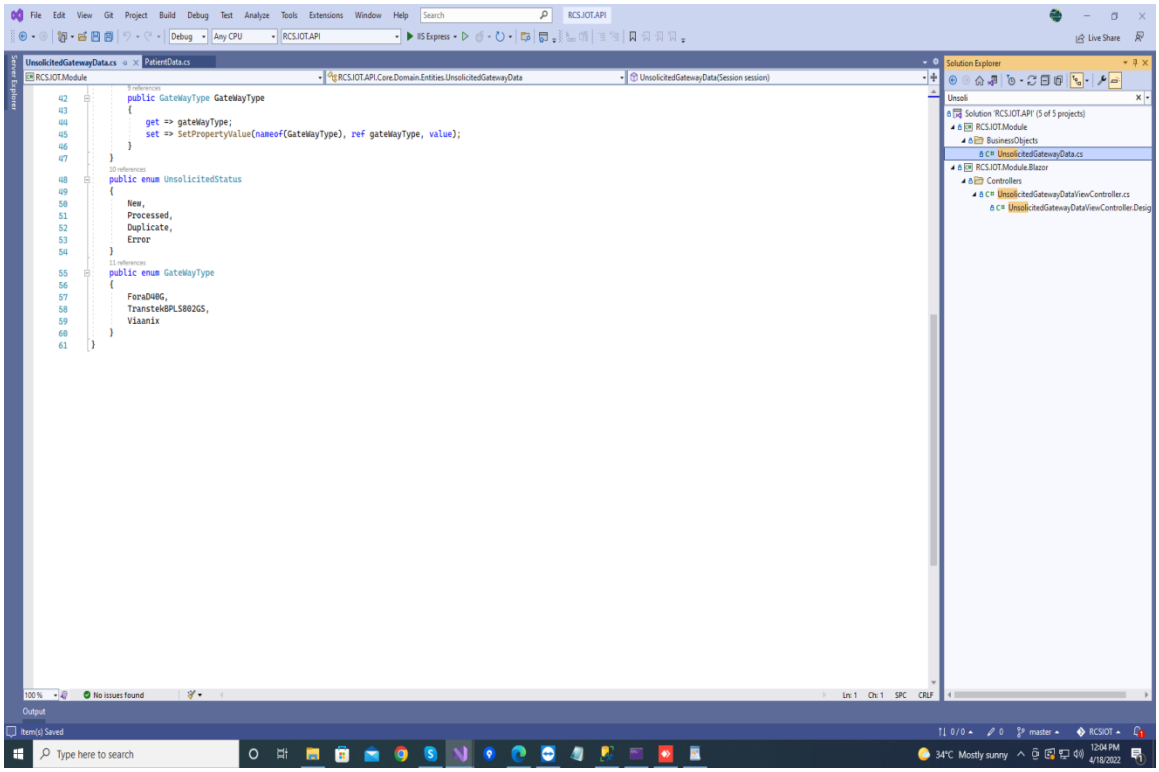


```
        public Enterprise Enterprise
        {
            get => GetPropertyValue<Enterprise>(nameof(Enterprise));
            set => SetPropertyValue<Enterprise>(nameof(Enterprise), value);
        }
        public DateTime DOB
        {
            get => dOB;
            set => SetPropertyValue(nameof(DOB), ref dOB, value);
        }
        AssignDevice activeAssignDevice;
        public AssignDevice ActiveAssignDevice
        {
            get => activeAssignDevice;
            set => SetPropertyValue(nameof(ActiveAssignDevice), ref activeAssignDevice, value);
        }
        [Association("PatientData-MeasureData")]
        public XPCollection<MeasureData> MeasureData
        {
            get
            {
                return GetCollection<MeasureData>(nameof(MeasureData));
            }
        }
        [Association("PatientData-DeviceTransactions")]
        public XPCollection<DeviceTransaction> DeviceTransactions
        {
            get
            {
                return GetCollection<DeviceTransaction>(nameof(DeviceTransactions));
            }
        }
    }
}
```

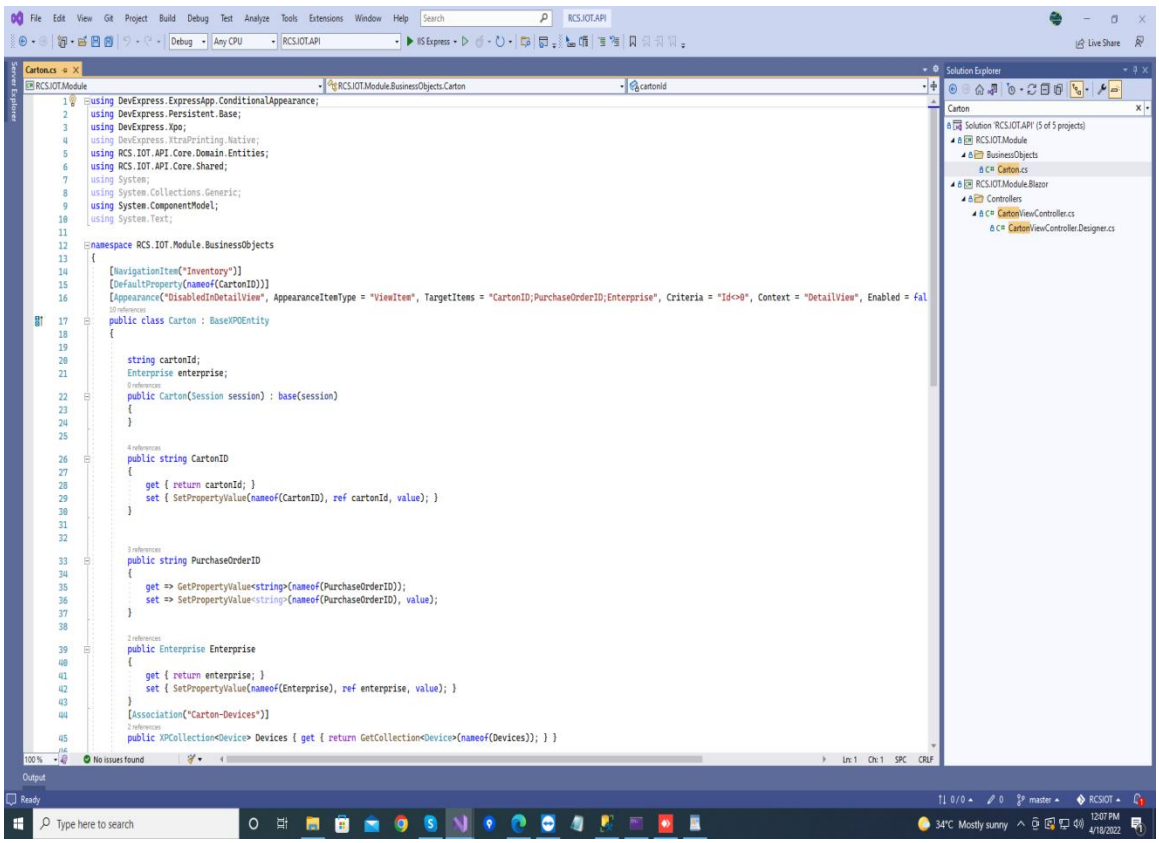
Unsolicited Gateway Data:



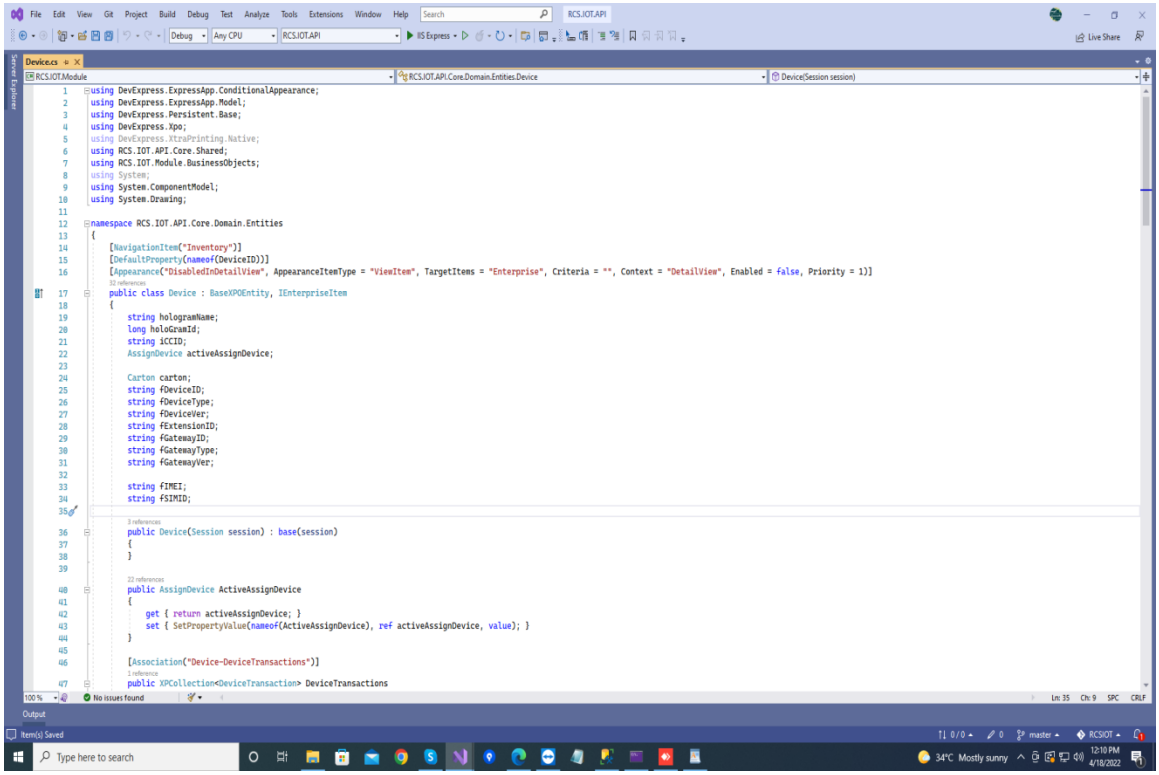
```
using DevExpress.ExpressApp.Model;
using DevExpress.Persistent.Base;
using DevExpress.Xpo;
using Microsoft.Extensions.Logging;
using RCS.IOT.API.Core.Shared;
using System;

namespace RCS.IOT.API.Core.Domain.Entities
{
    [NavigationItem("Data")]
    public class UnsolicitedGatewayData : BaseXPOEntity
    {
        public UnsolicitedGatewayData(Session session) : base(session)
        {

        }
        [Size(SizeAttribute.Unlimited)]
        public string Body
        {
            get => GetPropertyValue<string>(nameof(Body));
            set => SetPropertyValue<string>(nameof(Body), value);
        }

        GateWayType gateWayType;
        DateTime? readingDateTimeLocal;
        UnsolicitedStatus status;

        public UnsolicitedStatus Status
        {
            get => status;
            set => SetPropertyValue(nameof(Status), ref status, value);
        }

        [ModelDefault("DisplayFormat", "{0:g}")]
        [ModelDefault("EditMask", "g")]
        public DateTime? ReadingDateTimeLocal
        {
            get => readingDateTimeLocal;
            set => SetPropertyValue(nameof(ReadingDateTimeLocal), ref readingDateTimeLocal, value);
        }

        public GateWayType GateWayType
        {
            get => gateWayType;
            set => SetPropertyValue(nameof(GateWayType), ref gateWayType, value);
        }
```


UnsolicitedGatewayData.cs
PatientData.cs
public GateWayType GateWayType
{
get => gateWayType;
set => SetPropertyValue(nameof(GateWayType), ref gateWayType, value);
}
}
public enum UnsolicitedStatus
{
New,
Processed,
Duplicate,
Error
}
public enum GateWayType
{
ForaD40G,
TranstekBPLS802GS,
Viaanix
}
}
Solution Explorer
Solution 'RCS.IOT.API' (5 of 5 projects)
RCS.IOT.Module
BusinessObjects
UnsolicitedGatewayData.cs
RCS.IOT.Module.Blazor
Controllers
UnsolicitedGatewayDataViewController.cs
UnsolicitedGatewayDataViewController.Desig
No issues found
Output
Item(s) Saved
Type here to search
34°C Mostly sunny
12:04 PM
4/18/2022

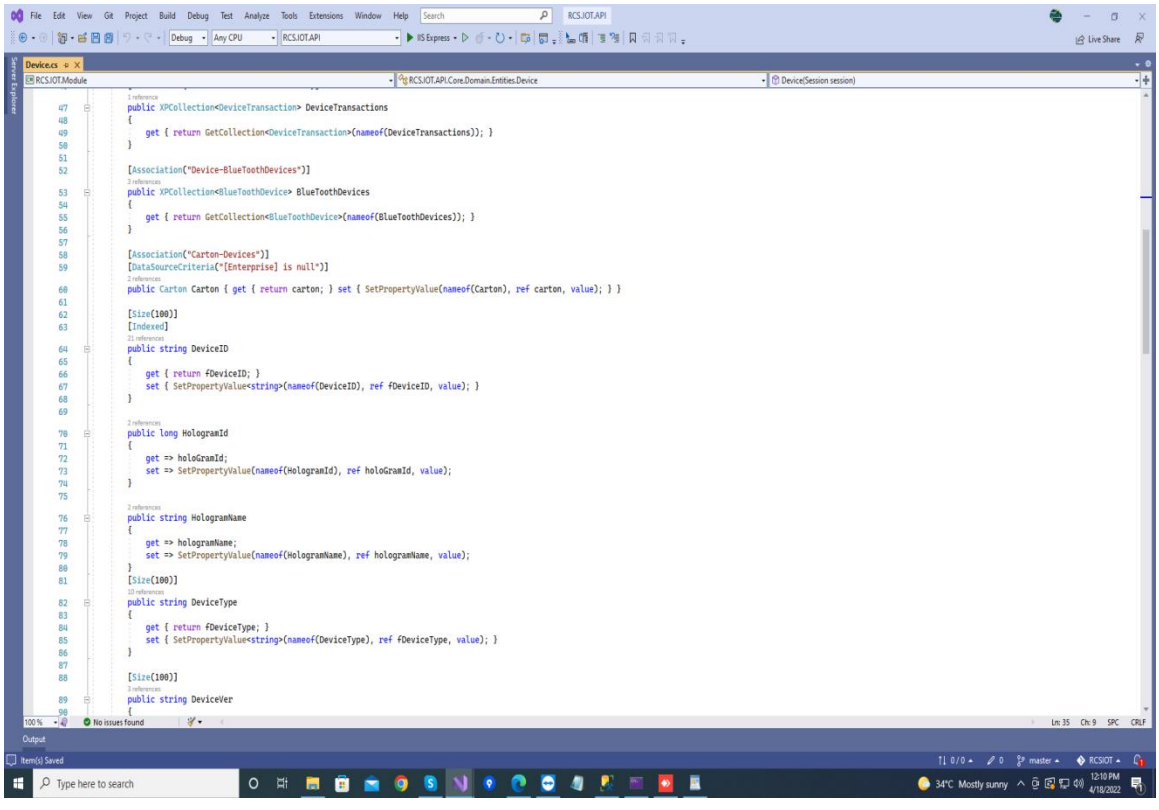
For Carton:


Cartons.cs
using DevExpress.ExpressApp.ConditionalAppearance;
using DevExpress.Persistent.Base;
using DevExpress.Xpo;
using DevExpress.XtraPrinting.Native;
using RCS.IOT.API.Core.Domain.Entities;
using RCS.IOT.API.Core.Shared;
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Text;
namespace RCS.IOT.Module.BusinessObjects
{
[NavigationItem("Inventory")]
[DefaultProperty(nameof(CartonID))]
[Appearance("DisabledInDetailView", AppearanceItemType = "ViewItem", TargetItems = "CartonID;PurchaseOrderID;Enterprise", Criteria = "Id<>0", Context = "DetailView", Enabled = fal
public class Carton : BaseXPOEntity
{
string cartonId;
Enterprise enterprise;
public Carton(Session session) : base(session)
{
}
public string CartonID
{
get { return cartonId; }
set { SetPropertyValue(nameof(CartonID), ref cartonId, value); }
}
public string PurchaseOrderID
{
get => GetPropertyValue<string>(nameof(PurchaseOrderID));
set => SetPropertyValue<string>(nameof(PurchaseOrderID), value);
}
public Enterprise Enterprise
{
get { return enterprise; }
set { SetPropertyValue(nameof(Enterprise), ref enterprise, value); }
}
[Association("Carton-Devices")]
public XPCollection<Device> Devices { get { return GetCollection<Device>(nameof(Devices)); } }
Solution Explorer
Solution 'RCS.IOT.API' (5 of 5 projects)
RCS.IOT.Module
BusinessObjects
Carton.cs
RCS.IOT.Module.Blazor
Controllers
CartonViewController.cs
CartonViewController.Designer.cs
No issues found
Output
Ready
Type here to search
34°C Mostly sunny
12:07 PM
4/18/2022

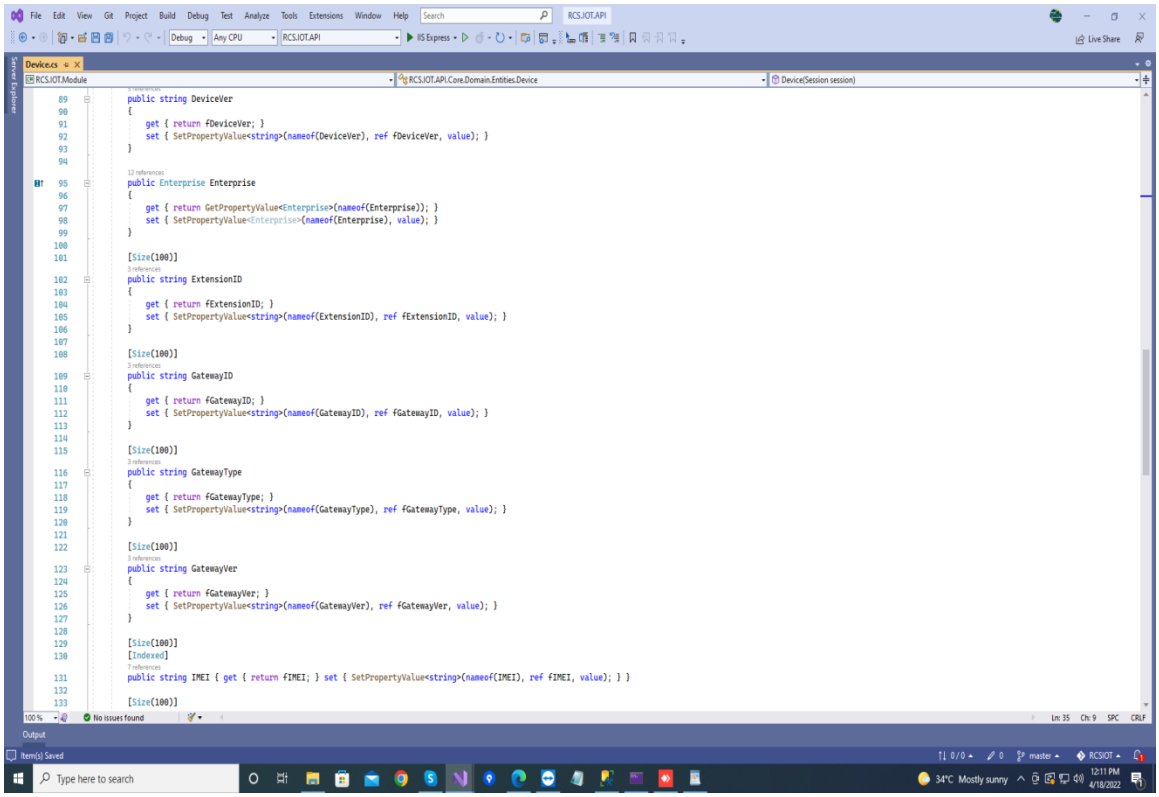
Device:



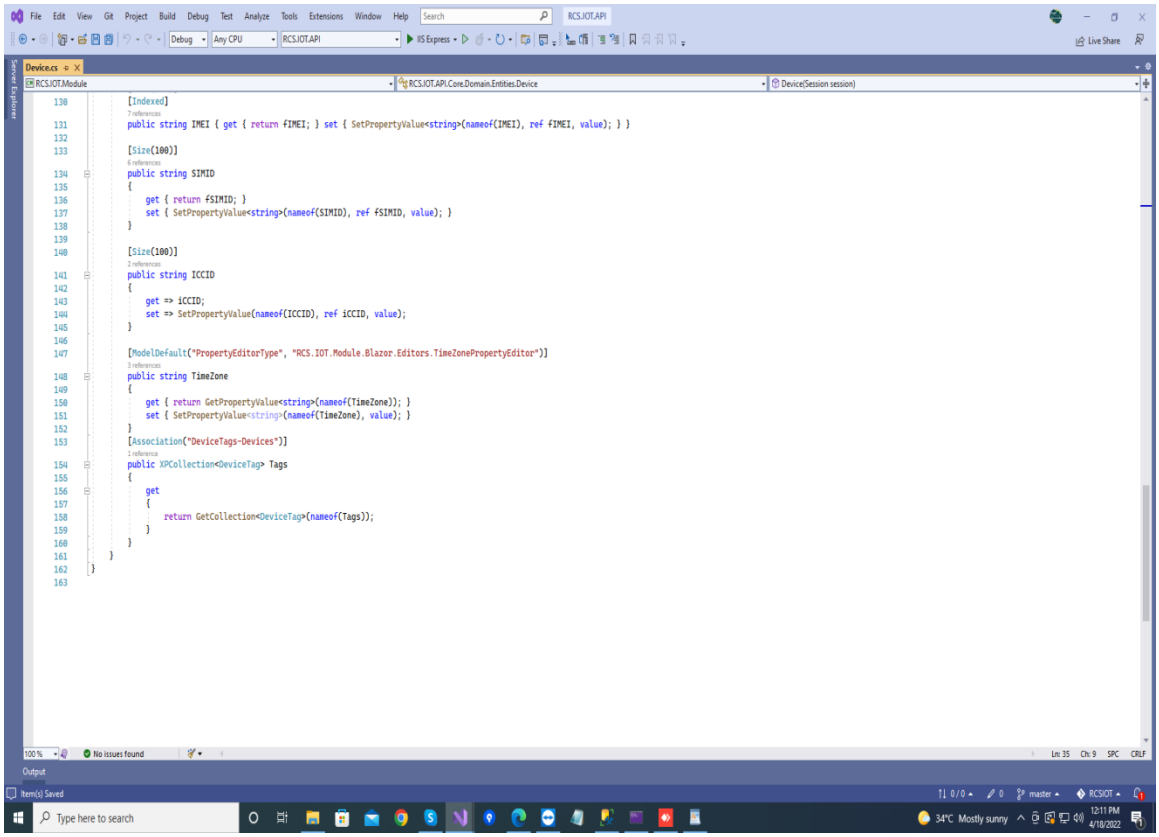
```
using DevExpress.ExpressApp.ConditionalAppearance;
using DevExpress.ExpressApp.Model;
using DevExpress.Persistent.Base;
using DevExpress.Xpo;
using DevExpress.XtraPrinting.Native;
using RCS.IOT.API.Core.Shared;
using RCS.IOT.Module.BusinessObjects;
using System;
using System.ComponentModel;
using System.Drawing;

namespace RCS.IOT.API.Core.Domain.Entities
{
    [NavigationItem("Inventory")]
    [DefaultProperty(nameof(DeviceID))]
    [Appearance("DisabledInDetailView", AppearanceItemType = "ViewItem", TargetItems = "Enterprise", Criteria = "", Context = "DetailView", Enabled = false, Priority = 1)]
    public class Device : BaseXPOEntity, IEnterpriseItem
    {
        string hologramName;
        long holoGramId;
        string iCCID;
        AssignDevice activeAssignDevice;

        Carton carton;
        string fDeviceID;
        string fDeviceType;
        string fDeviceVer;
        string fExtensionID;
        string fGatewayID;
        string fGatewayType;
        string fGatewayVer;

        string fIMEI;
        string fSIMID;

        public Device(Session session) : base(session)
        {
        }

        public AssignDevice ActiveAssignDevice
        {
            get { return activeAssignDevice; }
            set { SetPropertyValue(nameof(ActiveAssignDevice), ref activeAssignDevice, value); }
        }

        [Association("Device-DeviceTransactions")]
        public XPCollection<DeviceTransaction> DeviceTransactions
```



```
        public XPCollection<DeviceTransaction> DeviceTransactions
        {
            get { return GetCollection<DeviceTransaction>(nameof(DeviceTransactions)); }
        }

        [Association("Device-BlueToothDevices")]
        public XPCollection<BlueToothDevice> BlueToothDevices
        {
            get { return GetCollection<BlueToothDevice>(nameof(BlueToothDevices)); }
        }

        [Association("Carton-Devices")]
        [DataSourceCriteria("[Enterprise] is null")]
        public Carton Carton { get { return carton; } set { SetPropertyValue(nameof(Carton), ref carton, value); } }

        [Size(100)]
        [Indexed]
        public string DeviceID
        {
            get { return fDeviceID; }
            set { SetPropertyValue<string>(nameof(DeviceID), ref fDeviceID, value); }
        }

        public long HologramId
        {
            get => holoGramId;
            set => SetPropertyValue(nameof(HologramId), ref holoGramId, value);
        }

        public string HologramName
        {
            get => hologramName;
            set => SetPropertyValue(nameof(HologramName), ref hologramName, value);
        }
        [Size(100)]
        public string DeviceType
        {
            get { return fDeviceType; }
            set { SetPropertyValue<string>(nameof(DeviceType), ref fDeviceType, value); }
        }

        [Size(100)]
        public string DeviceVer
        {
```

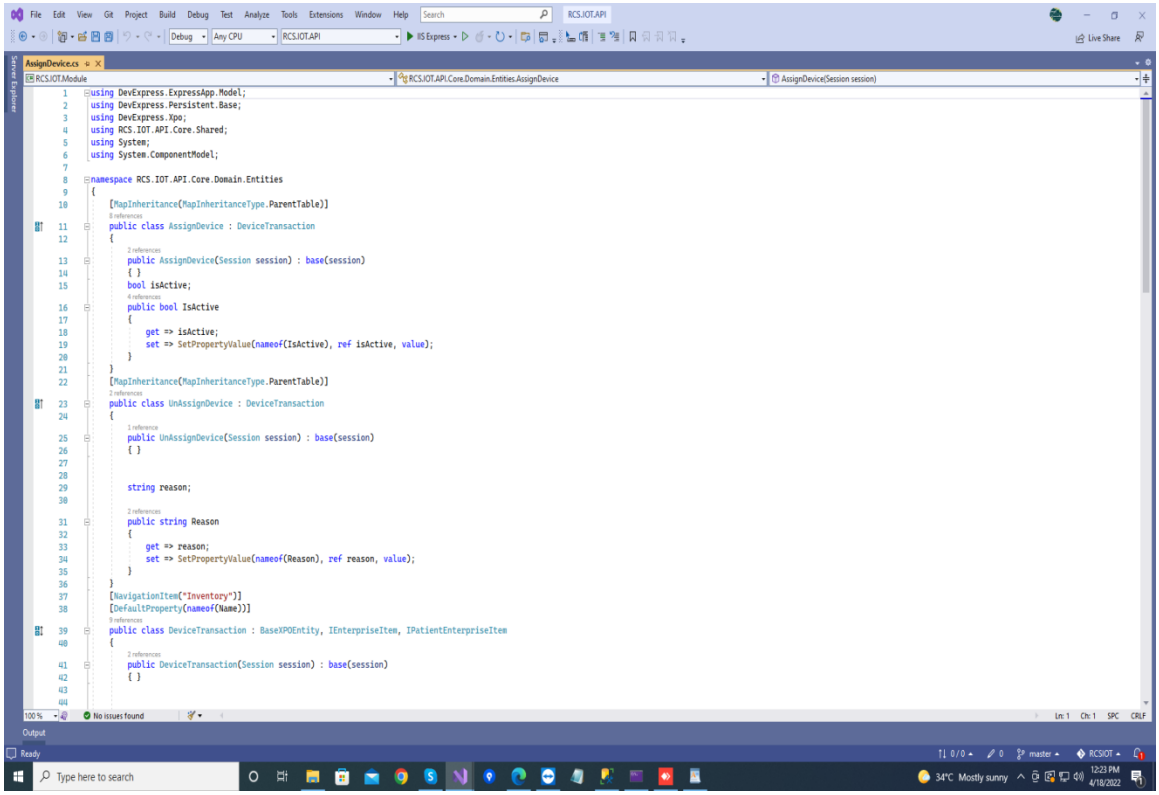


```
        public string DeviceVer
        {
            get { return fDeviceVer; }
            set { SetPropertyValue<string>(nameof(DeviceVer), ref fDeviceVer, value); }
        }

        12 references
        public Enterprise Enterprise
        {
            get { return GetPropertyValue<Enterprise>(nameof(Enterprise)); }
            set { SetPropertyValue<Enterprise>(nameof(Enterprise), value); }
        }

        [Size(100)]
        3 references
        public string ExtensionID
        {
            get { return fExtensionID; }
            set { SetPropertyValue<string>(nameof(ExtensionID), ref fExtensionID, value); }
        }

        [Size(100)]
        3 references
        public string GatewayID
        {
            get { return fGatewayID; }
            set { SetPropertyValue<string>(nameof(GatewayID), ref fGatewayID, value); }
        }

        [Size(100)]
        3 references
        public string GatewayType
        {
            get { return fGatewayType; }
            set { SetPropertyValue<string>(nameof(GatewayType), ref fGatewayType, value); }
        }

        [Size(100)]
        3 references
        public string GatewayVer
        {
            get { return fGatewayVer; }
            set { SetPropertyValue<string>(nameof(GatewayVer), ref fGatewayVer, value); }
        }

        [Size(100)]
        [Indexed]
        7 references
        public string IMEI { get { return fIMEI; } set { SetPropertyValue<string>(nameof(IMEI), ref fIMEI, value); } }

        [Size(100)]
```

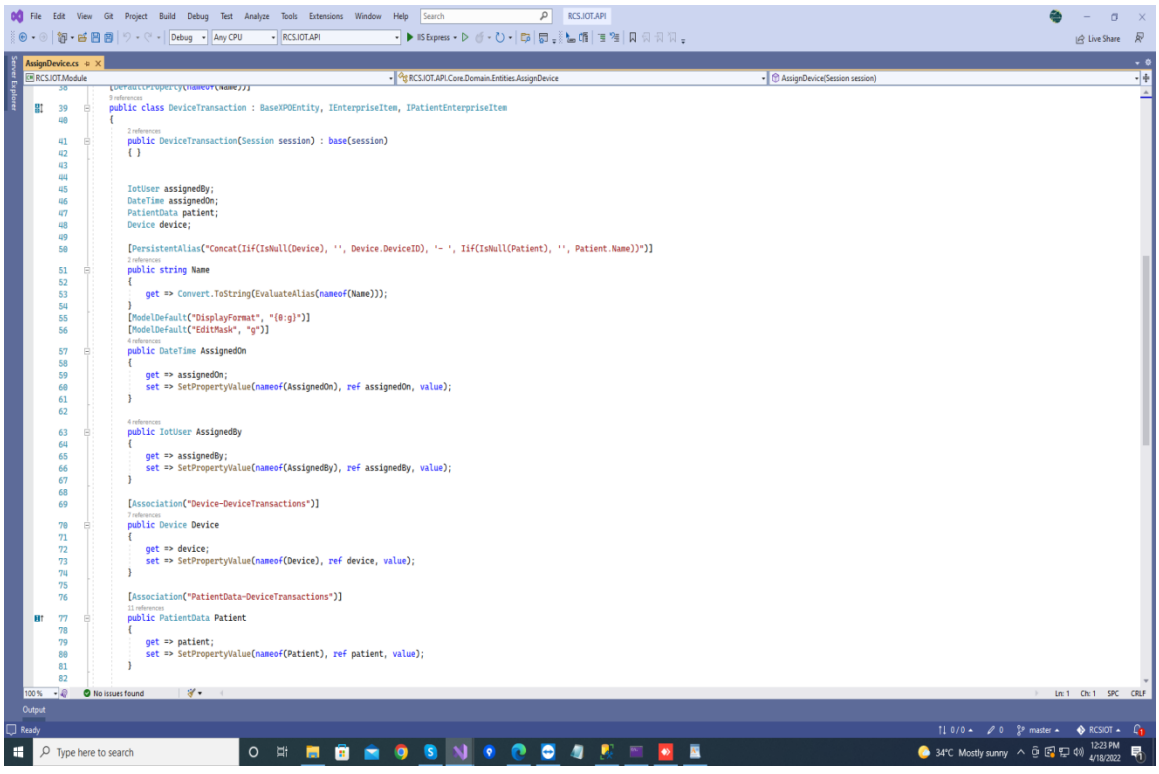


```
        [Indexed]
        7 references
        public string IMEI { get { return fIMEI; } set { SetPropertyValue<string>(nameof(IMEI), ref fIMEI, value); } }

        [Size(100)]
        6 references
        public string SIMID
        {
            get { return fSIMID; }
            set { SetPropertyValue<string>(nameof(SIMID), ref fSIMID, value); }
        }

        [Size(100)]
        2 references
        public string ICCID
        {
            get => iCCID;
            set => SetPropertyValue(nameof(ICCID), ref iCCID, value);
        }

        [ModelDefault("PropertyEditorType", "RCS.IOT.Module.Blazor.Editors.TimeZonePropertyEditor")]
        3 references
        public string TimeZone
        {
            get { return GetPropertyValue<string>(nameof(TimeZone)); }
            set { SetPropertyValue<string>(nameof(TimeZone), value); }
        }
        [Association("DeviceTags-Devices")]
        1 reference
        public XPCollection<DeviceTag> Tags
        {
            get
            {
                return GetCollection<DeviceTag>(nameof(Tags));
            }
        }
    }
}
```

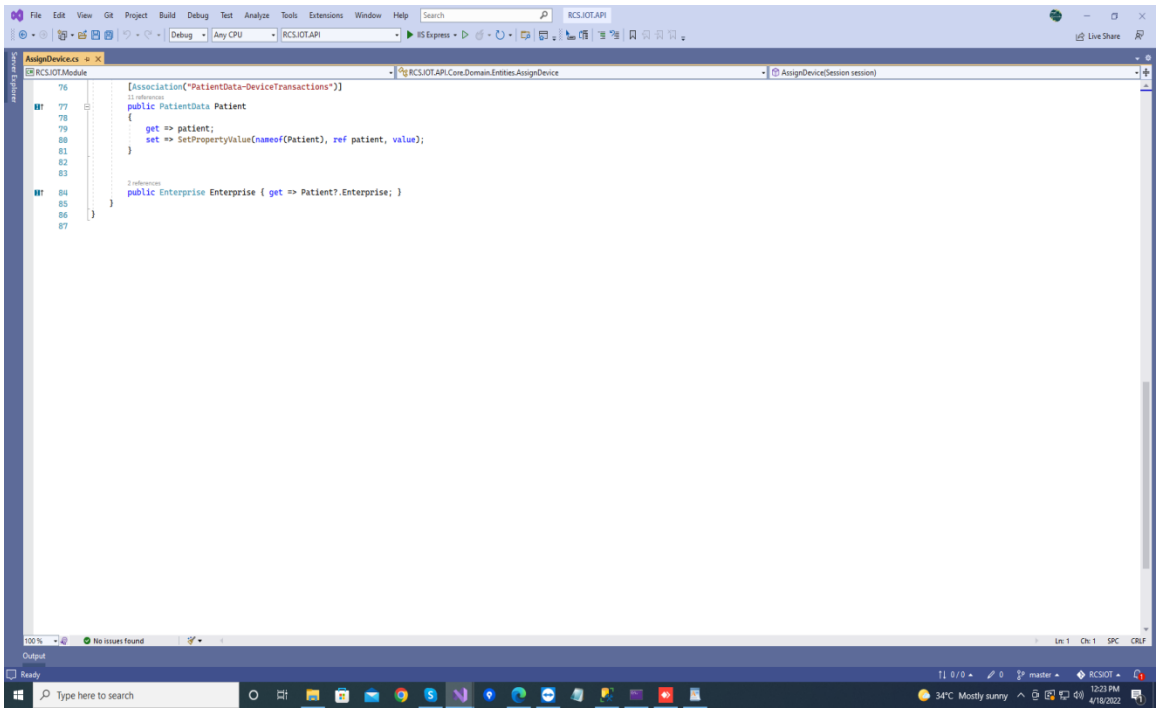
Device Transaction:



```
using DevExpress.ExpressApp.Model;
using DevExpress.Persistent.Base;
using DevExpress.Xpo;
using RCS.IOT.API.Core.Shared;
using System;
using System.ComponentModel;

namespace RCS.IOT.API.Core.Domain.Entities
{
    [MapInheritance(MapInheritanceType.ParentTable)]
    public class AssignDevice : DeviceTransaction
    {
        public AssignDevice(Session session) : base(session)
        { }
        bool isActive;
        public bool IsActive
        {
            get => isActive;
            set => SetPropertyValue(nameof(IsActive), ref isActive, value);
        }
    }
    [MapInheritance(MapInheritanceType.ParentTable)]
    public class UnAssignDevice : DeviceTransaction
    {
        public UnAssignDevice(Session session) : base(session)
        { }


        string reason;

        public string Reason
        {
            get => reason;
            set => SetPropertyValue(nameof(Reason), ref reason, value);
        }
    }
    [NavigationItem("Inventory")]
    [DefaultProperty(nameof(Name))]
    public class DeviceTransaction : BaseXPOEntity, IEnterpriseItem, IPatientEnterpriseItem
    {
        public DeviceTransaction(Session session) : base(session)
        { }
```

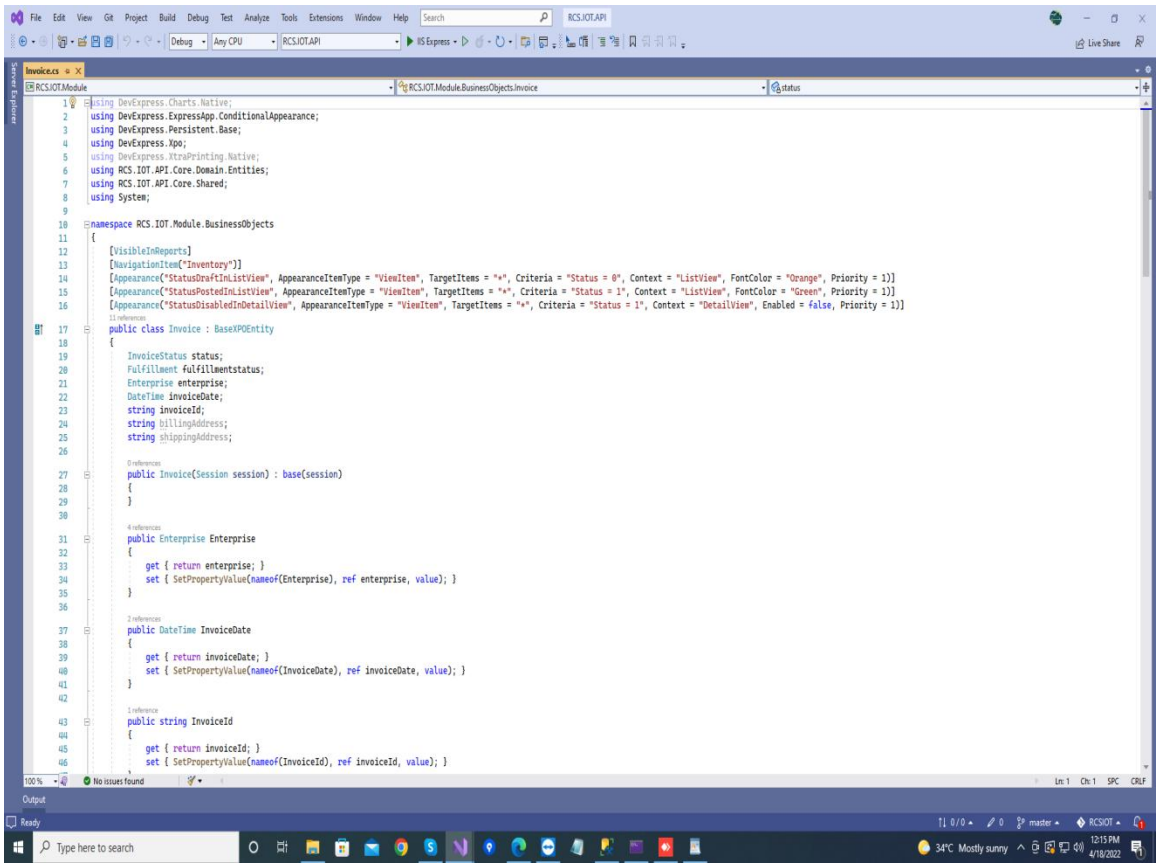


```
    public class DeviceTransaction : BaseXPOEntity, IEnterpriseItem, IPatientEnterpriseItem
    {
        public DeviceTransaction(Session session) : base(session)
        { }


        IotUser assignedBy;
        DateTime assignedOn;
        PatientData patient;
        Device device;

        [PersistentAlias("Concat(Iif(IsNull(Device), '', Device.DeviceID), '- ', Iif(IsNull(Patient), '', Patient.Name))")]
        public string Name
        {
            get => Convert.ToString(EvaluateAlias(nameof(Name)));
        }
        [ModelDefault("DisplayFormat", "{0:g}")]
        [ModelDefault("EditMask", "g")]
        public DateTime AssignedOn
        {
            get => assignedOn;
            set => SetPropertyValue(nameof(AssignedOn), ref assignedOn, value);
        }

        public IotUser AssignedBy
        {
            get => assignedBy;
            set => SetPropertyValue(nameof(AssignedBy), ref assignedBy, value);
        }

        [Association("Device-DeviceTransactions")]
        public Device Device
        {
            get => device;
            set => SetPropertyValue(nameof(Device), ref device, value);
        }

        [Association("PatientData-DeviceTransactions")]
        public PatientData Patient
        {
            get => patient;
            set => SetPropertyValue(nameof(Patient), ref patient, value);
        }
```

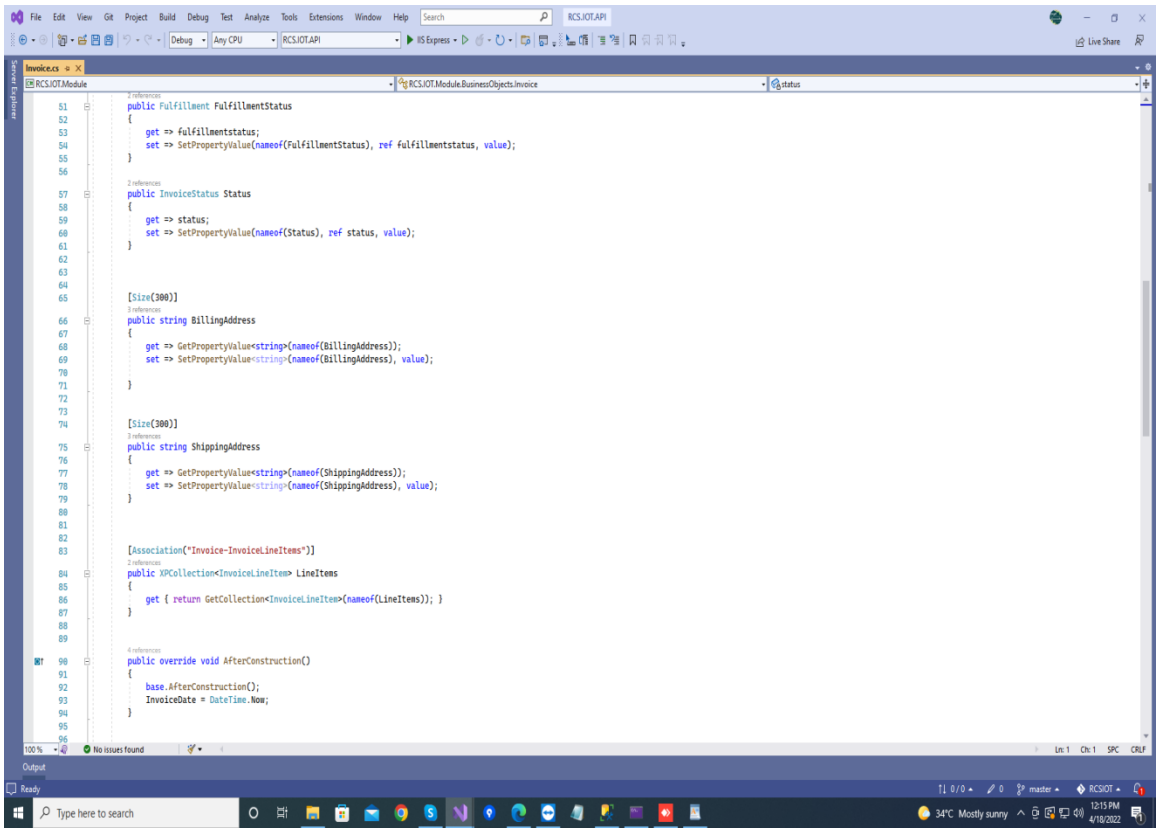


```
[Association("PatientData-DeviceTransactions")]
public PatientData Patient
{
    get => patient;
    set => SetPropertyValue(nameof(Patient), ref patient, value);
}

public Enterprise Enterprise { get => Patient?.Enterprise; }
}
}
```

For Invoice:

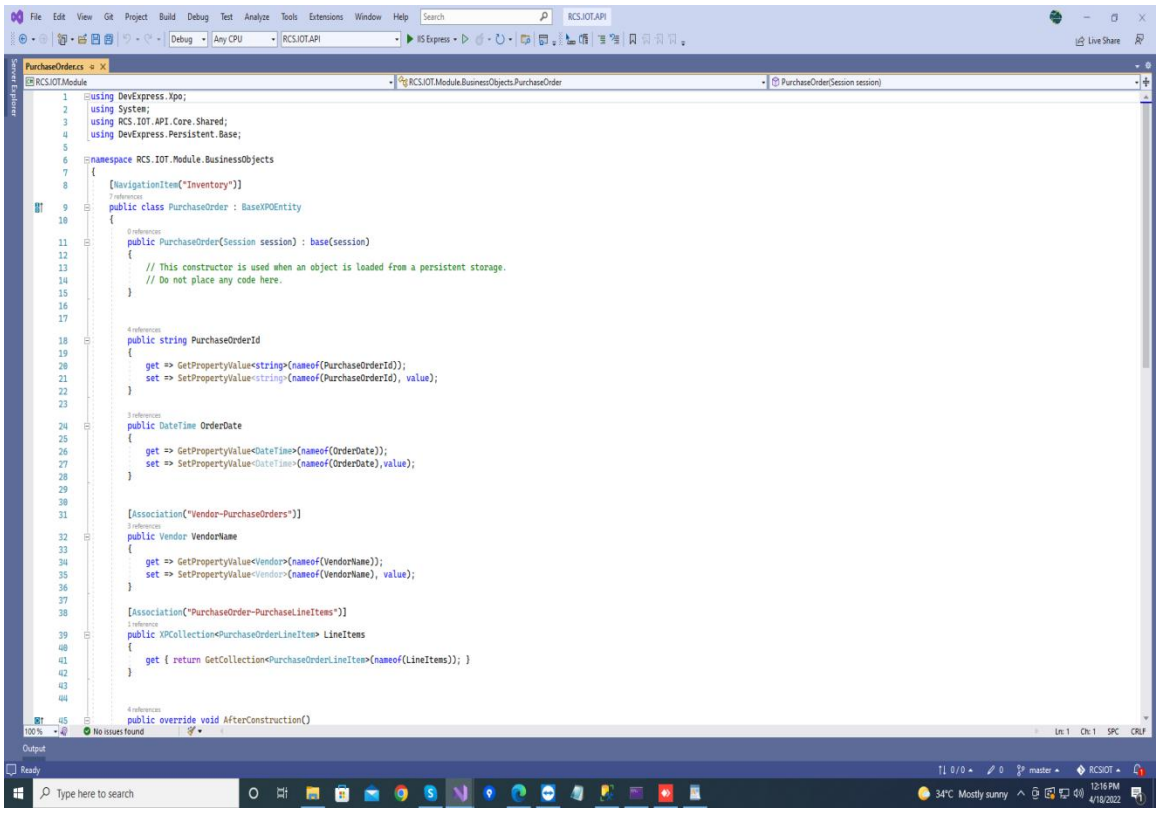


```
using DevExpress.Charts.Native;
using DevExpress.ExpressApp.ConditionalAppearance;
using DevExpress.Persistent.Base;
using DevExpress.Xpo;
using DevExpress.XtraPrinting.Native;
using RCS.IOT.API.Core.Domain.Entities;
using RCS.IOT.API.Core.Shared;
using System;

namespace RCS.IOT.Module.BusinessObjects
{
    [VisibleInReports]
    [NavigationItem("Inventory")]
    [Appearance("StatusDraftInListView", AppearanceItemType = "ViewItem", TargetItems = "*", Criteria = "Status = 0", Context = "ListView", FontColor = "Orange", Priority = 1)]
    [Appearance("StatusPostedInListView", AppearanceItemType = "ViewItem", TargetItems = "*", Criteria = "Status = 1", Context = "ListView", FontColor = "Green", Priority = 1)]
    [Appearance("StatusDisabledInDetailView", AppearanceItemType = "ViewItem", TargetItems = "*", Criteria = "Status = 1", Context = "DetailView", Enabled = false, Priority = 1)]
    public class Invoice : BaseXPOEntity
    {
        InvoiceStatus status;
        Fulfillment fulfillmentstatus;
        Enterprise enterprise;
        DateTime invoiceDate;
        string invoiceId;
        string billingAddress;
        string shippingAddress;

        public Invoice(Session session) : base(session)
        {
        }

        public Enterprise Enterprise
        {
            get { return enterprise; }
            set { SetPropertyValue(nameof(Enterprise), ref enterprise, value); }
        }

        public DateTime InvoiceDate
        {
            get { return invoiceDate; }
            set { SetPropertyValue(nameof(InvoiceDate), ref invoiceDate, value); }
        }

        public string InvoiceId
        {
            get { return invoiceId; }
            set { SetPropertyValue(nameof(InvoiceId), ref invoiceId, value); }
```



```
Invoice.cs
RCS.IOT.Module
RCS.IOT.Module.BusinessObjects.Invoice
status

3 references
public Fulfillment FulfillmentStatus
{
    get => fulfillmentstatus;
    set => SetPropertyValue(nameof(FulfillmentStatus), ref fulfillmentstatus, value);
}

2 references
public InvoiceStatus Status
{
    get => status;
    set => SetPropertyValue(nameof(Status), ref status, value);
}


[Size(300)]
3 references
public string BillingAddress
{
    get => GetPropertyValue<string>(nameof(BillingAddress));
    set => SetPropertyValue<string>(nameof(BillingAddress), value);

}


[Size(300)]
3 references
public string ShippingAddress
{
    get => GetPropertyValue<string>(nameof(ShippingAddress));
    set => SetPropertyValue<string>(nameof(ShippingAddress), value);
}


[Association("Invoice-InvoiceLineItems")]
2 references
public XPCollection<InvoiceLineItem> LineItems
{
    get { return GetCollection<InvoiceLineItem>(nameof(LineItems)); }
}


4 references
public override void AfterConstruction()
{
    base.AfterConstruction();
    InvoiceDate = DateTime.Now;
}
```

For Purchase Order:

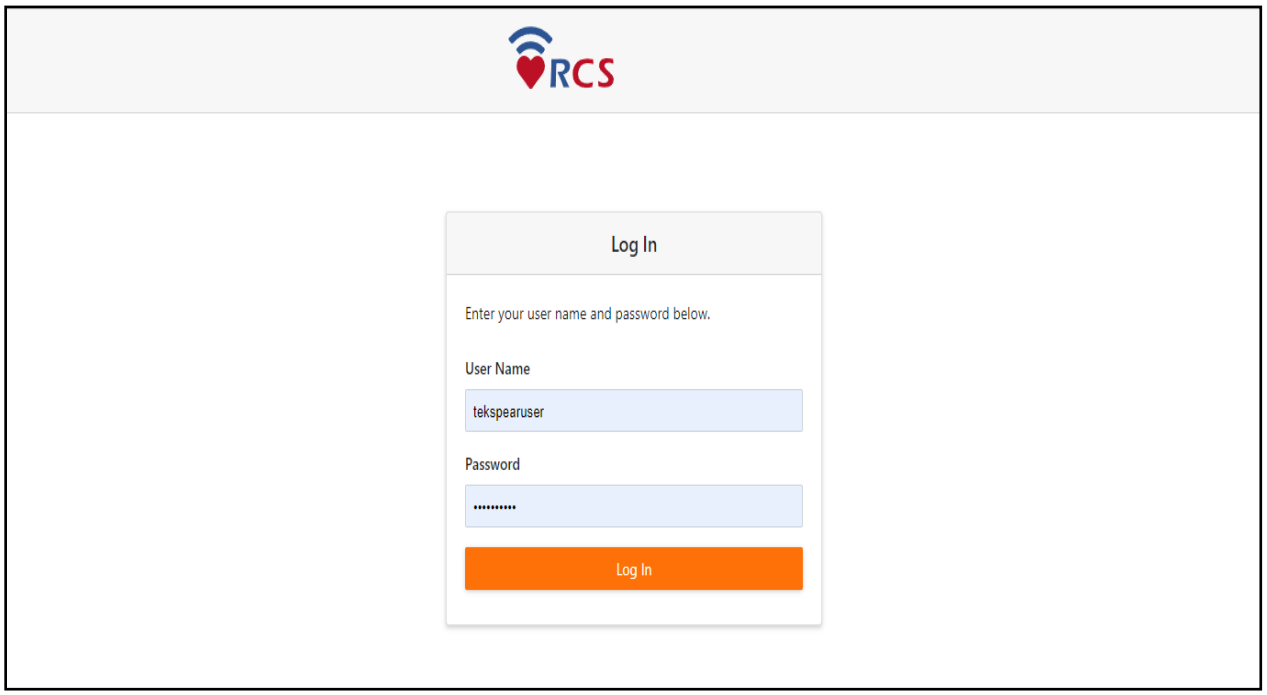


```
PurchaseOrder.cs
RCS.IOT.Module
RCS.IOT.Module.BusinessObjects.PurchaseOrder
PurchaseOrder(Session session)

using DevExpress.Xpo;
using System;
using RCS.IOT.API.Core.Shared;
using DevExpress.Persistent.Base;

namespace RCS.IOT.Module.BusinessObjects
{
    [NavigationItem("Inventory")]
    7 references
    public class PurchaseOrder : BaseXPOEntity
    {
        0 references
        public PurchaseOrder(Session session) : base(session)
        {
            // This constructor is used when an object is loaded from a persistent storage.
            // Do not place any code here.
        }


        4 references
        public string PurchaseOrderId
        {
            get => GetPropertyValue<string>(nameof(PurchaseOrderId));
            set => SetPropertyValue<string>(nameof(PurchaseOrderId), value);
        }

        3 references
        public DateTime OrderDate
        {
            get => GetPropertyValue<DateTime>(nameof(OrderDate));
            set => SetPropertyValue<DateTime>(nameof(OrderDate),value);
        }


        [Association("Vendor-PurchaseOrders")]
        3 references
        public Vendor VendorName
        {
            get => GetPropertyValue<Vendor>(nameof(VendorName));
            set => SetPropertyValue<Vendor>(nameof(VendorName), value);
        }

        [Association("PurchaseOrder-PurchaseLineItems")]
        1 reference
        public XPCollection<PurchaseOrderLineItem> LineItems
        {
            get { return GetCollection<PurchaseOrderLineItem>(nameof(LineItems)); }
        }


        4 references
        public override void AfterConstruction()
```

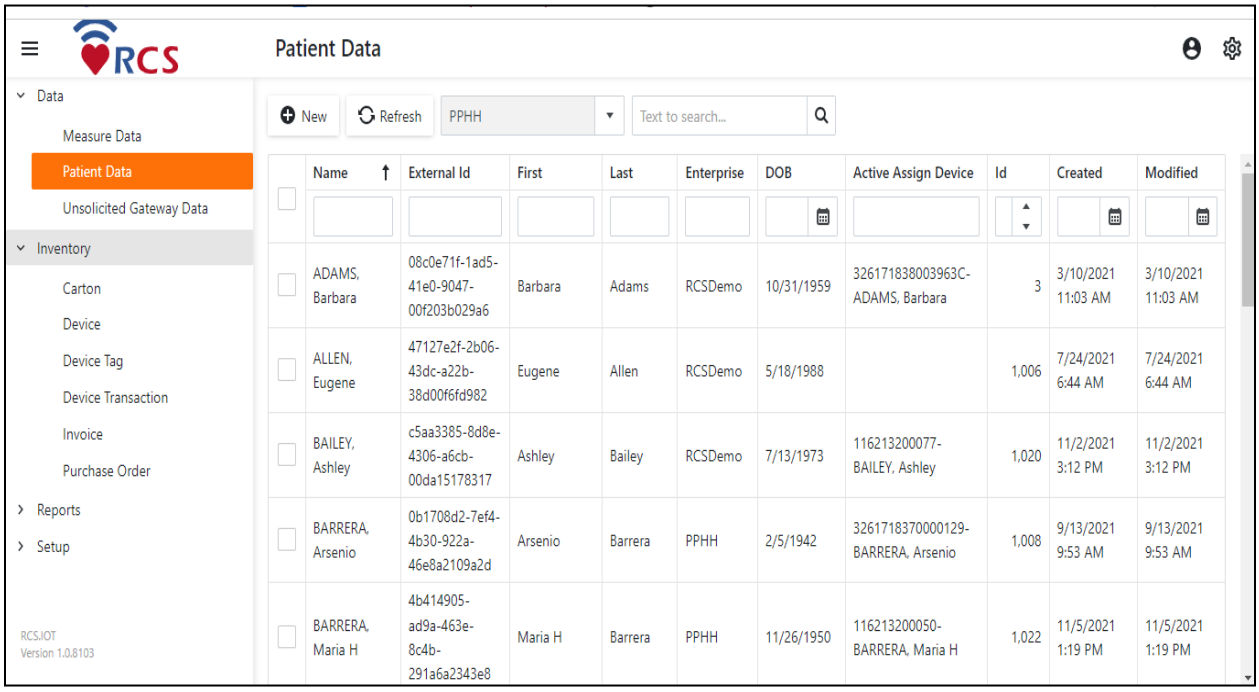
SCREENSHOTS

7. SCREENSHOTS

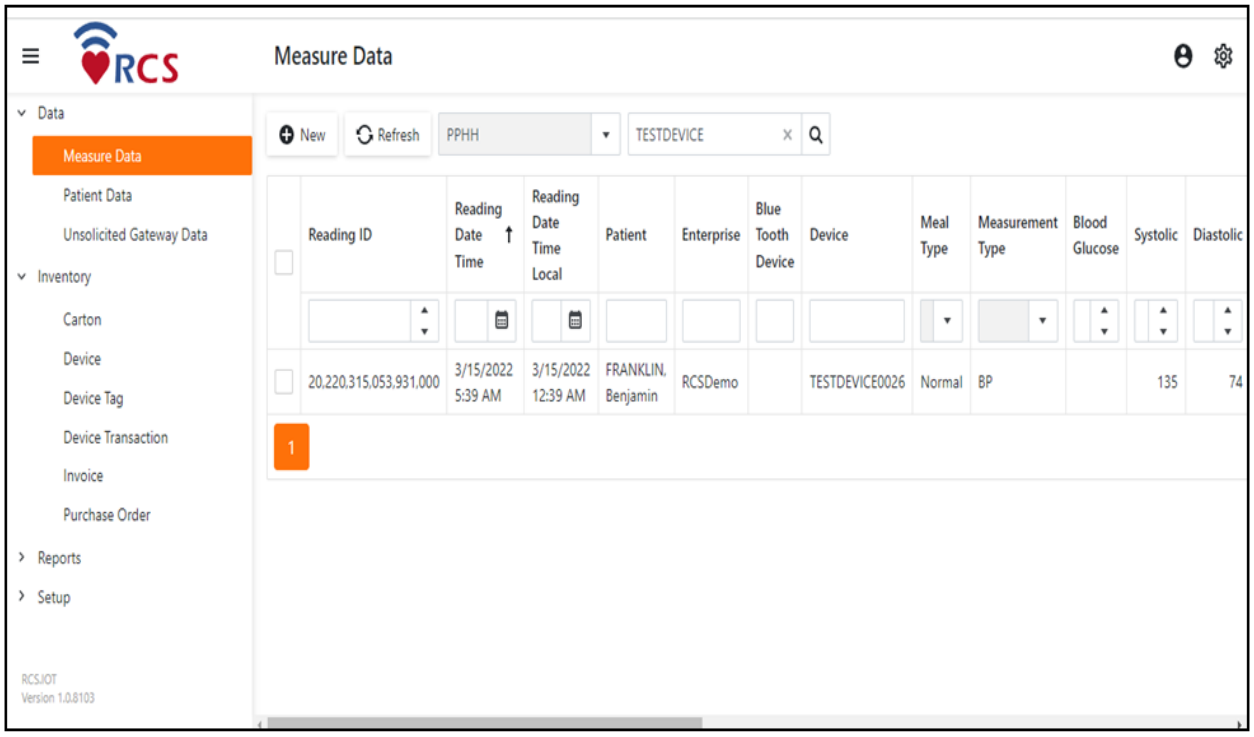
LOGIN PAGE:



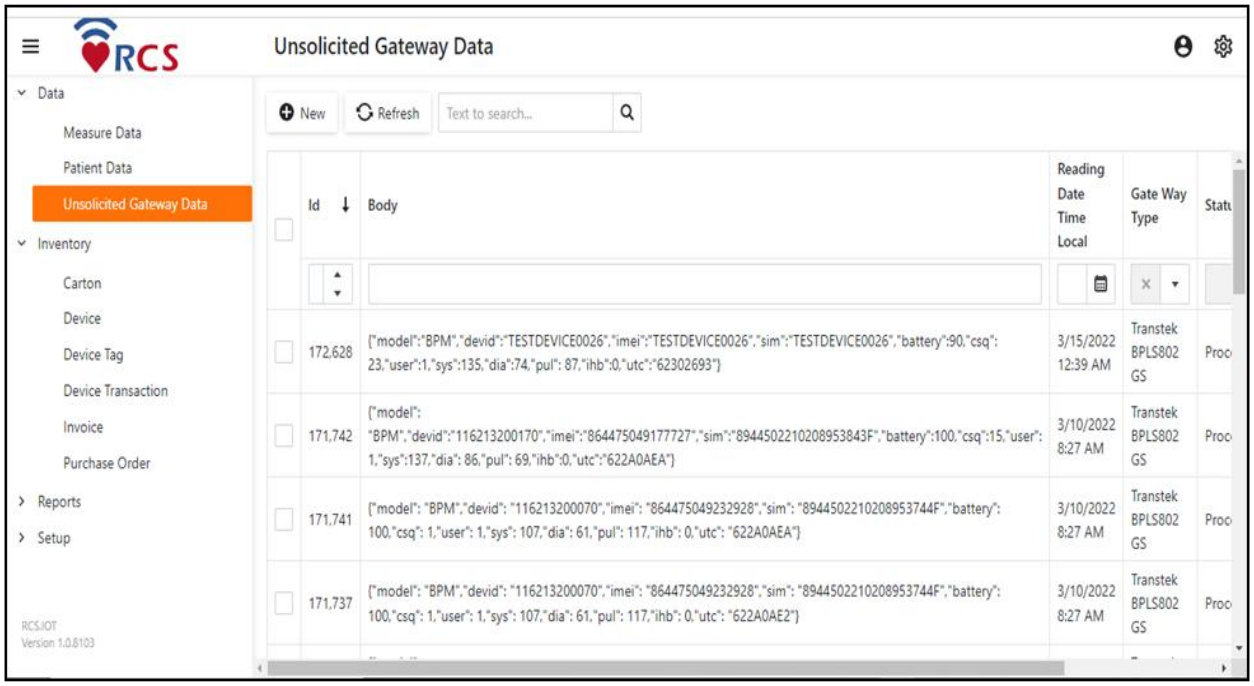
PATIENT DATA:



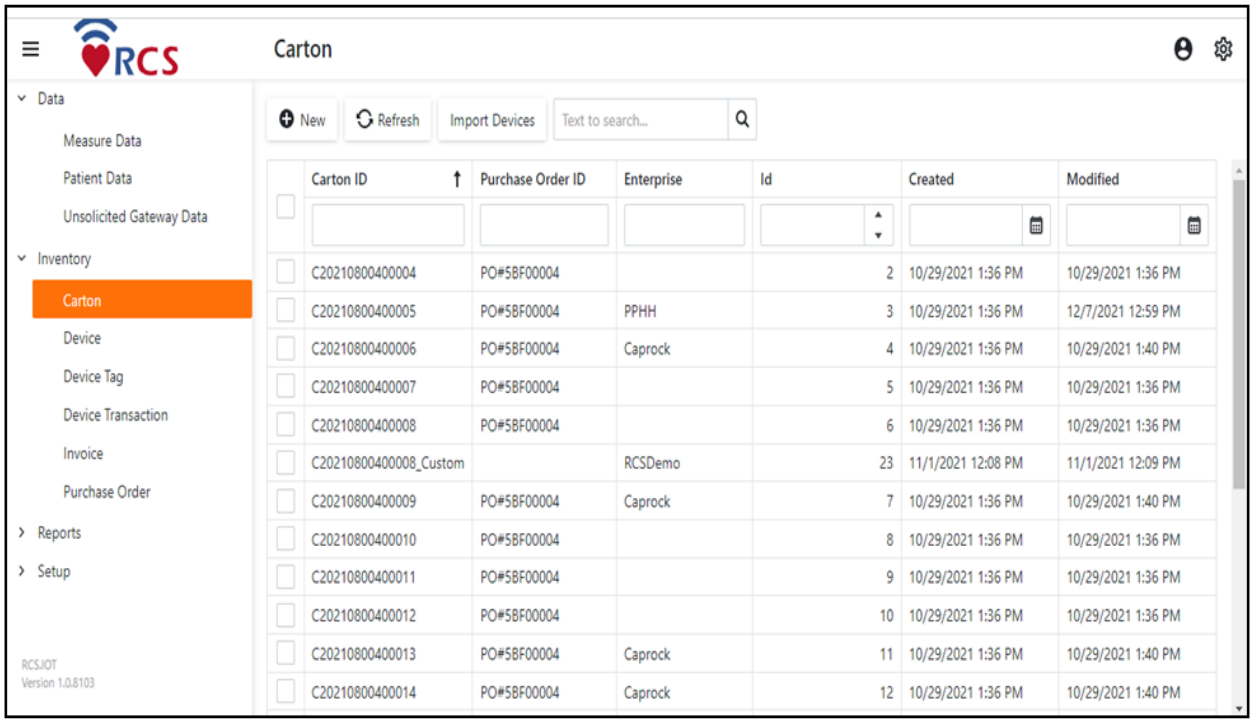
MEASURE DATA:



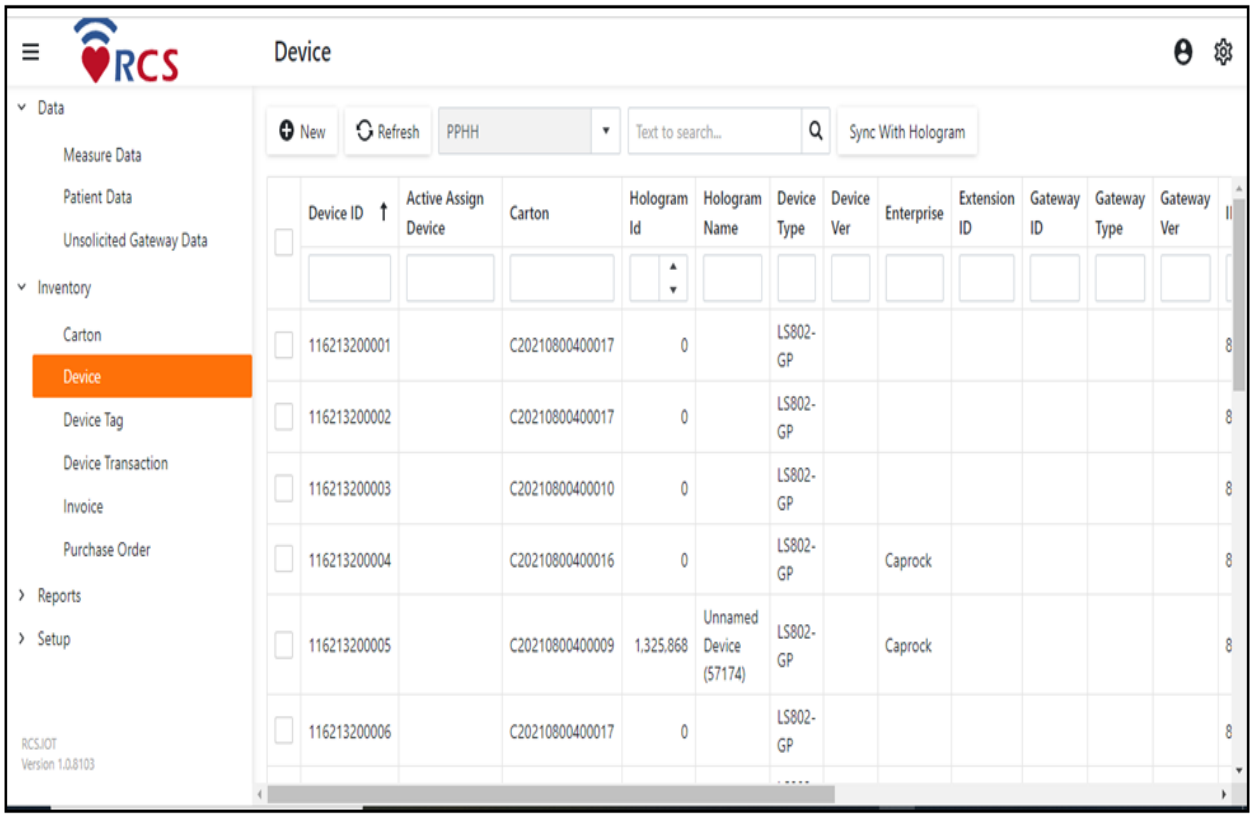
UNSOLICITED GATEWAY DATA:



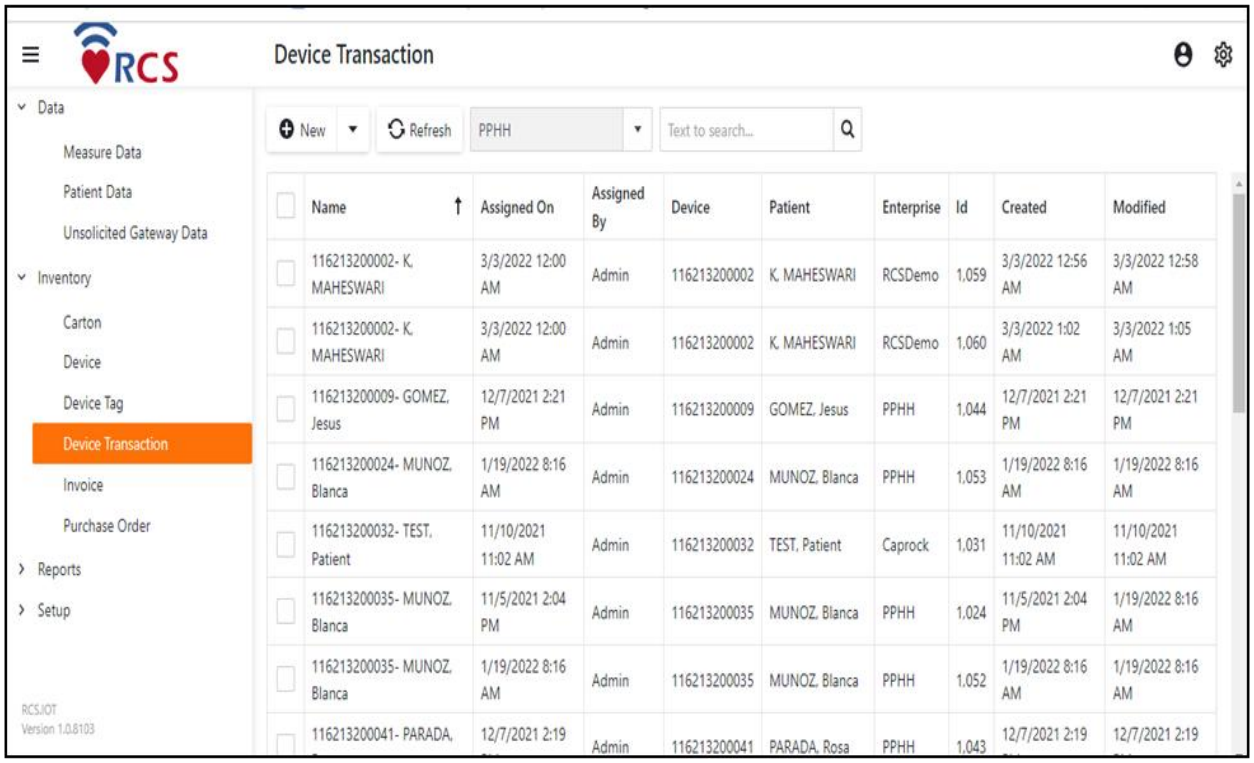
CARTON:



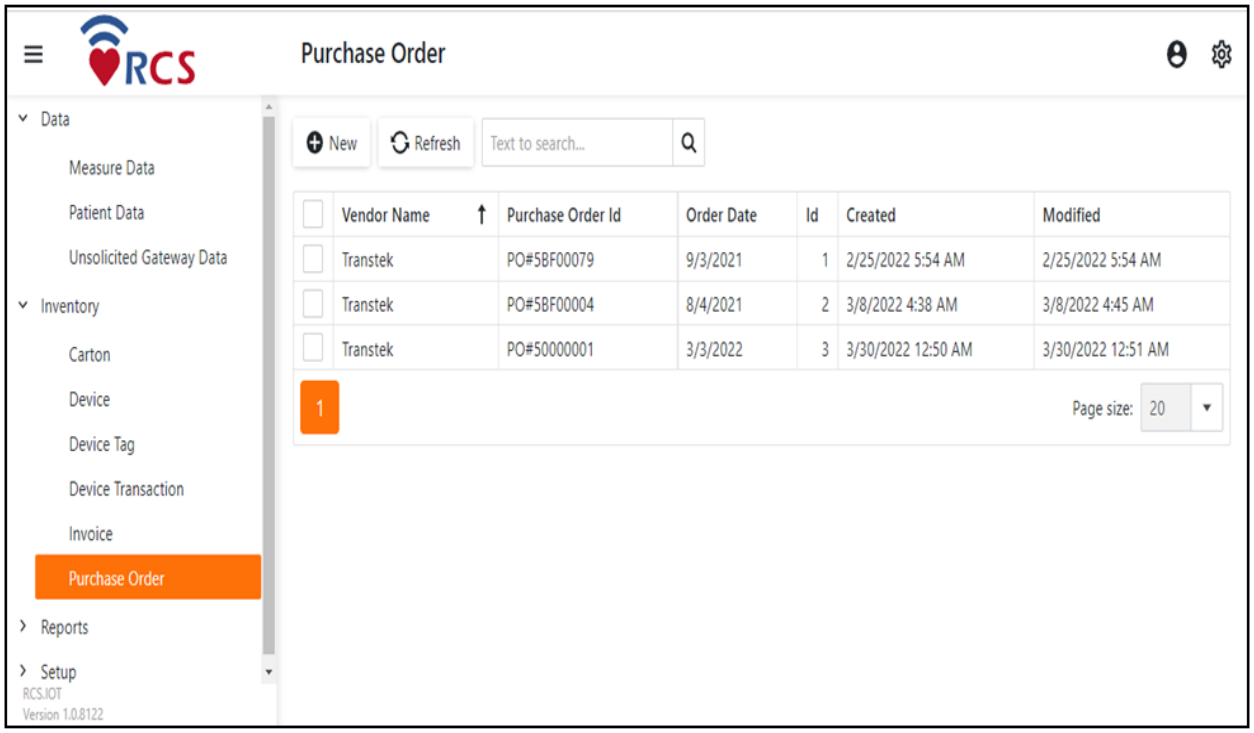
DEVICE:



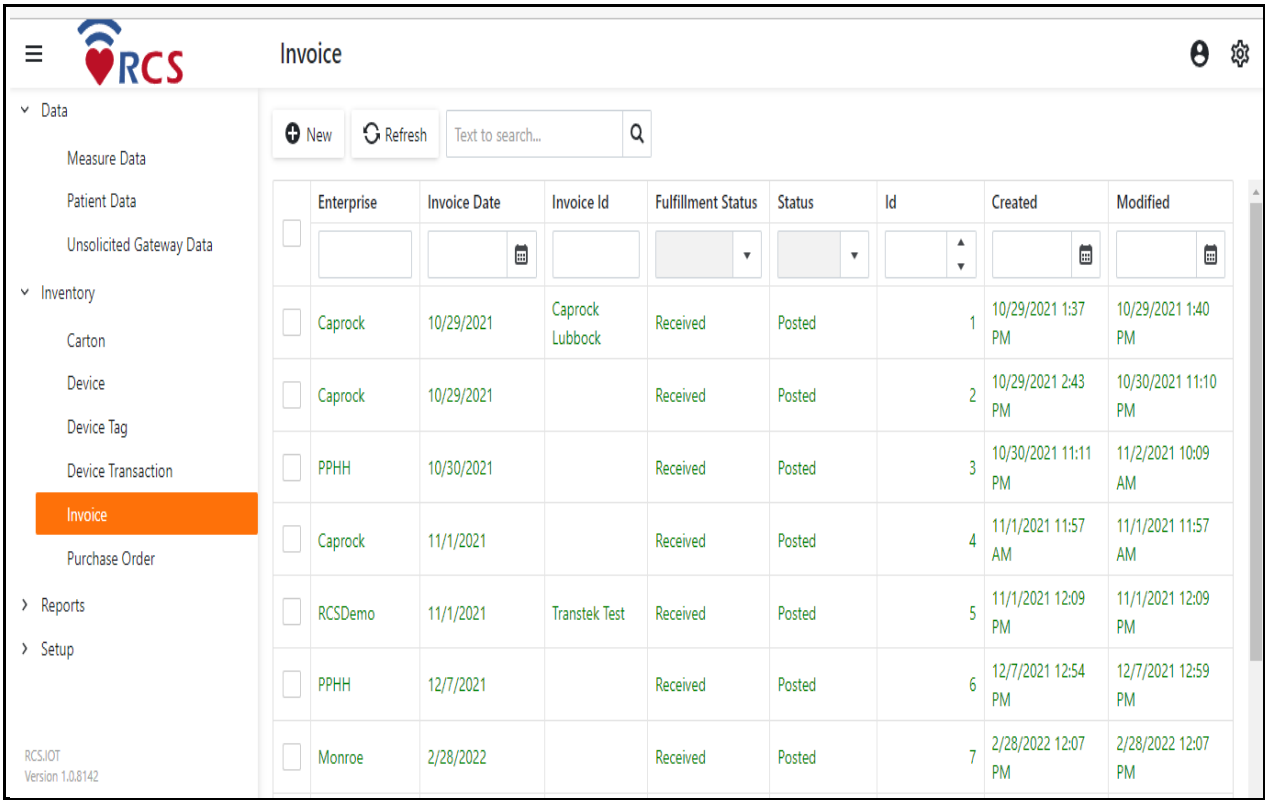
DEVICE TRANSACTION:



PURCHASE ORDER:



INVOICE:


RCS
Invoice
Data
Measure Data
Patient Data
Unsolicited Gateway Data
Inventory
Carton
Device
Device Tag
Device Transaction
Invoice
Purchase Order
Reports
Setup
RCS.IOT
Version 1.0.8142
New
Refresh
Text to search...
Enterprise
Invoice Date
Invoice Id
Fulfillment Status
Status
Id
Created
Modified
Caprock
10/29/2021
Caprock Lubbock
Received
Posted
1
10/29/2021 1:37 PM
10/29/2021 1:40 PM
Caprock
10/29/2021
Received
Posted
2
10/29/2021 2:43 PM
10/30/2021 11:10 PM
PPHH
10/30/2021
Received
Posted
3
10/30/2021 11:11 PM
11/2/2021 10:09 AM
Caprock
11/1/2021
Received
Posted
4
11/1/2021 11:57 AM
11/1/2021 11:57 AM
RCSDemo
11/1/2021
Transtek Test
Received
Posted
5
11/1/2021 12:09 PM
11/1/2021 12:09 PM
PPHH
12/7/2021
Received
Posted
6
12/7/2021 12:54 PM
12/7/2021 12:59 PM
Monroe
2/28/2022
Received
Posted
7
2/28/2022 12:07 PM
2/28/2022 12:07 PM

CONCLUSION

8. CONCLUSION

“INTERNET OF THINGS HUB” is a managed service hosted in the cloud that acts as a central message hub for communication between an IoT application and its attached devices. It is a centralized hub that allows us to collect data and send instructions to our IoT devices from a single hub. The records are kept in an efficient manner since they are all saved in a database from which data can be easily retrieved. Editing is also straightforward. We can connect millions of devices. IoT Hub is a fully managed cloud service that enables reliable and secure bidirectional communications between millions of IoT devices. IoT Hub supports several messaging patterns. It also provides a cloud-hosted solution back end to connect virtually any device. This application works properly and meets all the requirements. Thus, it has become essential to improve the efficiency of your business while seeking innovation.

FUTURE ENHANCEMENT

9. FUTURE ENHANCEMENT

The future enhancement scope for the IOT Hub is huge. We have listed few of those below,

- Integrate IOT with Azure IOTHub on the cloud
- Implement Azure Service bus for uninterrupted device readings
- Implement fulfillment module to send devices to the enterprises
- Enhancing the application to support Vitals360 device which is capable of doing BP,BG, Temperature, EKG, SPO2

BIBLIOGRAPHY

BIBLIOGRAPHY

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ONLINE EXAM SURVEILLANCE USING IMAGE PROCESSING

A project submitted to

ST. MARY'S COLLEGE (Autonomous), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

In partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

P. RADHA

Reg.No.: 20SPCS16

Under the Supervision and Guidance of

Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D.,

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi-628001

MAY 2022

CERTIFICATE

This is to certify that this project work entitled **"ONLINE EXAM SURVEILLANCE USING IMAGE PROCESSING"** is submitted to **St. Mary's College (Autonomous),** Thoothukudi affiliated to Manonmaniam Sundaranar University, Tirunelveli, in partial fulfillment for the award of the degree of Master of Science in **Computer Science** for the work done during the year 2021-2022 by **P. RADHA (Reg. No.: 20SPCS16).**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do here by declare that, the project entitled "**ONLINE EXAM SURVEILLANCE USING IMAGE PROCESSING"** submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D.,** Assistant Professor, PG Department of Computer Science (SSC), St.Mary's College (Autonomous), Thoothukudi**.**

Station: Thoothukudi **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani , Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and Co-ordinator, PG Department of Computer Science (SSC) for her support and counsel.

I express my hearty thanks to my guide Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC), for her support and counsel. For her Valuable suggestions, gentle guidance, enthusiastic ideas to carry out and complete my work entirely.

I also express my boundless thanks to Ms. A. Jenitta Jebamalar M.Sc. (IT)., M.Sc. (CS)., M.Phil., B.Ed., Assistant Professor, PG Department of Computer Science (SSC), for their kind cooperation in successful completion of the project.

I am much indebted to Dr. P. Johnson Durai Raj for his untiring effort, immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

ABSTRACT

Online examinations are conducted throughout the world in order to assess the students/participants in terms of various metrics. To grade the participant examination marks will be used by the evaluator. According to the student's perspective they used to do some malpractices to boost their marks. To avoid and monitor such malpractices the automatic alarm system using image processing is proposed in this work. First the input frame is extracted from video and face will be recognized. In order to check the students' attention, students' eyes are tracked. If any tracking abnormalities defected then a tolerance Score will be increased. Once the tolerance score reaches the threshold subsequently alarm will be raised. So this alert system is extremely useful for the online examination for surveillance purpose.

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2	SYSTEM SPECIFICATION	2
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4	MODULE DESCRIPTION	11
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6	SYSTEM ANALYSIS	14
7	SYSTEM DESIGN	15
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12	FUTURE ENHANCEMENT	30
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1. INTRODUCTION

Online tests can detect cheating if students cheat or violate their academic integrity policies. They catch cheats by using proctoring software, cameras, and IP monitoring. However, without proctoring, online tests cannot detect if you cheated if you do it smartly or involve professionals to write your work. Online examinations are conducted throughout the world in order to assess the students/participants in terms of various metrics. To grade the participant examination marks will be used by the evaluator. According to the student's perspective they used to do some malpractices to boost their marks. To avoid and monitor such malpractices the automatic alarm system using image processing is proposed in this work. First the input frame is extracted from video and face will be recognized. In order to check the students' attention, students' eyes are tracked. If any tracking abnormalities defected, then a tolerance Score will be increased. As a result, some students will write exams online via remote proctoring platforms that surveillance their activities. Proctoring tools can monitor eye movements, capture students' keystrokes, record their screens and track their searches as well as their home environments and physical behaviours. This is very similar to eye detection. If the user turns his/her head the distances between the points increases and if the increase in distance is more than a certain value for at least three outer pairs and two inner pairs then infringement is reported. If the count is not equal to an alarm can be raised.

2. SYSTEM SPECIFICATION

HARDWARE REQUIREMENTS

- Processor - Pentium –IV
- Speed - 1.1 GHz
- RAM - 512 MB (min)
- Hard Disk - 40 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA
- Camera - Web Camera

SOFTWARE REQUIREMENTS

- Operating System: Windows XP or Win7
- Tools: Python, OpenCV
- Document: MS-Office 2007

Python

Python is a computer programming language often used to build websites and software, automate tasks, and conduct data analysis. Python is a general-purpose language, meaning it can be used to create a variety of different programs and is not specialized for any specific problems. This versatility, along with its beginner-friendliness. Python is commonly used for developing websites and software, task automation, data analysis and data visualization. Since it is relatively easy to learn. Python also has number of libraries that enable coders to write programs for data analysis and machine learning more quickly and efficiently. Python has become a stable in data science, allowing data analysts and other professionals to use the language to conduct complex statistical calculations, create data visualizations, build machine learning algorithms, manipulate and analyse data and complete other data related tasks.

Libraries

Python's large standard library provides tools suited to many tasks, and is commonly cited as one of its greatest strengths. For Internet-facing applications, many standard formats and protocols such as MIME and HTTP are supported. It includes modules for creating graphical user interfaces, connecting to relational databases, generating pseudorandom numbers, arithmetic with arbitrary-precision decimals, manipulating regular expressions, and unit testing.

Some parts of the standard library are covered by specifications—for example, the Web Server Gateway Interface (WSGI) implementation wsgiref follows PEP 333—but most are specified by their code, internal documentation, and test suites. However, because most of the standard library is cross-platform Python code, only a few modules need altering or rewriting for variant implementations.

As of January 2022, the Python Package Index (PyPI), the official repository for third-party Python software, contains over 350,000 packages with a wide range of functionality, including:

- Automation
- Data analytics
- Databases
- Documentation
- Graphical user interfaces
- Image processing

- Machine learning
- Mobile apps

OpenCV

OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products. Being a BSD licensed product, OpenCV makes it easy for business to utilize and modify the code. The library has more than 2500 optimized algorithms, which includes a comprehensive set of both classic and state-of-art computer vision and machine learning algorithms. These algorithms can be used to detect and recognize faces, identify objects, classify human actions in videos, track camera movements, track moving objects, extract 3D models of objects, produce 3D point clouds from stereo cameras, stitch images together to produce a high-resolution image of an entire scene, find similar images from an image database, follow eye movements. The library is used extensively in companies, research groups and by government bodies.

OpenCV is a great tool for image processing and performing computer vision tasks. It is an open-source library that can be used to perform tasks like face detection, objection tracking, landmark detection, and much more. It supports multiple languages including python, java C++. Although, for this article, we will be limiting to python only.

The library is equipped with hundreds of useful functions and algorithms, which are all freely available to us. Some of these functions are really common and are used in almost every computer vision task. Whereas many of the functions are still unexplored and haven't received much attention yet.

OpenCv comes with many powerful video editing functions. In current scenario, techniques such as image scanning, face recognition can be accomplished using OpenCV.

Image Analysis is a very common field in the area of Computer Vision. It is the extraction of meaningful information from videos or images. OpenCv library can be used to perform multiple operations on videos.

Modules Needed

- import cv2
- import os

NumPy

NumPy stands for Numerical Python. NumPy is a Python library used for working with arrays. It also has functions for working in domain of linear algebra, Fourier transform, and matrices. It is an open-source project and you can use it freely. NumPy is a Python library and is written partially in Python, but most of the parts that require fasts computation are written in C or C++. NumPy aims to provide an array object that is up to 50x faster than traditional Python lists.

NumPy – Indexing & Slicing

Contents of ndarray object can be accessed and modified by indexing or slicing, just like Python's in-built container objects.

As mentioned earlier, items in ndarray object follows zero-based index. Three types of indexing methods are available − field access, basic slicing **and** advanced indexing**.**

Basic slicing is an extension of Python's basic concept of slicing to n dimensions. A Python slice object is constructed by giving start, stop**,** and step parameters to the built-in slice function. This slice object is passed to the array to extract a part of array.

NumPy – Advanced Indexing

It is possible to make a selection from ndarray that is a non-tuple sequence, ndarray object of integer or Boolean data type, or a tuple with at least one item being a sequence object. Advanced indexing always returns a copy of the data. As against this, the slicing only presents a view.

There are two types of advanced indexing

- Integer
- Boolean**.**

Integer Indexing

This mechanism helps in selecting any arbitrary item in an array based on its N-dimensional index. Each integer array represents the number of indexes into that dimension. When the index consists of as many integer arrays as the dimensions of the target ndarray, it becomes straightforward.

Boolean Array Indexing

This type of advanced indexing is used when the resultant object is meant to be the result of Boolean operations, such as comparison operators.

OS

The OS module in Python provides function for creating and removing a directory (folder), fetching its contents, changing and identifying the current directory, etc. First need to import the os module to interact with the underlying operating system. So, import it using this import os statement before using its functions. It is possible to automatically perform many operating system tasks.

Python OS module provides the facility to establish the interaction between the user and the operating system. It offers many useful OS functions that are used to perform OS-based tasks and get related information about operating system.

The OS comes under Python's standard utility modules. This module offers a portable way of using operating system dependent functionality. The Python OS module lets us work with the files and directories.

Handling the Current Working Directory

Consider Current Working Directory (CWD) as a folder, where the Python is operating. Whenever the files are called only by their name, Python assumes that it starts in the CWD which means that name-only reference will be successful only if the file is in the Python's CWD.

Note: The folder where the Python script is running is known as the Current Directory. This is not the path where the Python script is located.

Getting the Current working directory

To get the location of the current working directory os.getcwd() is used.

Changing the current working directory

To change the current working directory (CWD) os.chdir() method is used. This method changes the CWD to a specified path. It only takes a single argument as a new directory path.

Note: The current working directory is the folder in which the Python script is operating.

Pygame.mixer

This module contains classes for loading sound objects and controlling playback. The mixer module is optional and depends on SDL_mixer. The mixer module has a limited number of channels for playback of sounds. Usually, programs tell pygame to start playing audio and it selects an available channel automatically. All sound playback is mixed in background threads. When you begin to play a Sound object, it will return immediately while the sound continues to play. A single sound object can also be actively played back multiple times.

The mixer also has a special streaming channel. This is for music playback and is accessed through the pygame.mixer.musicpygame module for controlling streamed audio module. Consider using this module for playing long running music. Unlike mixer module, the music module streams the music from the files without loading music at once into memory.

The mixer module must be initialized like other pygame modules, but it has some extra conditions. The pygame.mixer.init() function takes several optional arguments to control the playback rate and sample size. Pygame will default to reasonable values, but pygame cannot perform Sound resampling, so the mixer should be initialized to match the values of your audio resources.

Using the Mixer

First thing to know is that there is a difference between Music and Sound in the Pygame Mixer. Make sure to not confuse the two. Sound is mostly related to small side effects such as crash noises or beeps, generally anything just a few seconds long.

Music, on the other hand refers to longer tracks of audio, like background music or songs which can be up-to an hour long. It's important to know this difference since there are separate libraries for Music and Sound.

Keras

Keras is a deep learning API written in Python, running on top of the machine learning platform TensorFlow. It was developed with a focus on enabling fast experimentation. Being able to go from idea to result as fast as possible is key to doing good research. Keras is simple but not simplistic. Keras reduces developer cognitive load to free you to focus on the parts of the problem that really matter. Keras is flexible that adopts the principle of progressive disclosure of complexity. Keras provides industry strength performance and scalability. It is used by organizations and companies including NASA, YouTube.

The core data structures of Keras are layers and models. The simplest type of model is the Sequential model, a linear stack of layers. For more complex architectures, you should use the Keras functional API, which allows to build arbitrary graphs of layers, or write models entirely from scratch via subclassing.

Keras is a framework for building deep neural networks with Python. Keras enables us to build state-of-the-art, deep learning systems just like those used at Google and Facebook, with little complexity and also with a few lines of code. Some of its key features are:

- User-friendly API
- Built-In support for convolutional networks (for computer vision), recurrent networks (for sequence processing), and any combination of both.
- Supports arbitrary network architectures: multi-input or multi-output models, layer sharing, model sharing, and so on.

Keras is a front-end layer written in Python that runs on top of other popular deep learning toolkits like TensorFlow, Theano and Microsoft Cognitive Toolkit (CNTK). Any piece of code that you write with Keras can be run with any of these backends without having to change anything in the code. Via TensorFlow/Theano /CNTK, Keras can run seamlessly on both CPUs and GPUs.

Installation

Before installing Keras, we need to install one of its backend engines, i.e., either of the three: TensorFlow, Theano, or CNTK. In this article, we shall be working with the TensorFlow backend. Read the detailed instructions here to install Tensorflow.

There are two ways to install Keras:

- Install Keras from PyPI (recommended):

```
sudo pip install keras
```

If you are using a virtualenv, you may want to avoid using sudo:

```
pip install keras
```

- Alternatively: Install Keras from the GitHub source:

First, clone Keras using `git`:

```
git clone https://github.com/keras-team/keras.git
```

Then, `cd` to the Keras folder and run the install command:

```
cd keras
sudo python setup.py install
```

3. PROJECT DESCRIPTION

Nowadays some students will write exams online via remote proctoring platforms that surveillance their activities. Proctoring tools can monitor eye movements, capture student's keystrokes, record their screens and track their searches as well as their home environments and physical behaviours. This is very similar to eye detection. Students facial key points are again used for this task and the test-taker is required to sit straight (as he would in the test) and the distance between the lips key points (5 outer pairs and 3 inner pairs) is noted for 100 frames and averaged. If the user turns his/her head the distances between the points increases and if the increase in distance is more than a certain value for at least three outer pairs and two inner pairs then infringement is reported. If the count is not equal to an alarm can be raised.

4. MODULE DESCRIPTION

MODULES

- Input Camera Videos
- Face Detection Method
- Eye Tracking Method
- Malpractice Detection

Input camera videos

After the student is logged in, the student face is detected and the frame is set as per the student facePositions. First, we defined the hardware on which the video analysis will be done. From this, we captured the video in real-time, frame by frame

Face detection method

we processed each frame and extracted the locations of all the faces in the image. Finally, we rendered these frames in video form, along with the face locations

Eye tracking method

Eye localization. Thresholding to find the whites of the eyes. Determining if the “white” region of the eyes disappears for a period of time (indicating a blink). The eye aspect ratio is instead a much more elegant solution that involves a very simple calculation based on the ratio of distances between facial landmarks of the eyes. This method for eye blink detection is fast, efficient, and easy to implement.

Malpractice detection

Students facial key points are again used for this task and the test-taker is required to sit straight (as he would in the test) and the distance between the lips key points is noted for averaged. If the user turns his/her head the distances between the points increases and if the increase in distance is more than a certain value for at least three outer pairs and two inner pairs then infringement is reported. If the count is not equal to an alarm can be raised.

5. SYSTEM STUDY

Feasibility Study

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system isto be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are

- Economical Feasibility
- Technical Feasibility
- Social Feasibility

Economical Feasibility

This study is carried out to check the economic impact that the systemwill have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

Technical Feasibility

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

Social Feasibility

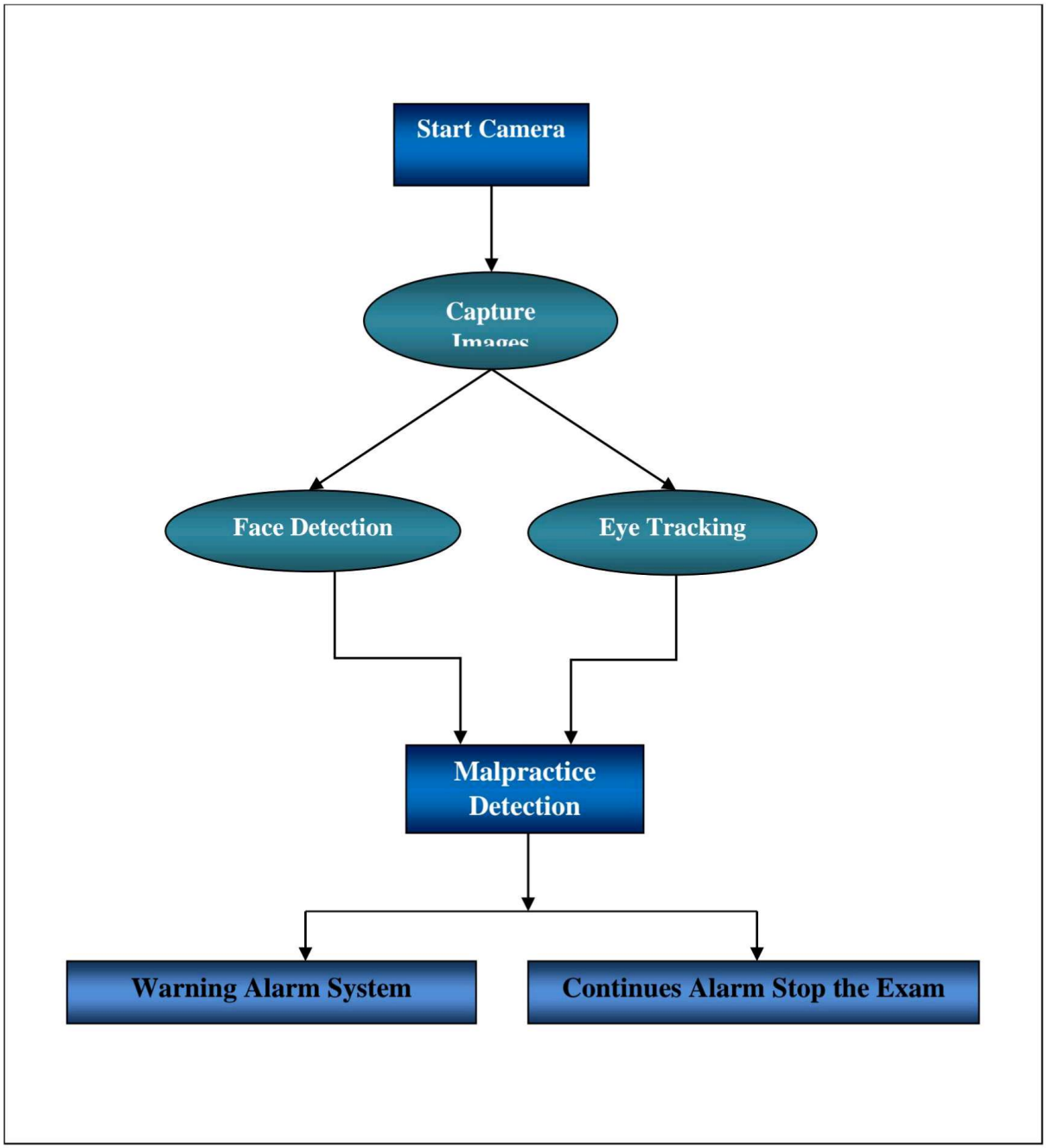
The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

6. SYSTEM ANALYSIS

System analysis is a process of gathering and interpreting facts, diagnosing problems and the information about the online exam surveillance to recommend improvements on the system. It is a problem solving activity that requires intensive communication between the system users and system developers. System analysis or study is an important phase of any system development process. The system is studied to the minutest detail and analyzed. The system analyst plays the role of the interrogator and dwells deep into the working of the present system. The system is viewed as a whole and the input to the system are identified. The outputs from the organizations are traced to the various processes. System analysis is concerned with becoming aware of the problem, identifying the relevant and decisional variables, analyzing and synthesizing the various factors and determining an optimal or at least a satisfactory solution or program of action. A detailed study of the process must be made by various techniques like interviews, questionnaires etc. The data collected by these sources must be scrutinized to arrive to a conclusion. The conclusion is an understanding of how the system functions. The system is called the existing system. Now the existing system is subjected to close study and problem areas are identified. The designer now functions as a problem solver and tries to sort out the difficulties that the enterprise faces. The solutions are given as proposals. The proposal is then weighed with the existing system analytically and the best one is selected. The proposal is presented to the user for an endorsement by the user. The proposal is reviewed on user request and suitable changes are made. This is loop that ends as soon as the user is satisfied with proposal. Preliminary study is the process of gathering and interpreting facts, using the information for further studies on the system. Preliminary study is problem solving activity that requires intensive communication between the system users and system developers. It does various feasibility studies. In these studies a rough figure of the system activities can be obtained, from which the decision about the strategies to be followed for effective system and analysis can be taken.

7. SYSTEM DESIGN

Architectural Design:



8. SYSTEM TESTING

The steps involved during System testing are as follows:

- Integration of all the modules/forms in the system
- Preparation of the test cases
- Preparation of the possible test data with all the validation checks
- Actual testing done manually
- Recording of all the reproduced errors
- Modifications done for the errors found during testing
- Prepared the test result scripts after rectification of the errors.

The system Testing done included the testing of the following items:

1. Functionality of the entire system as a whole
2. User interface of the system
3. Testing the dependent modules together with all the possible test data scripts.
4. Verification and Validation testing
5. Testing the reports with all its functionality

After the completion of system testing, the next following phase was the Acceptance Testing Clients at their end did this and accepted the system with appreciation. Thus, we reached the final phase of the project delivery.

There are other six tests, which fall under special category. They are described below:

- **Peak Load Test:** it determines whether the system will handle the volume of activities that occur when the system is at the peak of its processing demand. For example, test the system by activating all terminals at the same time
- **Storage Testing:** It determines the capacity of the system to store transaction data on a disk or in other files
- **Performance Time Testing:** It determines the length of time system used by the system to process transaction data. This test is conducted prior to implementation to determine how long it takes to get a response to an inquiry, make a backup copy of a file, or send a transmission and get a response.

- **Recovery Testing:** This testing determines the ability of user to recover data or re-start system after failure. For example, load backup copy of data and resume processing without data or integrity loss.
- **Procedure Testing:** It determines the clarity of documentation on operation and uses of system by having users do exactly what manual request. For example, powering down system at the end of week or responding to paper-out light on printer.
- **Human Factors Testing:** It determines how users will use the system when processing data or preparing reports.

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product it is the process of exercising software withthe intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

Unit testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results. Unit testing is usually conducted as part of a combined code and unit test phase of the softwarelifecycle, although it is not uncommon for coding and unit testing to be conducted as two distinct phases.

Test strategy and approach

Field testing will be performed manually and functional tests will be written in detail.

Test objectives

- All field entries must work properly.
- Pages must be activated from the identified link.
- The entry screen, messages and responses must not be delayed.

Features to be tested

- Verify that the entries are of the correct format.
- No duplicate entries should be allowed.
- All links should take the user to the correct page.

Integration testing

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components. Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects.

The task of the integration test is to check that components or software applications, e.g. components in a software system or one step up software applications at the company level interact without error.

Test Results

All the test cases mentioned above passed successfully. No defects encountered.

Acceptance Testing

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

Test Results

All the test cases mentioned above passed successfully. No defects encountered.

Functional test

Functional tests provide systematic demonstrations that functions testedare available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is cantered on the following items:

- Valid Input : Identified classes of valid inputmust be accepted.
- Invalid Input : Identified classes of invalid inputmust be rejected.
- Functions : Identified functions must be exercised.
- Output : Identified classes of applicationoutputs must be exercised.
- Systems/Procedures : Interfacing systems or proceduresmust be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing.

System Test

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

White Box Texting

White Box Testing is a testing in which in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It is purpose. It is used to test areas that cannot be reachedfrom a black box level.

Black Box Testing

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a testing in which the software under test is treated, as a black box .you cannot "see" into it. The test provides inputs and responds to outputs without considering how the software works.

9. CODING

Drowsiness detection.py

```
import cv2
import os
from keras.models import load_model
import numpy as np
from pygame import mixer
import time



mixer.init()
sound = mixer.Sound('alarm.wav')

face = cv2.CascadeClassifier('haar cascade files\haarcascade_frontalface_alt.xml')
leye = cv2.CascadeClassifier('haar cascade files\haarcascade_lefteye_2splits.xml')
reye = cv2.CascadeClassifier('haar cascade files\haarcascade_righteye_2splits.xml')



lbl=['Writing','Warning']

model = load_model('models/fair.h5')
path = os.getcwd()
cap = cv2.VideoCapture(0)
font = cv2.FONT_HERSHEY_COMPLEX_SMALL
count=0
score=0
thicc=2
rpred=[99]
lpred=[99]
```

```
while(True):
ret, frame = cap.read()
capture=frame

height,width = frame.shape[:2]

gray = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)

faces = face.detectMultiScale(gray,minNeighbors=5,scaleFactor=1.1,minSize=(25,25))
left_eye = leye.detectMultiScale(gray)
right_eye =  reye.detectMultiScale(gray)

cv2.rectangle(frame, (0,height-50) , (200,height) , (0,0,0) , thickness=cv2.FILLED )

for (x,y,w,h) in faces:
cv2.rectangle(frame, (x,y) , (x+w,y+h) , (100,100,100) , 1 )

for (x,y,w,h) in right_eye:
r_eye=frame[y:y+h,x:x+w]
count=count+1
r_eye = cv2.cvtColor(r_eye,cv2.COLOR_BGR2GRAY)
r_eye = cv2.resize(r_eye,(24,24))
r_eye= r_eye/255
r_eye=  r_eye.reshape(24,24,-1)
r_eye = np.expand_dims(r_eye,axis=0)
rpred1 = model.predict(r_eye)
rpred2=list(rpred1[0])
rpred3=max(rpred2)
rpred=rpred2.index(rpred3)
if(rpred==1):
lbl='Write'
if(rpred==0):
lbl='Alert'
break
```

```
for (x,y,w,h) in left_eye:
l_eye=frame[y:y+h,x:x+w]
count=count+1
l_eye = cv2.cvtColor(l_eye,cv2.COLOR_BGR2GRAY)
l_eye = cv2.resize(l_eye,(24,24))
l_eye= l_eye/255

l_eye=l_eye.reshape(24,24,-1)
l_eye = np.expand_dims(l_eye,axis=0)
lpred1 = model.predict(l_eye)
lpred2=list(lpred1[0])
lpred3=max(lpred2)
lpred=lpred2.index(lpred3)
if(lpred==1):
lbl='Writing'
if(lpred==0):
lbl='Warning'
break

if(rpred==0 and lpred==0):
score=score+1
cv2.putText(frame,"Warning",(10,height-20), font, 1,(255,255,255),1,cv2.LINE_AA)
# if(rpred[0]==1 or lpred[0]==1):
else:
score=0
#score=score-1
cv2.putText(frame,"Writing",(10,height-20), font, 1,(255,255,255),1,cv2.LINE_AA)

if(score<0):
score=0
cv2.putText(frame,'Score:'+str(score),(100,height-20),font, 1,(255,255,255),1,cv2.LINE_AA)
if(score>5):
count+=1
filename="captue"+str(count)+".jpeg"
```

```
file='capture'+"/"+filename
cv2.imwrite(file, capture)

#person is feeling sleepy so we beep the alarm
cv2.imwrite(os.path.join(path,'image.jpg'),frame)
try:
sound.play()

except:  # isplaying = False
pass

if(thicc<5):
thicc= thicc+2
else:
thicc=thicc-2
if(thicc<2):
thicc=2
cv2.rectangle(frame,(0,0),(width,height),(0,0,255),thicc)
cv2.imshow('Exam_Investigation',frame)
if cv2.waitKey(1) & 0xFF == ord('q'):
break
cap.release()
cv2.destroyAllWindows()
```

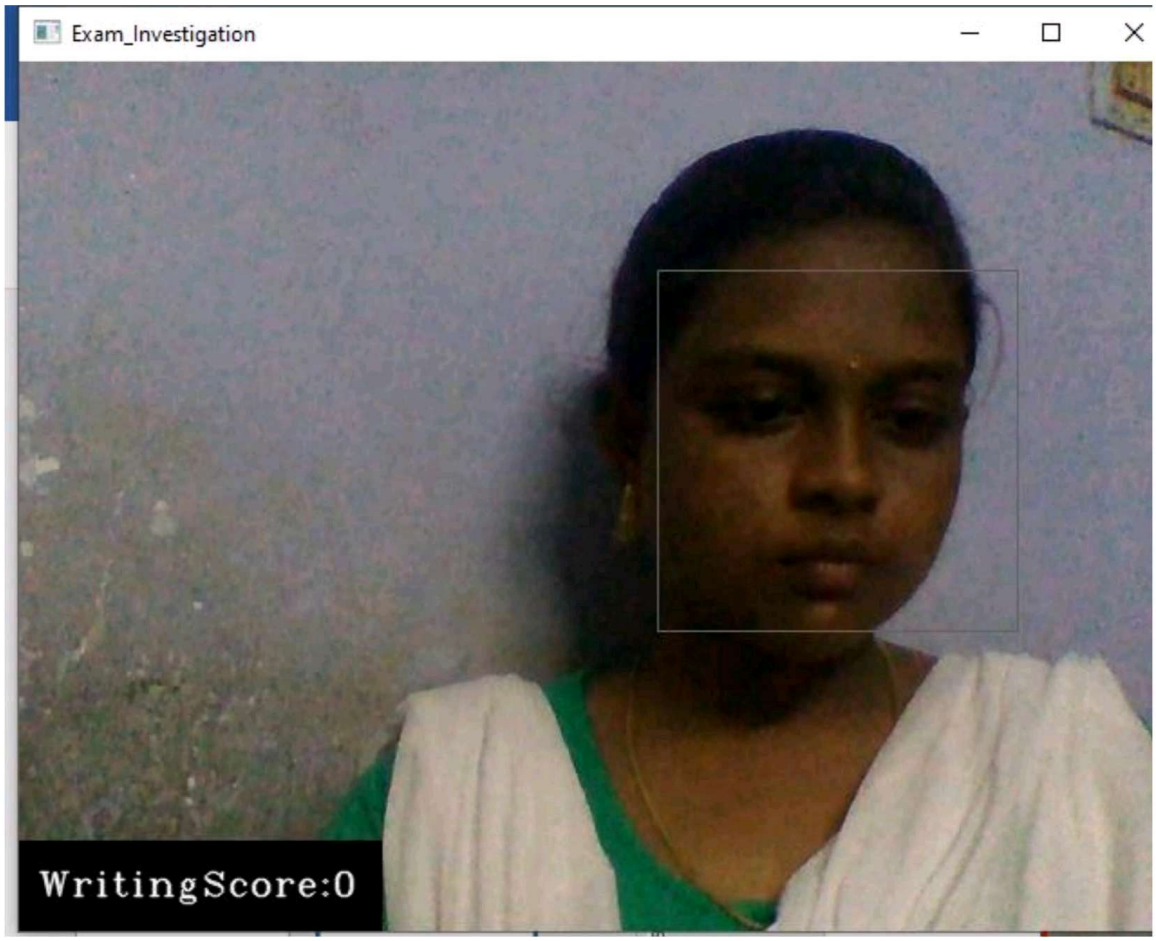
Model.py

```
import os
from keras.preprocessing import image
import matplotlib.pyplot as plt
import numpy as np
from keras.utils.np_utils import to_categorical
import random,shutil
from keras.models import Sequential
from keras.layers import Dropout,Conv2D,Flatten,Dense, MaxPooling2D, BatchNormalization
from keras.models import load_model


def generator(dir, gen=image.ImageDataGenerator(rescale=1./255), shuffle=True,batch_size=1,target_size=(24,24),class_mode='categorical' ):

    return gen.flow_from_directory(dir,batch_size=batch_size,shuffle=shuffle,color_mode='grayscale',class_mode=class_mode,target_size=target_size)

BS= 32
TS=(24,24)
train_batch= generator('data/train',shuffle=True, batch_size=BS,target_size=TS)
valid_batch= generator('data/valid',shuffle=True, batch_size=BS,target_size=TS)
SPE= len(train_batch.classes)//BS
VS = len(valid_batch.classes)//BS
print(SPE,VS)


# img,labels= next(train_batch)
# print(img.shape)

model = Sequential([
    Conv2D(32, kernel_size=(3, 3), activation='relu', input_shape=(24,24,1)),
```

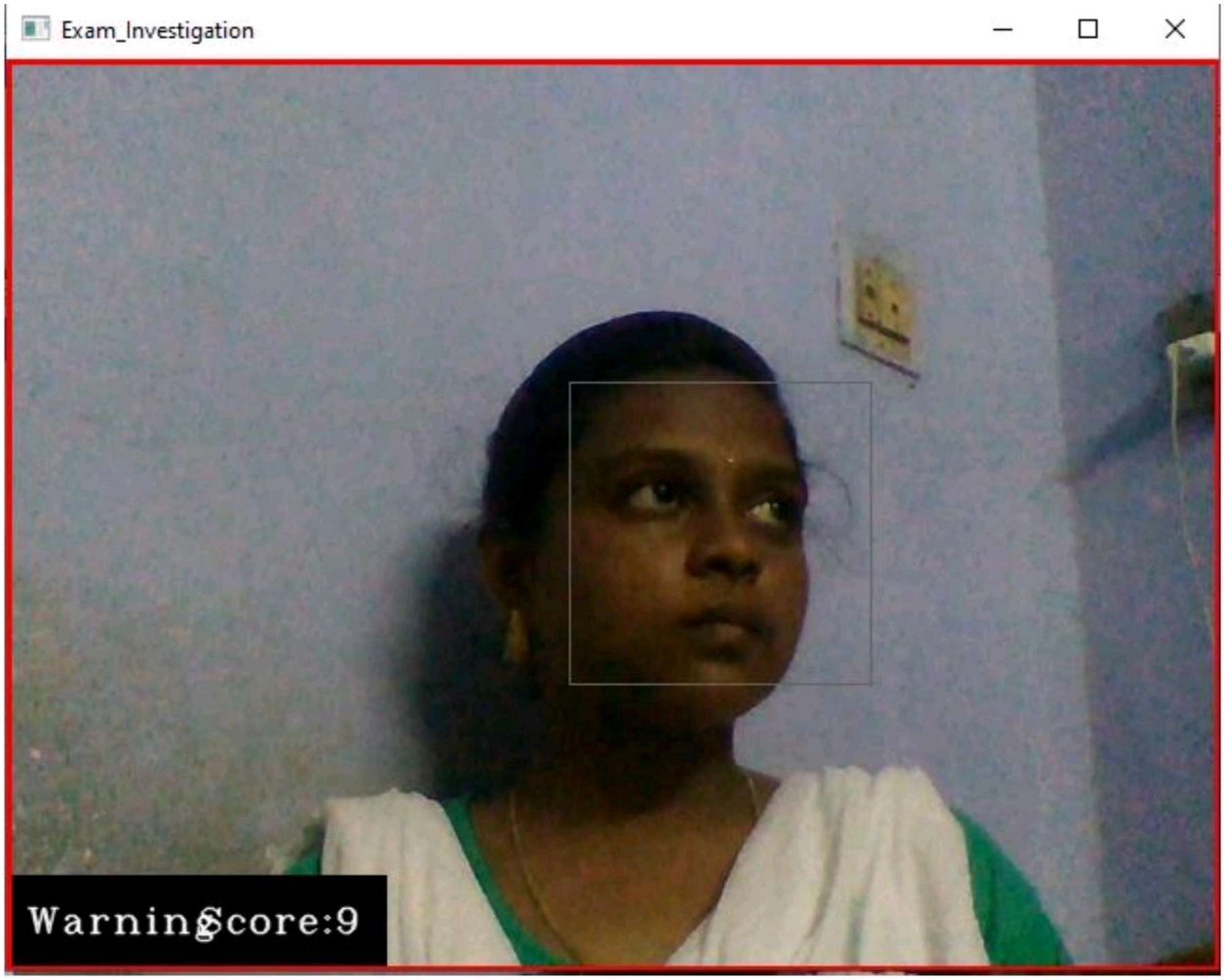
```
    MaxPooling2D(pool_size=(1,1)),
    Conv2D(32,(3,3),activation='relu'),
    MaxPooling2D(pool_size=(1,1)),
#32 convolution filters used each of size 3x3
#again
    Conv2D(64, (3, 3), activation='relu'),
    MaxPooling2D(pool_size=(1,1)),

#64 convolution filters used each of size 3x3
#choose the best features via pooling

#randomly turn neurons on and off to improve convergence
    Dropout(0.25),
#flatten since too many dimensions, we only want a classification output
    Flatten(),
#fully connected to get all relevant data
    Dense(128, activation='relu'),
#one more dropout for convergence' sake :)
    Dropout(0.5),
#output a softmax to squash the matrix into output probabilities
    Dense(2, activation='softmax')
])

model.compile(optimizer='adam',loss='categorical_crossentropy',metrics=['accuracy'])

model.fit_generator(train_batch,
validation_data=valid_batch,epochs=15,steps_per_epoch=SPE ,validation_steps=VS)

model.save('models/Cat2.h5', overwrite=True)
```

10. SCREENSHOTS

Before alarm raising:



After alarm raising:



11. CONCLUSION

To avoid and monitor such malpractices the automatic alarm system using image processing is proposed in this work. First the input frame is extracted from video and face will be recognized. Political economy theory, we analyse the discourse surrounding marketing models of the World Wide Web, specifically Internet ad servers and infomediaries, in an effort to understand the social implications of online corporate surveillance. Drawing upon the work of Foucault, we consider the usefulness of the metaphorical Panoptic on in conceptually apprehending online surveillance and power relations in cyberspace.

12. FUTURE ENHANCEMENT

In future, we can develop a system to analyze the malpractices very well by using student's activity and their biometric authentication from the online exam surveillance. We can intimate their staffs by sending messages and by providing alarm system after identifying the fraud students. This will improve the online surveillance and power relations in cyberspace.

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COLLEGE SELECTION APP

A project Submitted to

ST. MARY'S COLLEGE (AUTONOMOUS), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

in partial fullfilment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted By

PIRAMANAYAKI. J

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Under the Supervision and Guidance of

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MAY 2022

CERTIFICATE

This is to certify that this project work entitled as "**COLLEGE SELLECTION APP**" is submitted to St. Mary's College (Autonomous), Thooothukudi affiliated to **Manonmaniam Sundaranar University**, **Tirunelveli,** in partial fulfillment for the award of the degree of Master of Science in Computer Science for the work done during the year 2021-2022 by **PIRAMANAYAKI. J (Reg.No.: 20SPCS14).**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do hereby declare that the project entitled "**COLLEGE SELECTION APP**" submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC), St. Mary's College (Autonomous), Thoothukudi.

Station: Thoothukudi **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA.,M.Phil.,Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani, Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and Coordinator, PG Department of Computer Science (SSC) for her support and counsel.

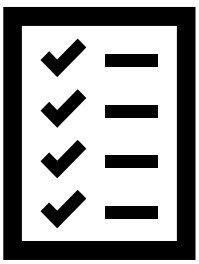
I express my hearty thanks to my guide, Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC) for her valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to Ms. A. Jenitta Jebamalar M.Sc.(IT), M.Sc.(CS), M.Phil., B.Ed., Assistant Professor, PG Department of Computer Science (SSC) for her encouragement and support.

I am much indebted to Mr. N. Arunachalam M.Sc.(CS), Proprietor, Acme Infotek for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

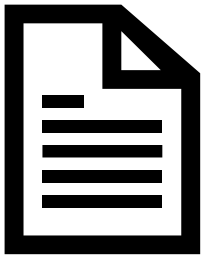
ABSTRACT



ABSTRACT

In today's world selecting the best place for studies is very tedious. The students or parents have to analyse each and every colleges. College Management System is a internet based Web Portal that aims at providing information to all levels of management system for the College. This system can be used as a information management system for the college. The Online College Selection System will enables students to gain information regarding college location, alumni, Departments, etc. The system has two users named college admin and students. The college admin have to register their college details and add information such as location of the institution and add department information regard every institution and other information. The information will be displayed to students module, on search for the college name or city name. The college admin have to upload the images of institution campus, hostel, sports, gym, and other modules. The placement module enables the students to verify the companies visited and number of placement obtained from the department for each year. Also, using the Student Application, students can apply for the college through their findings and the applied list will be reflected in the College Admin App. The system developed for online using PHP, Bootstrap as front end, and MySQL as back end.

INTRODUCTION



1. INTRODUCTION

Students who are entering into graduation are showing interest in joining the courses like engineering, science and technology courses etc. which are currently most serious issues confirmed by national science foundation. Career selection is one of the most important activities in every individual's life. For selecting a career the faculty members of an institution must give advices to the student in which branch he/she should choose. These effective advising consists of providing current information and technologies. The selection of academic branch will lead to an acceptable career for students who are entering into graduation. Higher education is a powerful tool for the students to build a knowledge based society of present century. Computer system which is called an expert system, assesses the academic major of a student has gained great influence than the manual counselling which is given by the advisors in an institution or universities.

The students do not know their real capacity and abilities for choosing the career options. The students who are entering into higher education do not know the capabilities of the faculty. So a decision support system is an expert system which is helpful to choose their interested branches and according to these interests a career is selected. In universities or any educational institutions faculty in those institutions do counselling to the students and help them to complete the registration process. A perfect planning should be done from both students and teachers. Academic advisors discover many problems, opportunities, improvements and discover new courses as technology increases and which may be useful for the students to cope up in the industry.

Many of the universities or institutions in the world are using automated counselling systems which are also called as web based counselling systems. These web counselling systems are more useful and helpful for the students and faculty in which they assist the students to take better selection of the branches which lead to interesting career opportunities.

The system allows the faculty to enter the student information and also it allows faculty to enter the grades of students for assignments and exams. This system provides details of the courses which a student registered and the backlogs information is also displayed for the student future reference. This decision making system also have some questions which are asked in various areas and measure the capacity of the student in these fields and the intelligence level is measured.

Most of the institutions develop this decision making systems in rule based model. Some rules have been used in designing this expert system known as CLIPS rules. The total number of students who are entering into different academic degrees are increasing year by year. Here is the table which represents total number of students entering into different degrees. As mentioned in the table 1.0, these

are the reports of students who are entering into different courses every year. These students may choose their degree based on his/her interest or based on the interest of their parents. If student does not choose his branch according to his/her interest, then his career is effected and he can't do job with interest. Some develop computerized systems using artificial intelligence techniques for problem solving abilities in a more efficient way. The methods which are used in problem solving are logical programming, fuzzy logic, neural networks, hybrid intelligent systems etc.

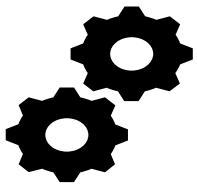
The methods which are used to solve the problem are mainly dependent on the type of the problem and whether the database has explicit data on the current problem. Here we are using some techniques to counsel a student for his/her academic branches which makes him to give best in his academics and get careers best job.

ACADEMIC ADVISING

In the present days student detention is one of the important factor for a counselor to advise the student not to do that mistake and choose their interested branch [4]. Some people play an important role in advising students about their career, those persons are called as mentors/advisors/counsellors. Many universities/institutions are using newly developed technologies for academic counselling so that faculty can involve more time in planning about student's career development rather than wasting so much of time on paper based advising system. Successful advising involves knowledge base of the students who are requiring advice. In addition to this counsellor should have sufficient knowledge about the academic courses and curriculum requirements within a university/institution.

A person who has complete knowledge on all these activities will give correct and accurate guidance to the students who are entering into higher education. So far students are the key persons to select their career choices but now the percentage of the job seekers and the persons who are willing to do jobs in their particular branch are decreasing. So the concept of academic advising came forward. Students are willing to do job for every lower salaries and this may affect their future life. In previous academic advising is done by faculty members of an institution. Some questionnaires are given to students and they have to fill those forms and submit it to the faculty, then that faculty advises branches for which the students suits for.

SYSTEM SPECIFICATION



2. SYSTEM SPECIFICATION

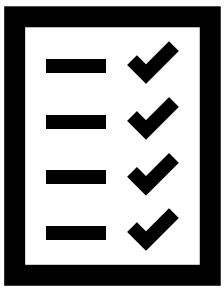
HARDWARE SPECTIFICATION

COMPONENT	SPECIFICATION
CPU	Intel Dual Core 2.4 GHz or Later
RAM	2GB DDR2
Hard Disk	160 GB
Display	Wide VGA (Video Graphics Array)
Input	Keyboard and Mouse

SOFTWARE SPECIFICATION

COMPONENT	SPECIFICATION
Front End	PHP, Android
Back End	MySQL
IDE	Notepad++
Platform	Windows 7 or later
Database Server	XAMPP

PROJECT DESCRIPTION



3. PROJECT DESCRIPTION

SCOPE OF THE PROJECT

The main scope of the project is to provide an interface for students and college admin about college data input and students search portal.

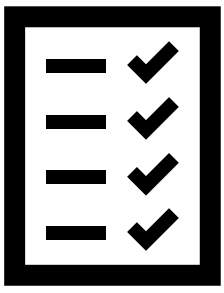
AIM OF THE PROJECT

The main aim of the project is to retrieve the best college information to students searching based on the city, department and gender wise.

OBJECTIVE OF THE PROJECT

- Enables students to access all important aspects of selecting college.
- Easy search will list all related colleges in the user location and gender criteria.
- Fee details allows student to compare it other college or institution.
- Information will be provided with college data and pictures

MODULE DESCRIPTION



4. MODULE DESCRIPITION

MODULES

The college selection app consists of the following modules

- College Admin
- Students
- Location
- Departments
- Fees
- Hostel
- Transportation
- Events
- Sports
- Campus
- Search

COLLEGE ADMIN MODULE

- In this module, the main administrator of the college can register the account in this web portal with their college name, unique login id and password for authentication
- The Login ID and Password later can used to update the college and department information in the portal.

STUDENTS MODULE

- In this module, the students can register their profile along with contact information.
- An unique ID and password required by this web portal can used for authentication the student.
- Using this authentication, students can access their separate dashboard to search the college information.

LOCATION MODULE

- In this module, the admin of the college can add the college location along with contact number, email id, and register website URL.
- An admin can enter more than one college information to their dashboard. This information will be recorded separately using unique location id.

DEPARTMENT MODULE

- In this module, the college admin can add departments to each location added in the earlier module.
- The department information contains department type, department name and years.
- This information will be later available to students search module.

FEE MODULE

- In this module, the admin can update fee details for departments in each location.
- The fee details will be update in the database along with department id.

HOSTEL MODULE

- In this module, the hostel information along with room type and fee will be updated.
- This information also includes fee for Air Conditioner, Wifi etc. The students calculate their hostel fee according to their needs.

TRANSPORTATION MODULE

- In this module, the college administrator can add the transportation fee for each locations.
- This information will be later available to the students in the college page.

EVENTS MODULE

- In this module, the admin can add the latest events happened in the college.
- This information contains the photos and dates about the event.

SPORTS MODULE

- In this module, the college sports events can be entered by the college administrator.
- This information also contains photos and date about the sports events.

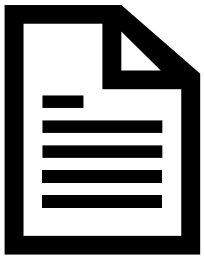
CAMPUS EVENT

- In this module, the college admin can add the placement information in previous years.
- This information contains company name, number students placed, location of the company and department about placement.

SEARCH MODULE

- In this module, the student can search the college record with a keyword. The keyword contains a part or full name of the college or city etc.
- The results will be displayed using this keyword.
- Also the gender wise search will help the students in selecting college. For example a male students retrieve record about male colleges and co-ed colleges. Whereas female students retrieve records about female colleges and co-ed colleges.

DATABASE DESCRPITION



5. DATABASE DESCRPITION

tabusers

Used to store authentication information regarding college administrator.

SERIAL	COLUMN NAME	DATA TYPE	CONSTRAINTS
1	Collegename	VARCHAR(50)	NOT NULL
2	Username	VARCHAR(50)	PRIMARY KEY
3	Password	VARCHAR(50)	NOT NULL

tablocation

Used to store locations of the college.

SERIAL	COLUMN NAME	DATA TYPE	CONSTRAINTS
1	Locationid	INT	AUTO INCREMENT
2	Username	VARCHAR(50)	NOT NULL
3	institute_name	VARCHAR(50)	NOT NULL
4	address_line_1	VARCHAR(50)	NOT NULL
5	address_line_2	VARCHAR(50)	NOT NULL
6	address_line_3	VARCHAR(50)	NOT NULL
7	City	VARCHAR(50)	NOT NULL
8	State	VARCHAR(50)	NOT NULL
9	Pin	INT	NOT NULL
10	Landline	VARCHAR(50)	NOT NULL
11	Mobile	VARCHAR(10)	NOT NULL
12	Email	VARCHAR(50)	NOT NULL
13	url	VARCHAR(50)	NOT NULL

tabdepartment

Used to store department information about the college.

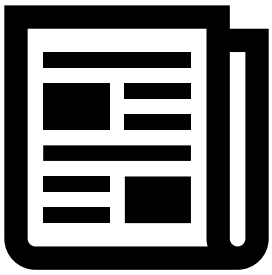
SERIAL	COLUMN NAME	DATA TYPE	CONSTRAINTS
1	Departmentid	INT	AUTO INCREMENT
2	Locationid	INT	NOT NULL
3	Depttype	VARCHAR(50)	NOT NULL
4	Deptname	VARCHAR(50)	NOT NULL
5	Years	INT	NOT NULL

tabfee

Used to store fee information regarding college department.

SERIAL	COLUMN NAME	DATA TYPE	CONSTRAINTS
1	Departmentid	INT	PRIMARY KEY
2	Fee	INT	NOT NULL

SYSTEM STUDY



6. SYSTEM STUDY

EXISTING SYSTEM

In the previous work, there is no defined web portal for college comparison. The students have to verify each websites of the colleges. Also some of the college didn't provides all information about the college. The existing system is, if a student want to get the information about a particular college or institution, he/she have use the search engines like Google or Bing to get the data or some referrals from previous students. This may leads to inaccurate data about the institutions.

DISADVANTAGES OF EXISTING SYSTEM

- No such previous works
- Inaccurate results
- Doesn't provide all information

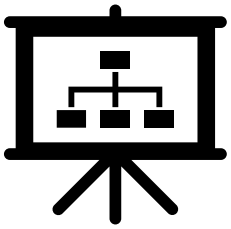
PROPOSED SYSTEM

In the proposed system, a novel portal system has been initialized to verify the college information for students. The students can verify the college and department and other details in simple search. This information is highly accurate and does have full information about the institution. The system might contain maximum information of most colleges in Tamil Nadu.

ADVANTAGES OF PROPOSED SYSTEM

- Accurate results
- Provide information with pictures

SYSTEM ANALYSIS



7. SYSTEM ANALYSIS

FEASIBILITY STUDY

TECHNOLOGY & SYSTEM FEASIBILITY:

Feasibility study of technology and system depends on the interface design of how android application is interactive, best visualized and user-friendly for architectural students and on the system functionalities how the features of architectural application are best and useful and also on hardware availability.

HUMAN-FACTOR/TIME FEASIBILITY:

Feasibility study of human-factor and schedule depends on user background so that user can set their on background and on comfortability, how the user is able to use the application efficiently and produce meaningful and precise output and also on user's demands, project deadlines and readiness that how the application fulfills the flexibility and requirement of the users.

FINANCIAL FEASIBILITY:

Economy feasibility study depends on infrastructure cost, Maintenance cost and overall solution cost of proposed application.

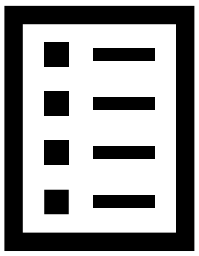
LEGAL FEASIBILITY:

Legal feasibility depends on privacy, security and legal concerns such as data privacy, accountability, nepotism , and many more.

OPERATIONAL/RESOURCE FEASIBILITY:

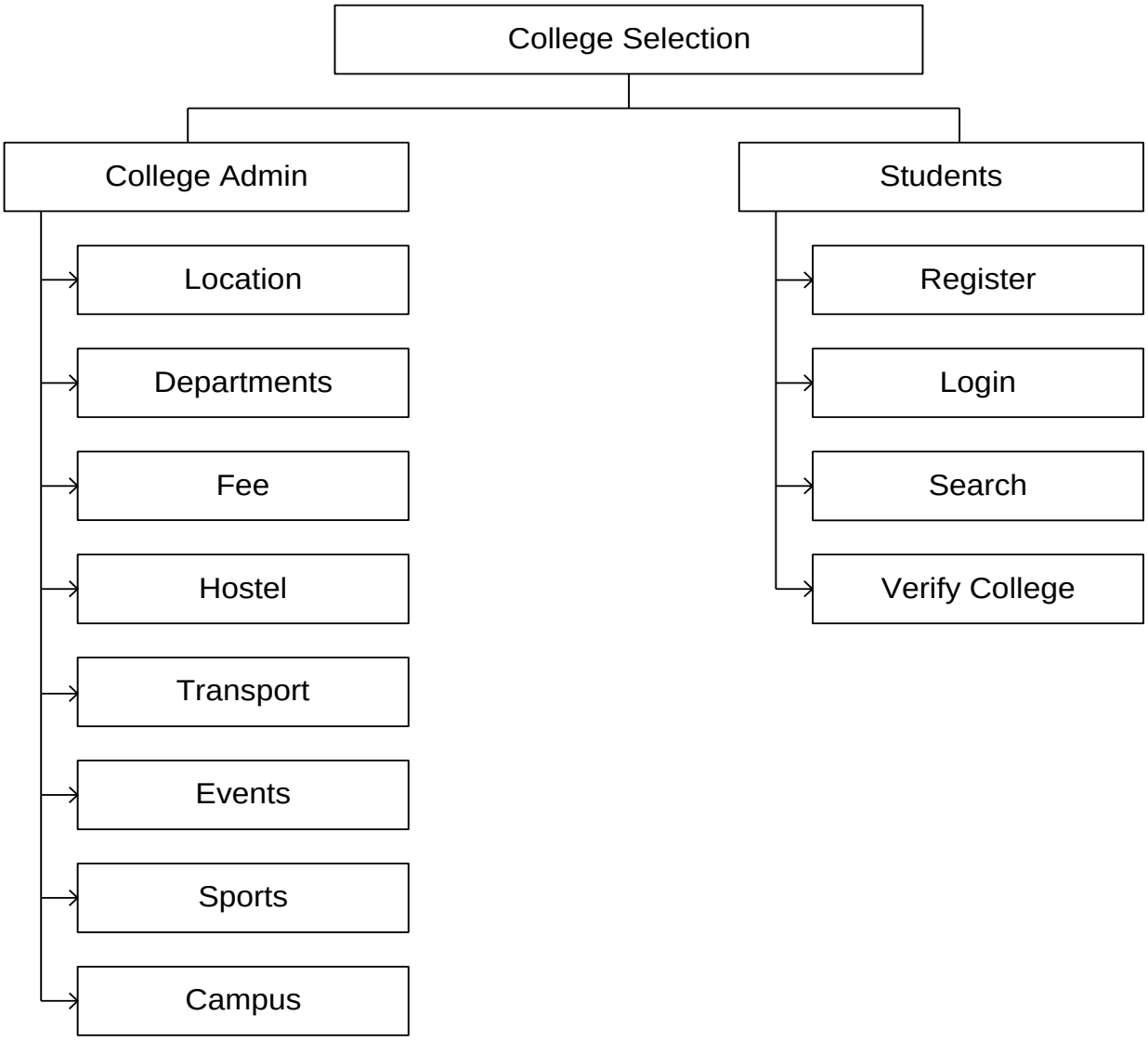
It depends on how application (system) solves the problems and satisfies the requirement of users by using some operational parameter such as affordability, reliability, disposability, maintainability, sustainability, usability, supportability, producibility and resource feasibility depends on time availability and amount of resources.

SYSTEM DESIGN

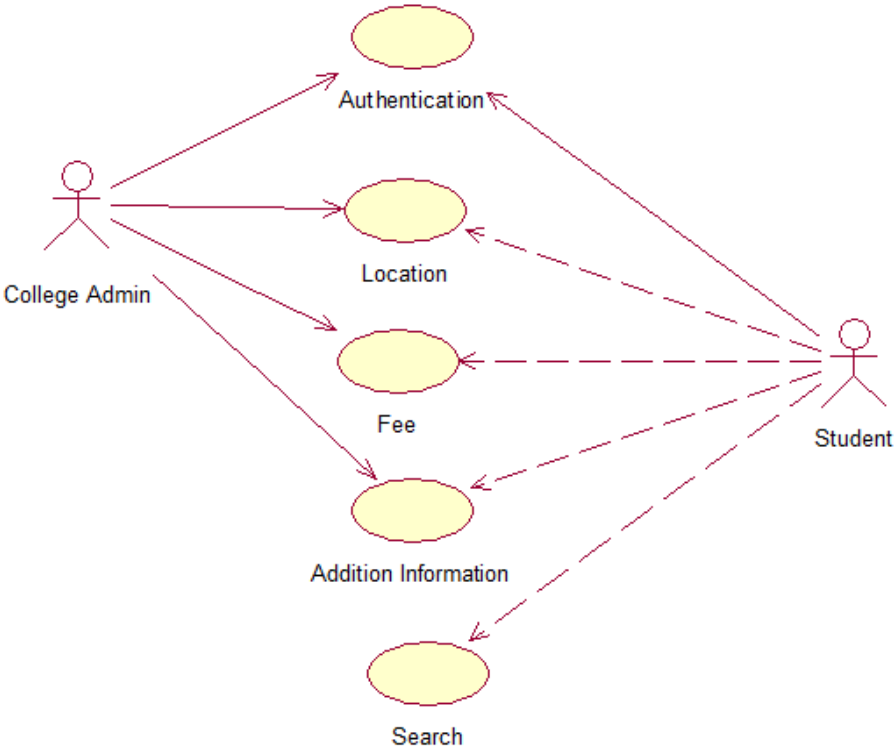


8. SYSTEM DESIGN

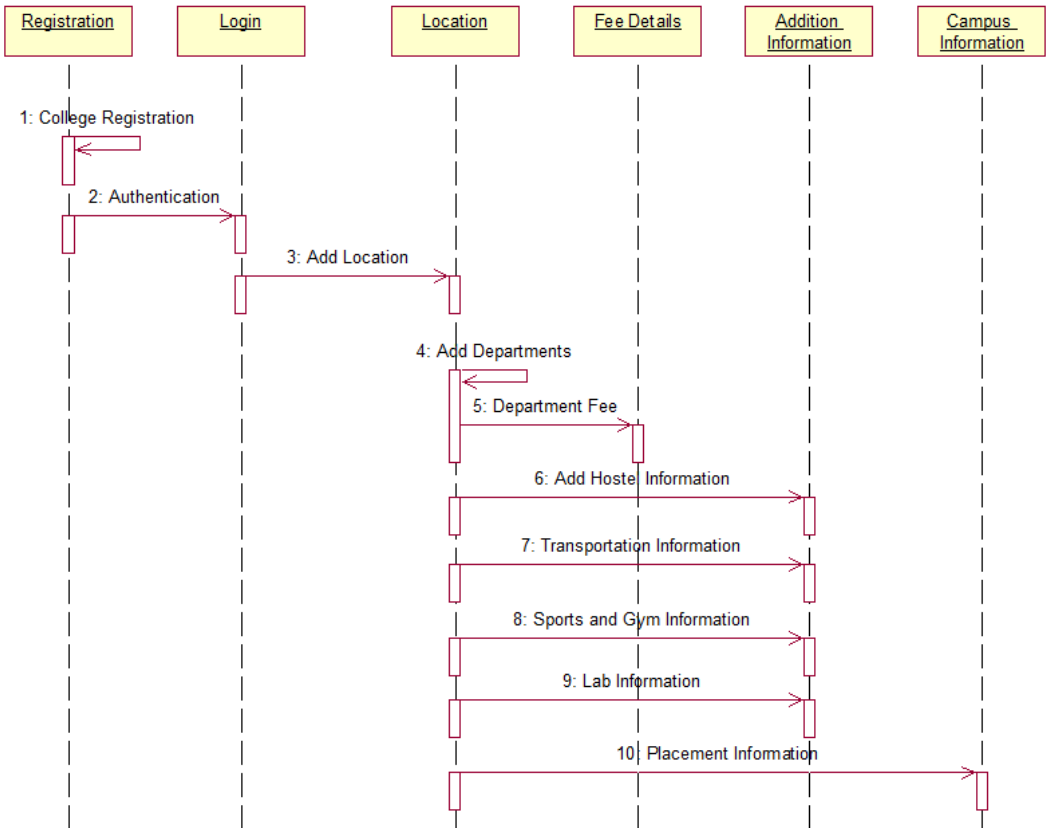
ARCHITECTURE DIAGRAM



USE CASE DIAGRAM

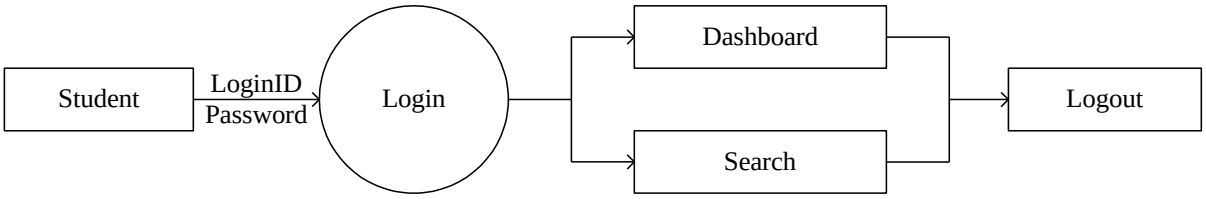


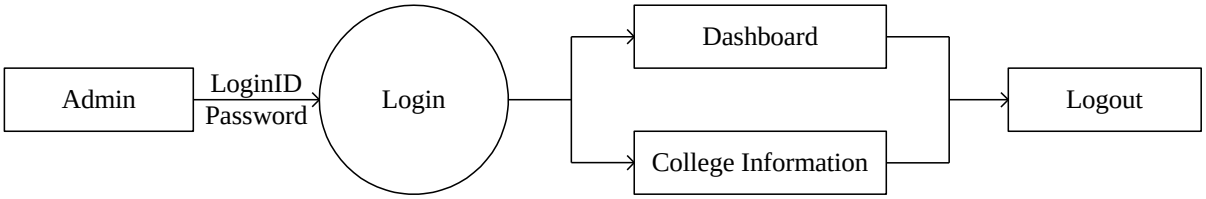
SEQUENCE DIAGRAM



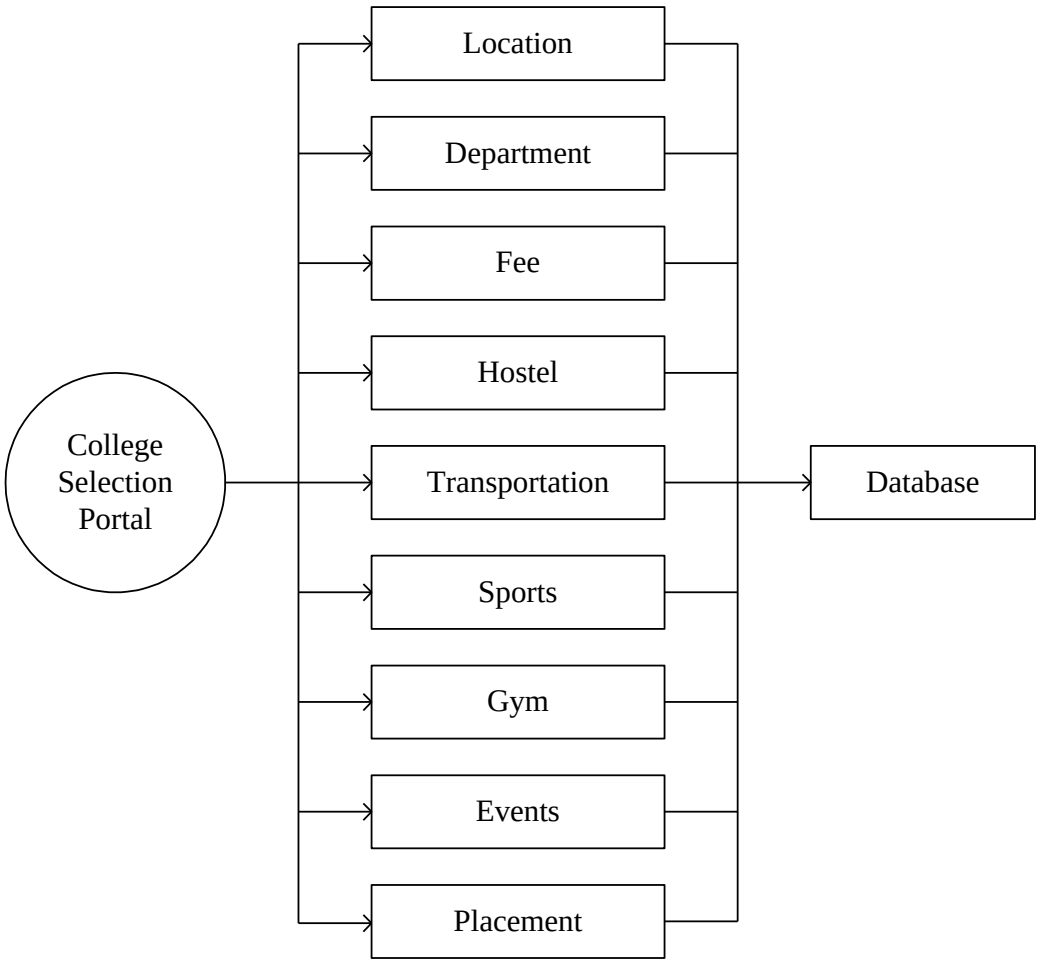
DATA FLOW DIAGRAM (DFD)

LEVEL 0





LEVEL 1



SYSTEM TESTING

9. SYSTEM TESTING

SYSTEM TESTING

Before applying method to design effective test cases, a software engineer must understand the basic principles that guide software testing. Davis (DAV95) suggests a set of testing principles which have been adapted for use in this book.

- All tests should be traceable to customer requirements.
- Test should be planned long before testing begins.
- Test pare to principle applets to software testing.
- Testing should begin “in the small” and progress towards testing “in the page”
- Exhaustive testing is not possible.

UNIT TESTING

Unit testing focuses on verification errors on the smallest unit of software design-the module. Using the procedural design description as a guide, important control paths are tested to uncover errors within the boundary of the module. The module interface is tested to ensure that the information properly flows into and out of the program unit under test. Boundary conditions are tested to ensure that the module operates properly at the boundaries established to limit of restrict processing.

INTEGRATION TESTING:

Integration testing is a systematic technique for constructing the program structure while conducting test to uncover errors associated with interfacing. The objective is to take unit tested modules and build a program structure that has been dictated by design.

WHITE BOX TESTING

White box testing is some time is called glass box testing, is a test case design that uses a control structure of the procedural design to drive the test cases. Using white-box testing methods, the software engineer can drive test cases that

- Guarantee that logical decisions are on the true and false sides
- Exercise all logical decisions are on the true and false sides
- Execute all loops at their boundaries and within their operational bounds
- Exercise internal data structure to assure the validity
-

ACCEPTANCE TESTING

Finally when the software is completely built, a series of acceptance tests are conducted to enable the client to validate all requirements. The user conducts these tests rather than the system developer, which can range from informal test drive to a planned and systematical executed series of tests.

These acceptance tests are conducted over a period of weeks or months, there by uncovering cumulative errors that might degrade the system order time. In this process alpha testing and beta testing are used to uncover the errors that only the end user seems able to find.

ALPHA TESTING

The customer conducts the alpha test at the developer's site. The client notes the errors and usage problems and gives report to the developer. Alpha tests are conducted in a control environment.

BETA TESTING

The beta testing is conducted at one or more customer's sites by the end users of the software. Unlike the alpha testing, the developer is not present. Therefore a beta test is a "live" application of the software in the environment that cannot be developed by the developer. The customer records all the problems encountered during the beta testing and reports these to the developers at regular intervals.

BLACK BOX TESTING:

Black box testing focuses on the functional requirements of the software. That is black box testing enables the software engineer to drive a set of input conditions that will fully exercise the requirements for a program.

Black box testing is not an alternative for white box testing techniques. Rather, it is a complementary approach that is likely to uncover different class of errors.

Black box testing attempts to find errors in the following categories:

- Interface errors.
- Performances in data structures or external database access.
- Performance errors.
- Initialization and termination errors.
- Incorrect or missing functions.

All the above-mentioned errors were checked in the process of black.

SYSTEM IMPLEMENTATION

The process of putting the developed system to actual use is called as system implementation. This application is successfully developed and implemented.Systems implementation is the construction of the new system and the delivery of that system into production (that is, the day-to-day business or organization operation). The purpose of system implementation is to build and test new networks and modify existing networks for use by the new system.

TYPES OF SYSTEM IMPLEMENTATION

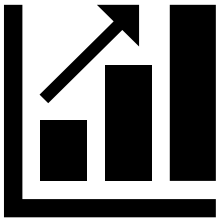
There are three types of implementation

i. Implementation of computer system replaces a manual system.
ii. Implementation of a new computer system to replace an existing one.
iii. Implementation of a modified application to replace an existing one using the same computer.

STEPS INVOLVED

- Converting the project plan, test documentation and implementation plan.
- Converting the old files to the new system using test files, which should contain predictable results, simplified error-finding routines and printed results in seconds.
- Contact parallel processing to detect errors and faults in new system
- Log the computer run for reference, which makes it difficult to cover up problems.
- Discontinue the old system.
- Plan for the post-implementation review that involves evaluating the system in terms of how well performance meets stated objective.

CODING



10. CODING

COLLEGE SELECTION:

DASHBOARD:

```
<?php session_start(); ?>

<?php include("top.php"); ?>

<div class="col-md-12">

<div class="row">

<div class="row">

<?php

include("../dbcon.php");

$username = $_SESSION['college_username'];

$students_count = 0;

$staffs_count = 0;

$blocks = 0;

$area = 0;

$query = "select * from tabadditional where locationid in (select location_id from tabLocation where username='$username')";

if (mysqli_num_rows(mysqli_query($con, $query)) > 0) {

$students_count = mysqli_fetch_array(mysqli_query($con, "select students from tabadditional where locationid in (select location_id from tabLocation where username='$username')"))[0];

$staffs_count = mysqli_fetch_array(mysqli_query($con, "select staffs from tabadditional where locationid in (select location_id from tabLocation where username='$username')"))[0];

$blocks = mysqli_fetch_array(mysqli_query($con, "select blocks from tabadditional where locationid in (select location_id from tabLocation where username='$username')"))[0];

$area = mysqli_fetch_array(mysqli_query($con, "select area from tabadditional where locationid in (select location_id from tabLocation where username='$username')"))[0];

}

?>

<div class="col-md-3">

<div class="card">

<div class="content">

<center class="text-primary">
```

```
<h2><strong><?php echo $students_count; ?>+</strong></h2>
<h4><strong><i class="pe-7s-study"></i> Students</strong></h4>
</center>
</div>
</div>
</div>
<div class="col-md-3">
<div class="card">
<div class="content">
<center class="text-danger">
<h2><strong><?php echo $staffs_count; ?>+</strong></h2>
<h4><i class="pe-7s-users"></i> Staffs</h4>
</center>
</div>
</div>
</div>
<div class="col-md-3">
<div class="card">
<div class="content">
<center class="text-warning">
<h2><strong><?php echo $blocks; ?>+</strong></h2>
<h4><i class="pe-7s-culture"></i> Blocks</h4>
</center>
</div>
</div>
</div>
<div class="col-md-3">
<div class="card">
<div class="content">
<center class="text-success">
<h2><strong><?php echo $area; ?>+</strong></h2>
```

```
<h4><i class="pe-7s-map"></i> Acres</h4>
</center>
</div>
</div>
</div>
</div>
</div>
<div class="row">
<div class="card">
<div class="header">
<h4 class="title">College Information</h4>
<p class="category">Update the College Information</p>
</div>
<div class="content">
<h2><?php echo $_SESSION['college_name']; ?></h2>
</div>
</div>
<div class="card">
<div class="header">
<h4 class="title">Information Progress Level</h4>
</div>
<div class="content">
<div class="progress">
<?php
$progresslevel = 3;
$progresstext = 1;
$location = 0;
$photos = 0;
$management = 0;
$departments = 0;
$fee = 0;
```

```
$transport = 0;

$events = 0;

$hostel = 0;

$library = 0;

$lab = 0;

$gym = 0;

$sports = 0;

$placement = 0;

include("../dbcon.php");

$username = $_SESSION['college_username'];

$query1 = "select * from tablocation where username='$username'";

$result1 = mysqli_query($con, $query1);

if (mysqli_num_rows($result1) > 0)

{

$location = mysqli_num_rows($result1);

$progresslevel = $progresslevel + 2;

$progresstext = $progresstext + 4;

}

$query2 = "select * from tabmanagement where locationid  in (select location_id from tabLocation
where username='$username')";

$result2 = mysqli_query($con, $query2);

if (mysqli_num_rows($result2) > 0)

{

$management = mysqli_num_rows($result2);

$progresslevel = $progresslevel + 5;

$progresstext = $progresstext + 5;

}


$query3 = "select * from tabdepartment where locationid  in (select location_id from tabLocation
where username='$username')";

$result3 = mysqli_query($con, $query3);

if (mysqli_num_rows($result3) > 0)
```

```
{

$departments = mysqli_num_rows($result3);

$progresslevel = $progresslevel + 15;

$progresstext = $progresstext + 15;

}

$query4 = "select * from tabfee where departmentid in (select locationid from tabdepartment where locationid  in (select location_id from tabLocation where username='$username'))";

$result4 = mysqli_query($con, $query4);

if (mysqli_num_rows($result4) > 0)

{

$fee = mysqli_num_rows($result4);

$progresslevel = $progresslevel + 10;

$progresstext = $progresstext + 10;

}

$query5 = "select * from tabtransport where locationid  in (select location_id from tabLocation where username='$username')";

$result5 = mysqli_query($con, $query5);

if (mysqli_num_rows($result5) > 0)

{

$transport = mysqli_num_rows($result5);

$progresslevel = $progresslevel + 5;

$progresstext = $progresstext + 5;

}

$query6 = "select * from tabevents where locationid  in (select location_id from tabLocation where username='$username')";

$result6 = mysqli_query($con, $query6);

if (mysqli_num_rows($result6) > 0)

{

$events = mysqli_num_rows($result6);

$progresslevel = $progresslevel + 5;

$progresstext = $progresstext + 5;

}
```

```
$query7 = "select * from tabhostel where locationid  in (select location_id from tabLocation where username='$username')";

$result7 = mysqli_query($con, $query7);

if (mysqli_num_rows($result6) > 0)

{

$hostel = mysqli_num_rows($result7);

$progresslevel = $progresslevel + 10;

$progresstext = $progresstext + 10;

}

$query8 = "select * from tablibrary where locationid  in (select location_id from tabLocation where username='$username')";

$result8 = mysqli_query($con, $query8);

if (mysqli_num_rows($result8) > 0)

{

$library = mysqli_num_rows($result8);

$progresslevel = $progresslevel + 5;

$progresstext = $progresstext + 5;

}

$query9 = "select * from tablab where locationid  in (select location_id from tabLocation where username='$username')";

$result9 = mysqli_query($con, $query9);

if (mysqli_num_rows($result9) > 0)

{

$lab = mysqli_num_rows($result9);

$progresslevel = $progresslevel + 10;

$progresstext = $progresstext + 10;

}

$query10 = "select * from tabgym where locationid  in (select location_id from tabLocation where username='$username')";

$result10 = mysqli_query($con, $query10);

if (mysqli_num_rows($result10) > 0)

{

$gym = mysqli_num_rows($result10);
```

```
$progresslevel = $progresslevel + 5;

$progresstext = $progresstext + 5;

}

$query11 = "select * from tabsports where locationid  in (select location_id from tabLocation where username='$username')";

$result11 = mysqli_query($con, $query11);

if (mysqli_num_rows($result11) > 0)

{

$sports = mysqli_num_rows($result11);

$progresslevel = $progresslevel + 5;

$progresstext = $progresstext + 5;

}

$query12 = "select * from tabplacement where locationid  in (select location_id from tabLocation where username='$username')";

$result12 = mysqli_query($con, $query12);

if (mysqli_num_rows($result12) > 0)

{

$placement = mysqli_num_rows($result12);

$progresslevel = $progresslevel + 10;

$progresstext = $progresstext + 10;

}

$query13 = "select * from tabphoto where locationid  in (select location_id from tabLocation where username='$username')";

$result13 = mysqli_query($con, $query13);

if (mysqli_num_rows($result13) > 0)

{

$photos = mysqli_num_rows($result13);

$progresslevel = $progresslevel + 10;

$progresstext = $progresstext + 10;

}

?>
```

```
<div class="progress-bar progress-bar-striped bg-success" role="progressbar" aria-valuenow="75" aria-valuemin="0" aria-valuemax="100" style="width: <?php echo $progresslevel; ?>%"><?php echo $progresstext; ?>%</div>

</div>

<table class="table">

<tr>

<th>Information</th>

<th>Detail</th>

<th>Status</th>

</tr>

<tr>

<td>Location</td>

<td><?php echo $location; ?> Location(s)</td>

<td><?php if ($location > 0) { echo "Updated"; } else { echo '<a href="location.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

<tr>

<td>Photos</td>

<td><?php echo $photos; ?> Photo(s)</td>

<td><?php if ($photos > 0) { echo "Updated"; } else { echo '<a href="photos.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

<tr>

<td>Management</td>

<td><?php echo $management; ?> Management(s)</td>

<td><?php if ($management > 0) { echo "Updated"; } else { echo '<a href="management.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

<tr>

<td>Departments</td>

<td><?php echo $departments; ?> Department(s)</td>

<td><?php if ($departments > 0) { echo "Updated"; } else { echo '<a href="courses.php" class="text-primary">Configure</a>'; } ?></td>
```

```
</tr>

<tr>

<td>Fees</td>

<td><?php echo $fee; ?> Fees(s)</td>

<td><?php if ($fee > 0) { echo "Updated"; } else { echo '<a href="fees.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

<tr>

<td>Transport</td>

<td><?php echo $transport; ?> Transport(s)</td>

<td><?php if ($transport > 0) { echo "Updated"; } else { echo '<a href="transport.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

<tr>

<td>Events</td>

<td><?php echo $events; ?> Event(s)</td>

<td><?php if ($events > 0) { echo "Updated"; } else { echo '<a href="events.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

<tr>

<td>Hostel</td>

<td><?php echo $hostel; ?> Hostel(s)</td>

<td><?php if ($hostel > 0) { echo "Updated"; } else { echo '<a href="hostel.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

<tr>

<td>Library</td>

<td><?php echo $library; ?> Library(s)</td>

<td><?php if ($library > 0) { echo "Updated"; } else { echo '<a href="library.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

<tr>

<td>Labratory</td>
```

```
<td><?php echo $lab; ?> Labratory(s)</td>

<td><?php if ($lab > 0) { echo "Updated"; } else { echo '<a href="lab.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

<tr>

<td>Gym</td>

<td><?php echo $gym; ?> Gym(s)</td>

<td><?php if ($gym > 0) { echo "Updated"; } else { echo '<a href="gym.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

<tr>

<td>Sports</td>

<td><?php echo $sports; ?> Sport(s)</td>

<td><?php if ($sports > 0) { echo "Updated"; } else { echo '<a href="sports.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

<tr>

<td>Placements</td>

<td><?php echo $placement; ?> Placement(s)</td>

<td><?php if ($placement > 0) { echo "Updated"; } else { echo '<a href="placement.php" class="text-primary">Configure</a>'; } ?></td>

</tr>

</table>

</div>

</div>

</div>

</div>

<?php include("bottom.php"); ?>
```

SIDE BAR

```
<div class="sidebar-wrapper">

<div class="logo">
```

```
<a href="index.php" class="simple-text">
College Selection
</a>
</div>
<ul class="nav">
<li>
<a href="index.php">
<i class="fa fa-dashboard"></i>
<p>Dashboard</p>
</a>
</li>
<li>
<a href="location.php">
<i class="pe-7s-map-marker"></i>
<p>Locations</p>
</a>
</li>
<li>
<a href="photos.php">
<i class="pe-7s-photo"></i>
<p>Photos</p>
</a>
</li>
<li>
<a href="management.php">
<i class="pe-7s-global"></i>
<p>Management</p>
</a>
</li>
<li>
<a href="department.php">
```

```
<i class="pe-7s-study"></i>
<p>Departments</p>
</a>
</li>
<li>
<a href="fees.php">
<i class="pe-7s-cash"></i>
<p>Fee Details</p>
</a>
</li>
<li>
<a href="transport.php">
<i class="pe-7s-compass"></i>
<p>Transport</p>
</a>
</li>
<li>
<a href="events.php">
<i class="pe-7s-speaker"></i>
<p>Events</p>
</a>
</li>
<li>
<a href="hostel.php">
<i class="pe-7s-culture"></i>
<p>Hostel</p>
</a>
</li>
<li>
<a href="library.php">
<i class="pe-7s-notebook"></i>
```

```
<p>Library</p>
</a>
</li>
<li>
<a href="lab.php">
<i class="pe-7s-users"></i>
<p>Labratory</p>
</a>
</li>
<li>
<a href="gym.php">
<i class="pe-7s-gym"></i>
<p>Gym</p>
</a>
</li>
<li>
<a href="sports.php">
<i class="pe-7s-medal"></i>
<p>Sports</p>
</a>
</li>
<li>
<a href="placement.php">
<i class="pe-7s-target"></i>
<p>Placement</p>
</a>
</li>
<li>
<a href="applied.php">
<i class="pe-7s-users"></i>
<p>List Applied</p>
```

```
</a>

</li>

</ul>

</div>
```

STUDENTS APP

DASHBOARD

```
<?php

session_start();

include("../../dbcon.php");

if (!isset($_SESSION['students_username']))

{

header("Location: ../index.php");

}

if(isset($_POST['btnSearch']))

{

$keyword = $_POST['txtSearch'];

$username = $_SESSION['students_username'];

$record_gender = mysqli_fetch_array(mysqli_query($con, "select gender from tabstudents where username='$username'"))[0];

$gender = $record_gender[0];


$query = "select * from tablocation where institution_name like '%$keyword%' and location_id in (select locationid from tabmanagement where gender in ('Co-ED', '$gender')) or city like '%$keyword%'";

$result = mysqli_query($con, $query);

$records_found = false;

if (mysqli_num_rows($result) > 0)

{

$records_found = true;
```

```
}
else
{
$error_message = "No Records found!";
}
}
?>
<?php include("top.php"); ?>
<div class="card">
<div class="card-header">
<h5 class="card-title">Search</h5>
</div>
<div class="card-body">
<form name="form1" method="post" action="">
<div class="row">
<div class="col-md-10 pr-1">
<div class="form-group">
<input type="text" class="form-control" placeholder="Enter Search Keywords" name="txtSearch" value="<?php if(isset($keyword)) { echo $keyword; } ?>">
</div>
</div>
<div class="col-md-2 pl-1">
<input type="submit" name="btnSearch" value="Search" class="btn btn-primary btn-block" style="margin-top:0px;" />
</div>
</div>
</form>
<?php
if (isset($error_message))
{
include("show_error.php");
}
```

```
?>

<?php

if (isset($records_found))

{

if($records_found == true)

{

echo '<div class="table-responsive">';

echo '<table class="table">';

echo '<thead class=" text-primary">';

echo '<th>Institution Name</th>';

echo '<th>City</th>';

echo '<th>Contact Number</th>';

echo '<th class="text-right">Open</th>';

echo '</thead>';

echo '<tbody>';

while($record = mysqli_fetch_array($result))

{

echo '<tr>';

echo '<td>' . $record[2] . '</td>';

echo '<td>' . $record[6] . '</td>';

echo '<td>' . $record[9] . '</td>';

echo '<td class="text-right"><a href="open.php?LocationID=' . $record[0] . '" class="btn btn-
primary">Open</a></td>';

echo '</tr>';

}

echo '</tbody>';

echo '</table>';

echo '</div>';

}

}

?>
```

```
</div>
</div>
<?php include("bottom.php"); ?>
```

INDEX

```
<?php
session_start();
if (isset($_SESSION['students_username']))
{
header("Location: ./studentsdashboard/");
}

include("../dbcon.php");
if (isset($_POST["btnLogin"]))
{
$username = $_POST['txtUsername'];
$password = $_POST['txtPassword'];
$query = "select * from tabstudents where username='$username' and password='$password'";
$result = mysqli_query($con, $query);
if (mysqli_num_rows($result) > 0)
{
//Login Success
$record = mysqli_fetch_array($result);
$_SESSION['students_username'] = $username;
$_SESSION['students_name'] = $record[0];
header("Location: ./studentsdashboard/");
}
else
{
//Login Failed
```

```
$error_message = "<strong>Login Failed</strong>";
}
}
?>
<!DOCTYPE html>
<html lang="en">
<head>
<title>College Selection</title>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1">

</head>
<body>

<div class="limiter">
<div class="container-login100">
<div class="wrap-login100">
<form name="form1" class="login100-form validate-form p-l-55 p-r-55 p-t-178" method="post" action="">
<span class="login100-form-title">
Students Login
</span>
<div class="wrap-input100 validate-input m-b-16" data-validate="Please enter username">
<input class="input100" type="text" name="txtUsername" placeholder="Username">
<span class="focus-input100"></span>
</div>
<div class="wrap-input100 validate-input" data-validate = "Please enter password">
<input class="input100" type="password" name="txtPassword" placeholder="Password">
<span class="focus-input100"></span>
</div>
<div class="text-right p-t-13 p-b-23">
```

```
</div>
<div class="container-login100-form-btn">
<input type="submit" name="btnLogin" class="login100-form-btn" value="Sign in" />
</div>
<div class="p-t-13 p-b-23">
<?php
if (isset($error_message))
{
include("show_error.php");
}
?>
</div>
<div class="flex-col-c p-t-170 p-b-40">
<span class="txt1 p-b-9">
Don’t have an account?
</span>
<a href="register.php" class="txt3">
Sign up now
</a>
</div>
</form>
</div>
</div>
</div>
</body>
</html>
```

INDEX

```
<?php
session_start();
if (isset($_SESSION['college_username']))
```

```
{
header("Location: ./dashboard/");
}
include("dbcon.php");

if (isset($_POST["btnLogin"]))
{
$username = $_POST['txtUsername'];
$password = $_POST['txtPassword'];

$query = "select * from tabusers where username='$username' and password='$password'";
$result = mysqli_query($con, $query);

if (mysqli_num_rows($result) > 0)
{
//Login Success
$record = mysqli_fetch_array($result);
$_SESSION['college_username'] = $username;
$_SESSION['college_name'] = $record[0];
header("Location: ./dashboard/");
}
else
{
//Login Failed
$error_message = "<strong>Login Failed</strong>";
}
}
?>
<!DOCTYPE html>
<html lang="en">
<head>
```

<title>College Selection</title>

<meta charset="UTF-8">

<meta name="viewport" content="width=device-width, initial-scale=1">

<!--
===
===========================-->

<link rel="icon" type="image/png" href="images/icons/favicon.ico"/>

<!--
===
===========================-->

<link rel="stylesheet" type="text/css" href="vendor/bootstrap/css/bootstrap.min.css">

<!--
===
===========================-->

<link rel="stylesheet" type="text/css" href="fonts/font-awesome-4.7.0/css/font-awesome.min.css">

<!--
===
===========================-->

<link rel="stylesheet" type="text/css" href="vendor/animate/animate.css">

<!--
===
===========================-->

<link rel="stylesheet" type="text/css" href="vendor/css-hamburgers/hamburgers.min.css">

<!--
===
===========================-->

<link rel="stylesheet" type="text/css" href="vendor/animsition/css/animsition.min.css">

<!--
===
===========================-->

<link rel="stylesheet" type="text/css" href="vendor/select2/select2.min.css">

<!--
===
===========================-->

<link rel="stylesheet" type="text/css" href="vendor/daterangepicker/daterangepicker.css">

<!--
===
===========================-->

<link rel="stylesheet" type="text/css" href="css/util.css">

```
<link rel="stylesheet" type="text/css" href="css/main.css">

<!--
===============================================================================
------------------------>

</head>

<body>


<div class="limiter">

<div class="container-login100">

<div class="wrap-login100">

<form name="form1" class="login100-form validate-form p-l-55 p-r-55 p-t-178" method="post"
action="">

<span class="login100-form-title">

College Selection - Login

</span>


<div class="wrap-input100 validate-input m-b-16" data-validate="Please enter username">

<input class="input100" type="text" name="txtUsername" placeholder="Username">

<span class="focus-input100"></span>

</div>


<div class="wrap-input100 validate-input" data-validate = "Please enter password">

<input class="input100" type="password" name="txtPassword" placeholder="Password">

<span class="focus-input100"></span>

</div>


<div class="text-right p-t-13 p-b-23">

</div>

<div class="container-login100-form-btn">

<input type="submit" name="btnLogin" class="login100-form-btn" value="Sign in" />

</div>

<div class="p-t-13 p-b-23">
```

```
<?php
if (isset($error_message))
{
include("show_error.php");
}
?>
</div>
<div class="flex-col-c p-t-170 p-b-40">
<span class="txt1 p-b-9">
Don’t have an account?
</span>
<a href="register.php" class="txt3">
Sign up now
</a>
</div>
</form>
</div>
</div>
</div>

<!--
===============================================================================
========================-->
<script src="vendor/jquery/jquery-3.2.1.min.js"></script>
<!--
===============================================================================
========================-->
<script src="vendor/animsition/js/animsition.min.js"></script>
<!--
===============================================================================
========================-->
<script src="vendor/bootstrap/js/popper.js"></script>
```

```
<script src="vendor/bootstrap/js/bootstrap.min.js"></script>

<!--
============================================================================
========================-->

<script src="vendor/select2/select2.min.js"></script>

<!--
============================================================================
========================-->

<script src="vendor/daterangepicker/moment.min.js"></script>

<script src="vendor/daterangepicker/daterangepicker.js"></script>

<!--
============================================================================
========================-->

<script src="vendor/countdowntime/countdowntime.js"></script>

<!--
============================================================================
========================-->

<script src="js/main.js"></script>


</body>

</html>
```

LOCATION

```
<?php session_start(); ?>

<?php

include("../dbcon.php");

if (isset($_POST["btnAddLocation"]))

{

$username = $_SESSION['college_username'];

$institution_name = $_POST["txtInstitutionName"];

$addressline1 = $_POST["txtAddressLine1"];

$addressline2 = $_POST["txtAddressLine2"];

$addressline3 = $_POST["txtAddressLine3"];
```

```
$city = $_POST["txtCity"];

$state = $_POST["drpState"];

$pin = $_POST["txtPIN"];

$landline = $_POST["txtLandline"];

$mobile = $_POST["txtMobile"];

$email = $_POST["txtEmail"];

$weburl = $_POST["txtURL"];

$query = "insert into tabLocation (username, institution_name, address_line_1, address_line_2, address_line_3, city, state, pin, landline, mobile, email, url) values('$username', '$institution_name', '$addressline1', '$addressline2', '$addressline3', '$city', '$state', '$pin', '$landline', '$mobile', '$email', '$weburl')";

mysqli_query($con, $query);

if (mysqli_affected_rows($con) > 0)

{

$info_message = "Location Information added successfully!";

}

}

?>

<?php include("top.php"); ?>

<div class="col-md-12">

<div class="card">

<div class="header">

<h4 class="title">Location Details</h4>

<p class="category">Update the College Location and Address</p>

</div>

<div class="content">

<form name="form1" method="post" action="">

<div class="row">

<div class="col-md-12">

<div class="form-group">

<label>Institution Name</label>

<input type="text" name="txtInstitutionName" class="form-control" placeholder="Enter the Institution Name" required="required" />
```

```
</div>

</div>

</div>

<div class="row">

<div class="col-md-4">

<div class="form-group">

<label>Address Line 1</label>

<input type="text" name="txtAddressLine1" class="form-control" placeholder="Address Line 1"
required="required" />

</div>

</div>

<div class="col-md-4">

<div class="form-group">

<label>Address Line 2</label>

<input type="text" name="txtAddressLine2" class="form-control" placeholder="Address Line 2"
required="required" />

</div>

</div>

<div class="col-md-4">

<div class="form-group">

<label>Address Line 3</label>

<input type="text" name="txtAddressLine3" class="form-control" placeholder="Address Line 3"
required="required" />

</div>

</div>

</div>

<div class="row">

<div class="col-md-4">

<div class="form-group">

<label>City</label>

<input type="text" name="txtCity" class="form-control" placeholder="Enter City Name"
required="required" />

</div>
```

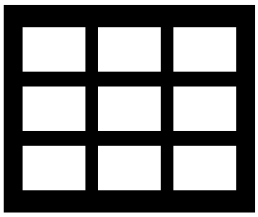
```
</div>

<div class="col-md-4">

<div class="form-group">

<label>State</label>

<select class="form-control" name="drpState">

<option>Tamilnadu</option>

</select>

</div>

</div>

<div class="col-md-4">

<div class="form-group">

<label>PIN Code</label>

<input type="text" name="txtPIN" class="form-control" placeholder="Enter PIN Code"
required="required" />

</div>

</div>

</div>

<div class="row">

<div class="col-md-4">

<div class="form-group">

<label>Landline</label>

<input type="text" name="txtLandline" class="form-control" placeholder="Enter Landline Number"
required="required"  />

</div>

</div>

<div class="col-md-4">

<div class="form-group">

<label>Mobile Number</label>

<input type="text" name="txtMobile" class="form-control" placeholder="Enter Mobile Number"
required="required"  />

</div>

</div>
```

```
<div class="col-md-4">

<div class="form-group">

<label>Email ID</label>

<input type="email" name="txtEmail" class="form-control" placeholder="Enter Email ID"
required="required"  />

</div>

</div>

</div>


<div class="row">

<div class="col-md-12">

<div class="form-group">

<label>Website URL</label>

<input type="url" name="txtURL" class="form-control" placeholder="Enter Website URL"
required="required" value="http://" />

</div>

</div>

</div>


<input type="submit" class="btn btn-primary btn-fill pull-right" name="btnAddLocation"
value="Update Location" />


<div class="row">

<div class="col-md-12">

<?php

if (isset($info_message))

{

include("show_info.php");

}

?>

</div>

</div>
```

```
<div class="clearfix"></div>
</form>
</div>
</div>

<?php
$username = $_SESSION['college_username'];
$query = "select * from tabLocation where username='$username'";
$result = mysqli_query($con, $query);
$location_count = mysqli_num_rows($result);
if ($location_count == 0)
{
echo "<!--";
}
?>
<div class="card">
<div class="header">
<h4 class="title">Available Location List</h4>
</div>
<div class="content table-responsive table-full-width">
<table class="table table-hover table-striped">
<thead>
<tr>
<th>College Name</th>
<th>City</th>
<td align="right" style="padding-right:20px;">Delete</th>
</tr>
</thead>
<tbody>
<?php
while($record = mysqli_fetch_array($result))
```

```
{
echo '<tr>';
echo '<td>' . $record[2] . '</td>';
echo '<td>' . $record[6] . '</td>';
echo '<td align="right"><a href="deletelocation.php?locationid=' . $record[0] . '" class="btn btn-danger">Delete</a></td>';
echo '</tr>';
}
?>
</tbody>
</table>
</div>
</div>
<?php
if ($location_count == 0)
{
echo "-->";
}
?>
</div>
<?php include("bottom.php"); ?>
```

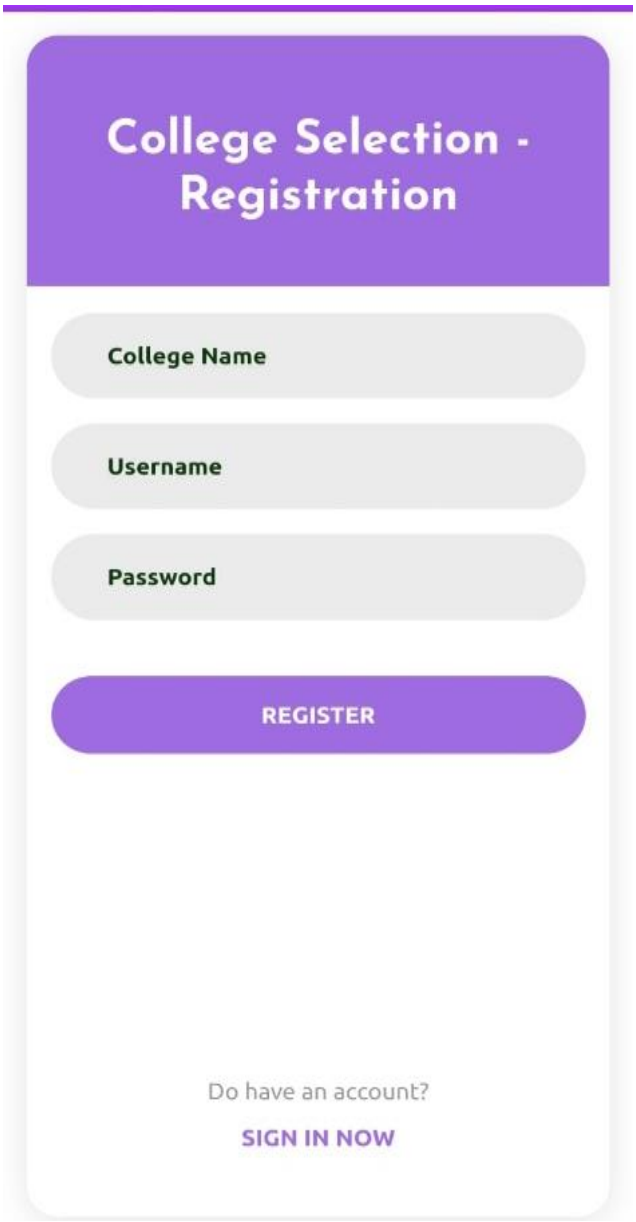
SCREENSHOTS



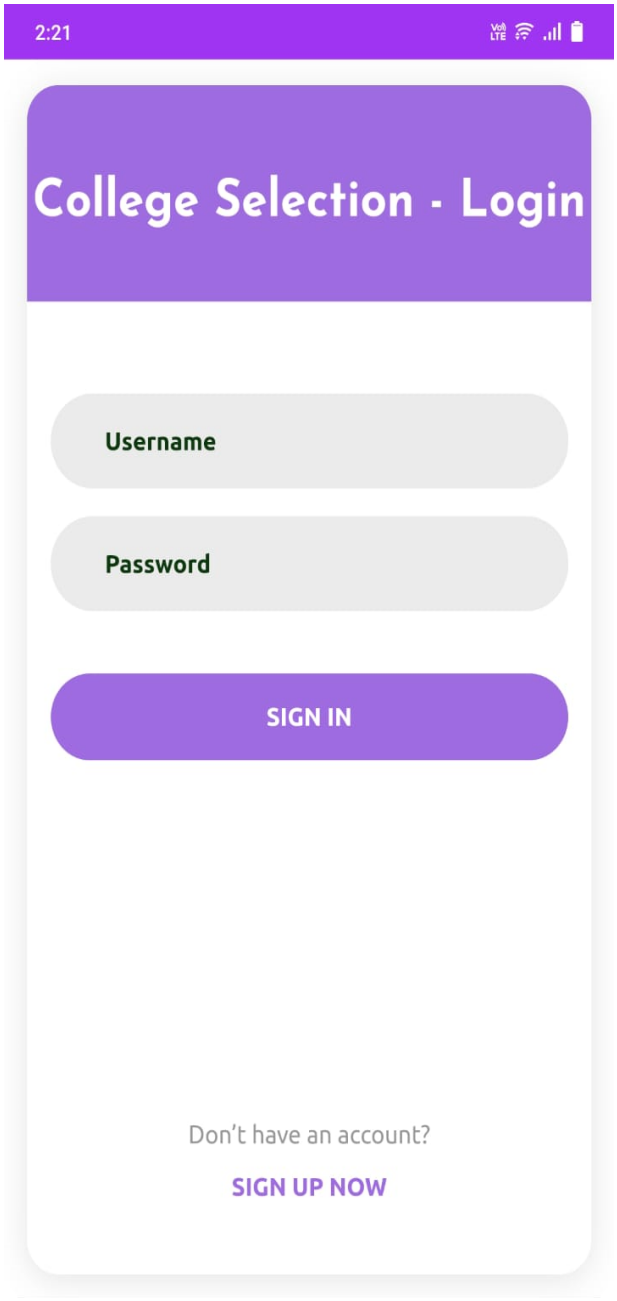
11. SCREENSHOTS

COLLEGE APP

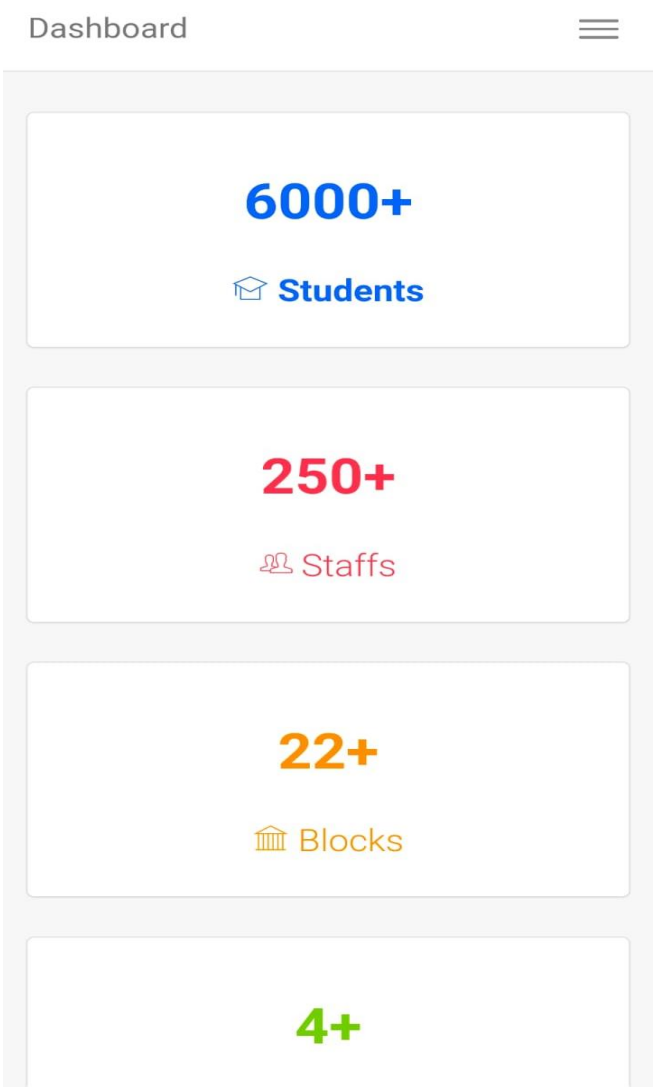
SIGNUP PAGE:



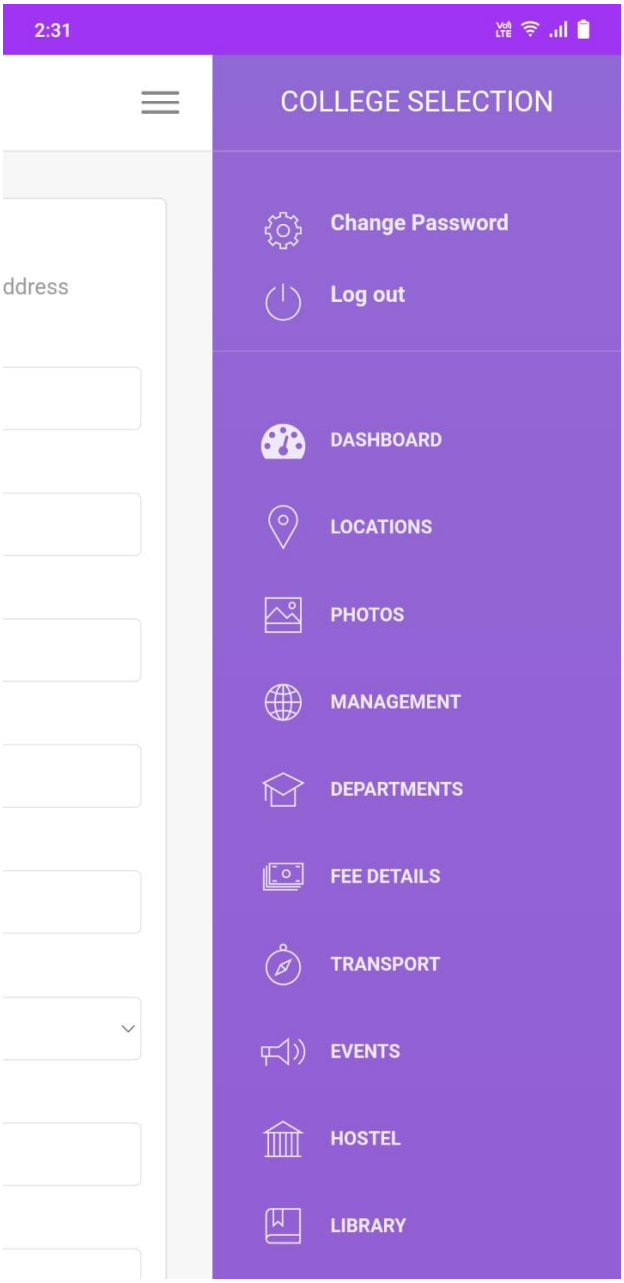
SIGNIN PAGE


2:21
College Selection - Login
Username
Password
SIGN IN
Don't have an account?
SIGN UP NOW

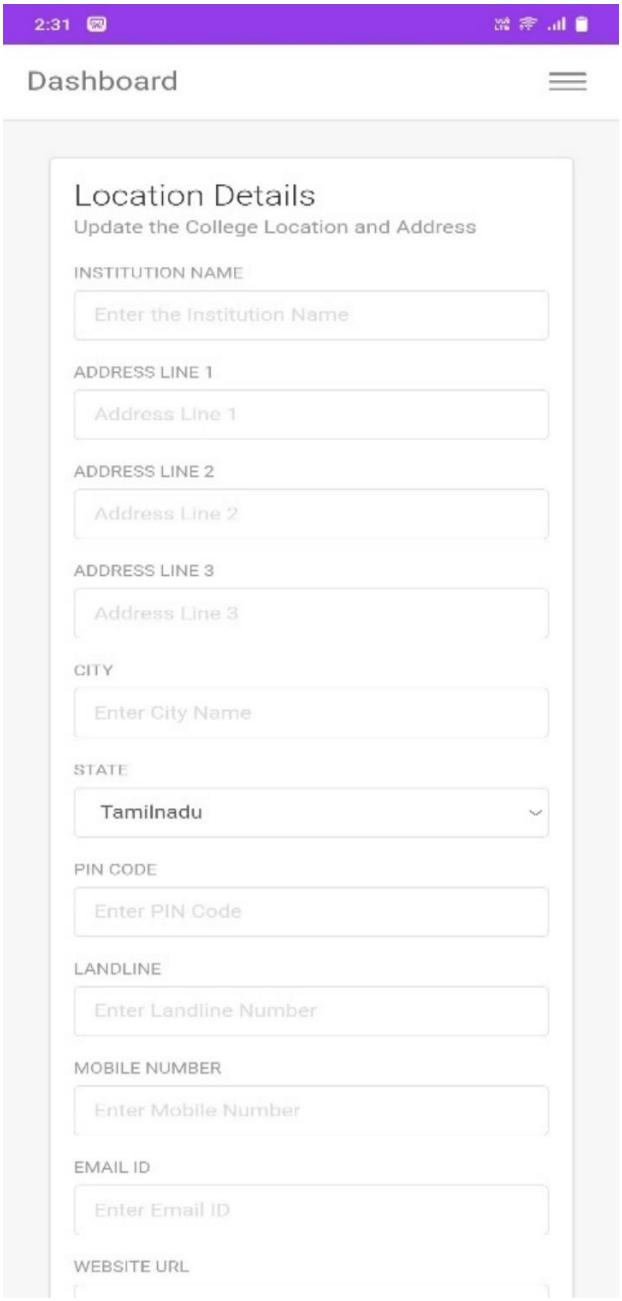
DASHBOARD



SIDEBAR

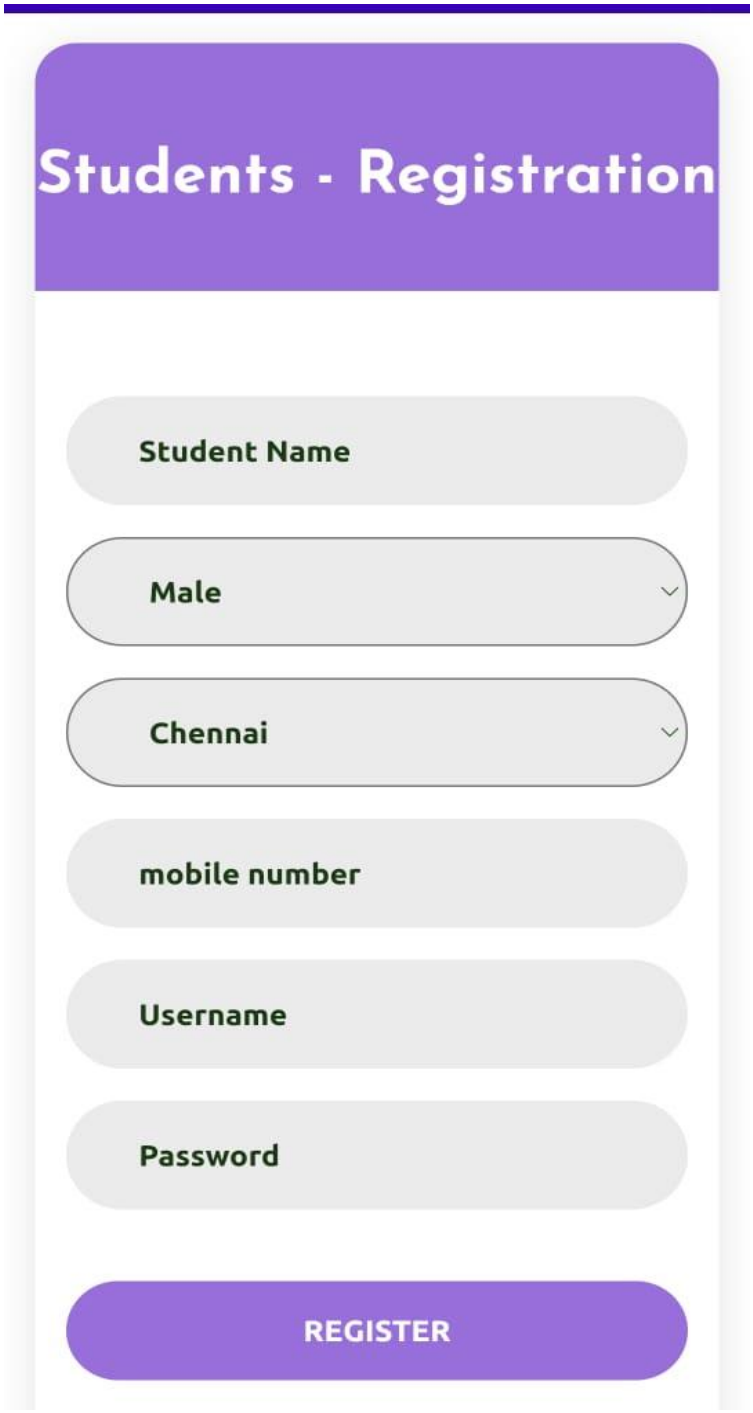

2:31
COLLEGE SELECTION
ddress
Change Password
Log out
DASHBOARD
LOCATIONS
PHOTOS
MANAGEMENT
DEPARTMENTS
FEE DETAILS
TRANSPORT
EVENTS
HOSTEL
LIBRARY

LOCATION

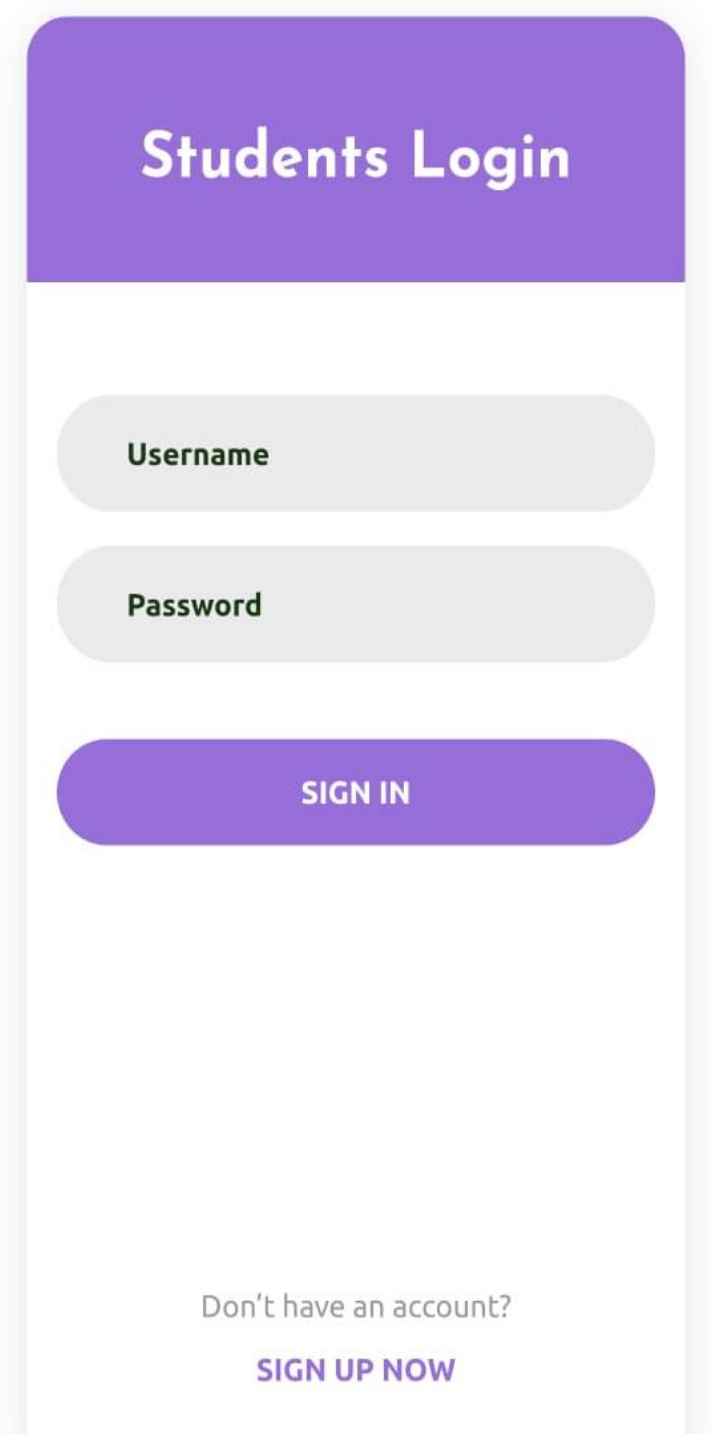

2:31
Dashboard
Location Details
Update the College Location and Address
INSTITUTION NAME
Enter the Institution Name
ADDRESS LINE 1
Address Line 1
ADDRESS LINE 2
Address Line 2
ADDRESS LINE 3
Address Line 3
CITY
Enter City Name
STATE
Tamilnadu
PIN CODE
Enter PIN Code
LANDLINE
Enter Landline Number
MOBILE NUMBER
Enter Mobile Number
EMAIL ID
Enter Email ID
WEBSITE URL

STUDENTS APP

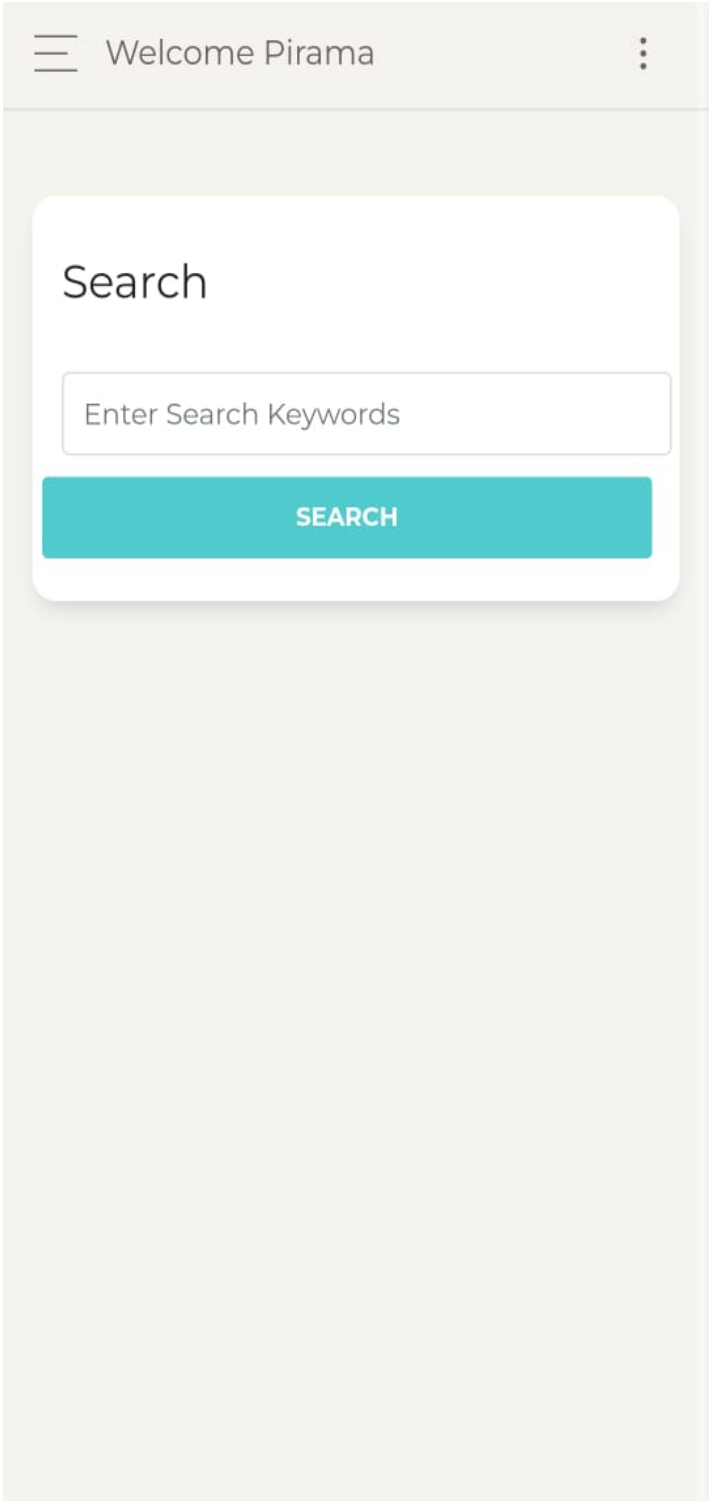
SIGNUP PAGE


Students - Registration
Student Name
Male
Chennai
mobile number
Username
Password
REGISTER

SIGNIN PAGE


Students Login
Username
Password
SIGN IN
Don't have an account?
SIGN UP NOW

DASHBOARD


Welcome Pirama
Search
Enter Search Keywords
SEARCH

CONCLUSION

12. CONCLUSION

Due to the complexities involved in selecting and customising an appropriate method for the assessment of intellectual capital, there is a need for college selection and management support systems to assist with the decision-making process concerning the assessment of intellectual college. This project discusses the functionality of a web portal of such a system. This web portal serves as an example of such a college section, illustrating the kind of functionality intended for systems of this kind. The web portal further contributes by exploring the types of knowledge that can be acquired from case studies and literature reviews.

FUTURE ENHANCEMENT

13. FUTURE ENHANCEMENT

Future work of our research is to develop new versions of College Admin App and Student App that works on Apple operating system. And enable the application with high privacy protection features. Also, applying data mining algorithm will result in students' college search result enhancement, so that they can easily search with limited parameters.

BIBLIOGRAPHY

13. BIBLIOGRAPHY

BOOKS REFERRED

1. Learning PHP, MySQL, JavaScript, CSS & HTML5: A Step-by-Step Guide to Creating Dynamic Websites

   Authors: Robin Nixon

2. PHP: The Complete Reference

   Author: Steven Holzner

3. PHP and MySQL Web Development

   Author: Luke Welling

4. PHP, MySQL, & JavaScript All-in-One For Dummies

   Author: Richard Blum

WEBSITE REFERRED

- https://stackoverflow.com/
- https://www.tutorialspoint.com/android/index.htm
- https://www.javatpoint.com/android-tutorial
- https://www.vogella.com/tutorials/android.html

SPEED DETERMINATION OF VEHICLES USING IMAGE LEVEL FEATURES

A project submitted to

ST.MARY'S COLLEGE (Autonomous), Thoothukudi

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

In partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

J. PRAVEENA

Reg.No:20SPCS15

Under the Supervision and
Guidance of

Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D.,

PG DEPARTMENT OF COMPUTER SCIENCE(SSC)

St.Mary's College (Autonomous), Thoothukudi-628001

May 2022

CERTIFICATE

This is to certify that this project work entitled **" SPEED DETERMINATION OF VEHICLES USING IMAGE LEVEL FEATURES "** is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to **Manonmaniam Sundaranar University, Tirunelveli,** in partial fulfillment for the award of the degree of Master of Science in Computer Science for the work done during the year 2021-2022 by **J. PRAVEENA (Reg.No.20SPCS15).**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do here by declare that, the project entitled **"SPEED DETERMINATION OF VEHICLES USING IMAGE LEVEL FEATURES"** submitted for the degree of Master of Science in Computer Science is my original work carried out under the guidance of **Dr. A. Vithya Vijayalakshmi MCA, M.Phil., Ph.D.,** Assistant Professor, PG Department of Computer Science (SSC), St.Mary's College (Autonomous), Thoothukudi**.**

Station: Thoothukudi **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Sr. Josephine Jeyarani , Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms.C.Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and SSC Coordinator, PG Department of Computer Science (SSC), for her support and counsel.

I express my hearty thanks to my guide Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC),for her support and counsel. For her valuable suggestions, gentle guidance, enthusiastic ideas, to carry out and complete my work entirely.

I also express my boundless thanks to Ms. A. Jenitta Jebamalar M.Sc (IT)., M.Sc (CS)., M.Phil., B.Ed., Assistant professor, PG Department of Computer Science (SSC),for their kind cooperation in successful completion of the project.

I am much indebted to Dr.P.Johnson Durai Raj,Director, Postulate Infotech for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

POSTULATE

14-05-2022

To

The Head of the Department

PG Department of Computer Science (SSC)

St. Mary's College (Autonomous)

Thoothukudi

Dear Sir/Madam,

Sub: Project Completion Certificate-Reg

On behalf of **POSTULATE**, We are pleasure to inform you that **Ms. J. Praveena, Reg No: 20SPCS15** studying **Master of Computer Science** Final year has been done the project work at our concern on **"SPEED DETERMINATION OF VEHICLES USING IMAGE LEVEL FEATURES"** during the period from February 2022 to May 2022.

During this period, we noticed her to be diligent, sincere and hardworking and she accomplished her task within stipulated deadline. We wish her for all future endeavors.

POSTULATE INFO TECH Thoothukudi

K.H.V.

PROJECT DIRECTOR

ABSTRACT

This project aims at determining vehicle speed which is necessary for traffic surveillance systems. These systems are very much useful to monitor and manage various traffic conditions such as traffic management, prevention of accident, also secure transportation. This approach localize target vehicles in video under various environmental conditions. The extracted geometry features from the video are continuously projected onto a profile and are constantly tracked. We rely on temporal information of features and their motion behaviors for vehicle identification, which compensates for the complexity in recognizing vehicle shapes, colors, and types. In speed determination vehicle detection and vehicle tracking are the key steps. To overcome the disadvantages of traditional methods, here, vehicle speed determination using image processing is done with Python language and OpenCV library. In this paper, the proposed method consists of few basic steps background subtractions, feature extraction, vehicle tracking etc. The speed is determined using distance travelled by vehicle over number of frames and frame rate.

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1. INTRODUCTION

Nowadays, with the continuous increase of vehicle in the road, traffic management authority requires better traffic surveillance system. With more vehicles, the number of accidents on the road rises up each year. Speed is now the single biggest cause of road accidents. Enforcing speed limit is one of the ways to eliminate speed related accidents. Traffic surveillance systems for vehicle detection and speed measurement play an important role in enforcing speed limits. They also provide relevant data for traffic control such as vehicle speed, traffic count etc. Those systems are divided in intrusive and non-intrusive sensors. Intrusive sensors are usually based on inductive loop detectors. Although these sensors are used widely, they have complex installation and high maintenance, promotes asphalt deterioration and also can be damaged by wear and tear. It also requires line sight connection between vehicle and the equipment. Apart from this, due to high cost of equipment and less accuracy, it is losing its popularity. Non-intrusive sensors, which include laser meters and doppler radars, avoid these problems, but are usually more expensive and require frequent maintenance. The project aims to overcome this challenging task of speed determination by providing an economic solution. Due to the availability of cheaper cameras which are able to produce images with higher quality, video-based systems are by far the most inexpensive alternate for non-intrusive speed measurement. In fact, existing systems are often connected to video cameras that record the license plates of vehicles that exceed the speed limit thus; the infrastructure for such systems is already available in most cases. Image processing is a convenient technique to analyze videos and extract information.

2. SYSTEM SPECIFICATION

HARDWARE REQUIREMENT:

- Processor - Pentium –IV
- Speed - 1.1 GHz
- RAM - 512 MB (min)
- Hard Disk - 40 GB
- Floppy Drive - 1.44 MB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA
- Camera - Web Camera

SOFTWARE REQUIREMENTS:

- Operating System : Windows XP or Win7
- Tools : Python, OpenCV
- Document : MS-Office 2007

3. PROJECT DESCRIPTION

The vehicle movement was recorded. First, we convert the video into the frames. We capture the video for image processing, Using OpenCV read function we get each frame. We extract no.of.frames, frame rate, frame size by pre-processing. Then we transform each frame into plain sheet to find position of vehicle. Grayscale Conversion is performed on each video frame. Then we remove noise and edges by using appropriate filter. We detect vehicles by using Image Segmentation. We convert grey scale images into binary images. Then we remove the noise from the imperfect segmentation. Finally, Feature Extraction and Vehicle Tracking was performed. After Tracking, the speed of the vehicle was determined.

4. MODULE DESCRIPTION

Speed Determination Of Vehicles Using Image Level Features has 9 Modules:

- Pre-Processing
- Perspective Transformation
- Grayscale Image Generation
- Image Blurring
- Image Segmentation
- Thresholding
- Morphological Operations
- Feature Extraction & Vehicle Tracking
- Speed Determination

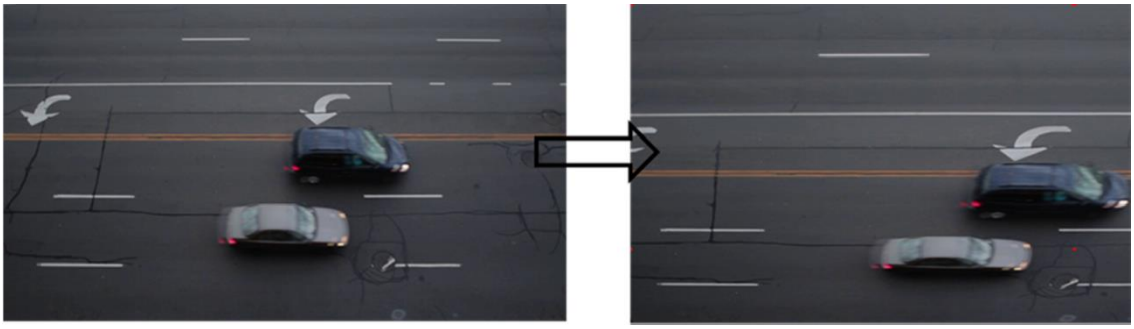
Pre-Processing

A camera has been used for recording vehicle movement. Before even beginning the image processing, it is vital to convert the video into the frames. In pre-processing the video has converted into the frames. At first, cv2.VideoCapture function is used where the video is passed as an argument. This helps load up the video for image processing. In OpenCV, the read function is used to get each frame. The various parameters such as number of frames, frame rate, frame size are extracted in pre-processing. There are a total of 1244 frames in this video. It has a frame rate 24 frames per second. The frame size is of 1920x1080 pixels, which has been retrieved using the shape function. The get function has been used to obtain these information but with different flags. The flags cv2.CAP_PROP_FPS and cv2.CAP_PROP_FRAME_COUNT are for frame rate and frame count respectively.

Perspective Transformation

Perspective transformation helps to reduce error in speed estimation. A video can be taken from any angle but it is essential to align it with the global coordinate. Since we can find the pixel covering the length and width of an image and pixel value for any angular dimension cannot be found, it is necessary to perform perspective transformation. The purpose of this is to transform each frame into a plain sheet so that position of any vehicle can be found from the

pixel values. In OpenCV it is done with *cv2.warpPerspective* function. The result of perspective transformation is shown as



Example of perspective transformation

Grayscale Image Generation

Generating grayscale image is a vital step towards detecting single or multiple vehicles. With grayscale image, not only speed of image processing can be improved but also unnecessary noise contributed by colored images can be avoided. Therefore, an RGB to grayscale conversion is performed on each video frame. Among several grayscale transformations, the simplest form of grayscale transformation has been used in this work. For color conversion we use the function *cv2.cvtColor (input_image, flag)* where flag determines the type of conversion. To convert to grayscaleweuseflag*cv2.COLOR_BGR2GRAY*.Theresultofgrayscaleimageisshown

Example of grayscale image generation

Image Blurring

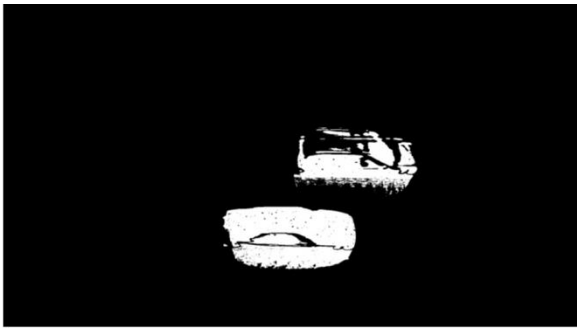
Image blurring is used for removing noise and edges, which is achieved by convolving the image with a low-pass filter kernel. Among all the filtering methods offered in OpenCV, Gaussian Filter has been used here. It uses a Gaussian function for calculating the transformation to apply to each pixel in the image. It is done with the function, *cv2.GaussianBlur (image, kernel size, sigmaX,sigmaY).* The width and height of the kernel should be positive and odd. The standard deviation in the X and Y directions are sigmaX and sigmaY respectively. For our proposal, *cv2.GaussianBlur (image, (5, 5), 0)* has been used.

Image Segmentation

Image segmentation is a major step in image processing to detect vehicles. It helps to extract the moving foreground from static background. For proposed method, a widely used technique for detecting moving objects from a video, called background subtraction has been used. . It provides good results in segmentation, and allows automating the process when foreground color of images is not constant, as well as speeds it up significantly. A Gaussian Mixture-based Background/Foreground Segmentation Algorithm, called *cv2.createBackgroundSubtractorMOG2* has been used in this work. As a part of background subtraction, average image scene is created by accumulating all images. The difference between the Current Frame and the Existing Average has been kept to further assist in vehicledetection.

Thresholding

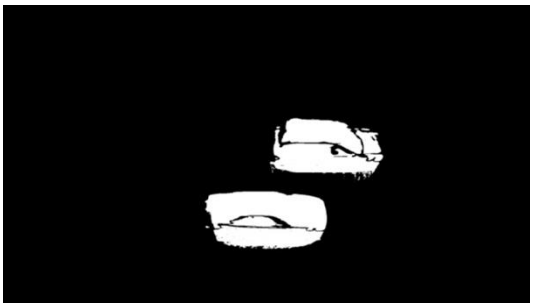
Thresholding is one of the ways for image segmentation. It converts grey scale image to binary image. A binary image can be converted to any format. The function used is *cv2.threshold*. First argument is the source image, which should be a grayscale image. Second argument is the threshold value which is used to classify the pixel values. Third argument is the maxVal which represents the value to be given if pixel value is more than (sometimes less than) the threshold value. The result of image thresholding is shown as.



Example of thresholding

Morphological Operations

They are generally used to remove noise from imperfect segmentation. Morphological operations are especially suited for binary images. So they are performed on output image of thresholding. Here opening, closing and dilation are performed. Opening and closing is used to remove holes in the detected foreground. Dilation is interaction of structuring element and foreground pixels. The structuring element is nothing but a small binary image. In the process of dilation the size and shape determination of structuring element is very important. Dilation is performed before thresholding. Opening and closing are done after thresholding. The results of these morphological operations are shown in Figure 4. After this, the selected object pixels are applied for connected component analysis.



Example of morphological operations

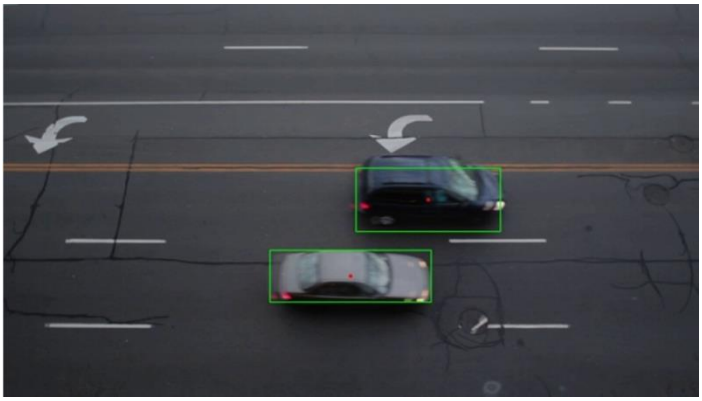
Feature Extraction & Vehicle Tracking

Feature extraction is the key aspect in moving vehicle tracking. The more literature is available on various methods of feature extraction. Features are nothing but some of the characteristics of detected vehicle such as position, speed, color, shape, centroid, edges etc. the steps to feature extraction and vehicle tracking are given below.

(i) Firstly, contour is defined using the function *cv2.findcontour*. This function also helps to provide center for the contour area.

(ii) As the primary purpose of this work is to determine the vehicle speed, other objects like trees, pedestrians etc. need to be avoided while processing. This can be possible by defining a minimum area to be detected and contoured.

(iii) Vehicles are tracked from the distance of centers from one frame to another frame. The results of vehicle tracking are shown in Figure6.



Example of vehicle tracking

Speed Determination

Finally, once the vehicles are tracked, we can determine the speed of vehicles on the road. Vehicles are tracked from the distance of centers from one frame to another frame. The real world distance is needed to be mapped on the image. It is convenient to take the real world distance as the same length as the image width since image width can be found using OpenCV library. Euclidean distance of two consecutive center of a blob is taken as the pixel distance.

Frame rate of the video can be found from OpenCV library. Total time taken for a vehicle to pass the screen can be found from dividing image width by framerate.

Total time = Image width / Frame rate

Speed of the vehicle is then found from dividing the multiplication of real world distance and pixel distance by total time.

Speed = (Pixel distance * real world distance)/ Total time.

Finally, the speed detection using the technique can be shown using by the pipeline

5. SYSTEM STUDY

EXISTING SYSTEM

Vehicle speed detection is used to estimate the velocity of the moving vehicle using image and video processing techniques. Frame masking is used to differentiate between one or more vehicles. The captured traffic movies are collected with a stationary camera which is mounted on a freeway. The camera was calibrated based on geometrical equations that were supported directly by using references. Camera calibration for exact measurements may be possible while accurate speed estimation can still be quite difficult to achieve.

DRAWBACKS OF EXISTING SYSTEM

- Cost of equipment
- Shading (radar wave reflection from two different vehicles with distinctive heights)
- Radio interference

PROPOSED SYSTEM

The proposed system overcomes the disadvantages of traditional methods. This project aims at determining vehicle speed which is necessary for traffic surveillance systems. Vehicle speed determination using image processing is done with Python language and OpenCV library. In speed determination vehicle detection and vehicle tracking are the key steps. We rely on temporal information of features and their motion behaviours for vehicle identification, which compensates for the complexity in recognizing vehicle shapes, colours, and types.

ADVANTAGES OF PROPOSED SYSTEM

The speed is determined using distance travelled by vehicle over number of frames and frame rate. These systems are very much useful to monitor and manage various traffic conditions such as traffic management, prevention of accident, also secure transportation. This approach localize target vehicles in video under various environmental conditions. In this paper, the proposed method consists of few basic steps background subtractions, feature extraction, vehicle tracking, etc.

6. SYSTEM ANALYSIS

FEASIBILITY STUDY

Depending on the results of the initial investigation, the survey is expanded to a more detailed feasibility study. An important outcome of the preliminary investigation is the determination that the system requested is feasible. A feasibility study is a test of a system proposal according it its workability, impact on the organization, ability to meet user needs, and effective use of the resources.

It focuses on three major questions;

- What are the user's demonstrable needs and how does a candidate system meet them?
- What resources are available for given candidate system? Is the problem worth solving?
- What are the likely impacts of the candidate system on the organization's master Management Information System (MIS) plan?

Each of these questions must be answered carefully. They revolve around investigation and evaluation of the problem, identification and description of candidate systems, specifications of performance and the cost of each system and final selection of the best system. The objective of a feasibility study is not to solve the problem but to acquire a sense of its scope. During the study, the problem definition is crystallized and aspects of the problem to be included in the system are determined. Consequently, costs and benefits are estimated with greater accuracy at this stage. There are three aspects in the feasibility study portion of the preliminary investigation.

TECHNICAL FEASIBLITY

Can the work for the project with current requirement, existing software technology and available personnel? If new technology is required, what will is the likelihood that it can be developed? The technical issues usually raised during the feasibility stage of the investigation include these:

- Does the necessary technology exist to do what is suggested?
- Does the proposed equipment have the technical capacity to hold the data required to use the new system?
- Will the proposed system provide adequate responses to inquiries regardless of the number or location of user?
- Can the system be extended if developed?
- Are there technical guarantees of accuracy, reliability, ease of access and data security?

In the light of the questions raised above, we can say with confidence that the proposed system does have technical feasibility. The packages selected provide us with ample facilities for designing, interface and coding to achieve the complete goals of the proposed system. Further, the proposed system has the technical capacity to hold the data required to use the new system.

We can also point out that, the new system is network based and it can provide with proper response to inquiries regardless of the number or location of user. It facilitates multi-user system with varying access permissions. Though, the related data is shared across the users, the response to inquiries can be made fast and efficiently. Another important aspect is that, the proposed system can be further extended if developed. There are various options kept open to achieve this goal. Moreover, the type of database used and the type of access permissions set guarantees accuracy, reliability, ease of use (access) and data security. Hence we can conclude that the proposed system is technically feasible.

ECONOMIC FEASIBILITY:

A system that can be developed technically and that will be used if installed must still be good investment for the organization. Financial benefits must equal or exceed the costs.

The financial and economic questions raised by analysis during the preliminary investigation are for the purpose of estimating the following;

- The cost to conduct a full system investigation
- The cost of hardware and software of the class of application being considered.
- The benefits in the form of reduced cost or fewer costly errors.

- The cost if nothing changes (i.e., the proposed system is not developed)
- Are there sufficient benefits in creating the system to make the costs acceptable? Or, is the cost of not creating the system so great that the project must be undertaken.

BEHAVIORAL FEASIBILITY:

The proposed system is economically feasible as it is undertaken as an academic project not as a commercial one. The proposed system will have much superior security and performance capabilities.The benefits will exceed much from the development cost. Hence, we see that the project is economically feasible and the project must be undertaken.

OPERATIONAL FEASIBILITY:

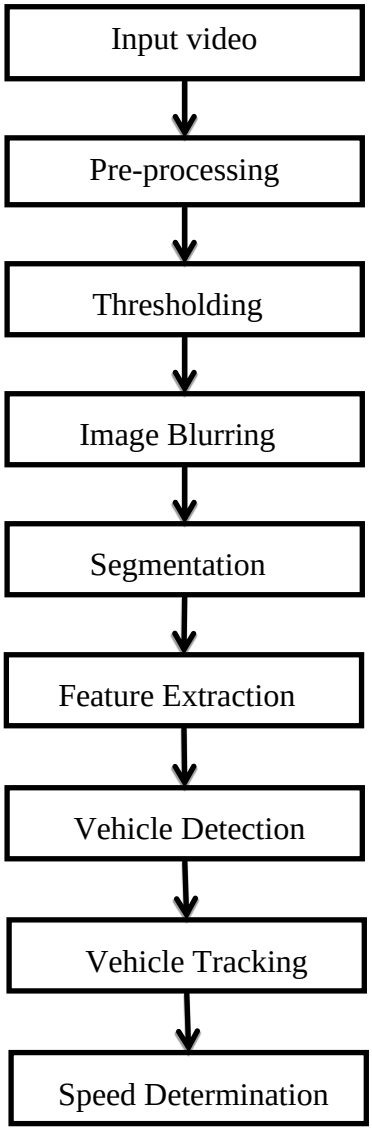
Proposed projects are beneficial only if they can be turned into information systems that will meet the organization's operating requirements. Simply stated, this test of feasibility asks, will the system be used if it is developed and implemented?

Will there be resistance from users that will undermine the possible application benefits? Here are the questions that will help to test operational feasibility of a project

- Is there sufficient support for the project from management? From user? If current system is well liked and used to the extent that persons will not be able to see reasons for a change, there may be resistance.
- Are current business methods acceptable to the users?
- Have the users been involved in planning and development of the project?
- Will the proposed system cause harm? Will it produce poorer results in any respect or area? Will individual performance will be poorer after implementation than before?
- All operational aspects must be considered carefully.

The project has been developed at the request of the management to improve the monitoring of the vehicle speed determination. The proposed system is very harmless and expected to produce the best results. Hence, we see that the project is economically feasible. As we see that, the project is feasible in all the aspects

7. SYSTEM DESIGN



8. CODING

Vehicle_detection_speed.py

```
# Imports
import numpy as np
import os
#import six.moves.urllib as urllib
#import sys
#import tarfile
import tensorflow as tf
#import zipfile
import cv2
#import numpy as np
import csv
#import time
#from collections import defaultdict
#from io import StringIO
#from matplotlib import pyplot as plt
#from PIL import Image
# Object detection imports
from utils import label_map_util
from utils import visualization_utils as vis_util
# initialize .csv
with open('traffic_measurement.csv', 'w') as f:
    writer = csv.writer(f)
```

```
    csv_line = \
        'Vehicle Type/Size, Vehicle Color, Vehicle Movement Direction, Vehicle Speed (km/h)'
    writer.writerows([csv_line.split(',')])


if tf.__version__ < '1.4.0':
    raise ImportError('Please upgrade your tensorflow installation to v1.4.* or later!'
                      )
# input video
cap = cv2.VideoCapture('sub-1504614469486.mp4')
# Variables
total_passed_vehicle = 0  # using it to count vehicles
# By default I use an "SSD with Mobilenet" model here. See the detection model zoo (https://github.com/tensorflow/models/blob/master/research/object_detection/g3doc/detection_model_zoo.md) for a list of other models that can be run out-of-the-box with varying speeds and accuracies.
# What model to download.
MODEL_NAME = 'ssd_mobilenet_v1_coco_2017_11_17'
MODEL_FILE = MODEL_NAME + '.tar.gz'
DOWNLOAD_BASE = \
    'http://download.tensorflow.org/models/object_detection/'
# Path to frozen detection graph. This is the actual model that is used for the object detection.
PATH_TO_CKPT = MODEL_NAME + '/frozen_inference_graph.pb'
# List of the strings that is used to add correct label for each box.
PATH_TO_LABELS = os.path.join('data', 'mscoco_label_map.pbtxt')
NUM_CLASSES = 90
# Download Model
```

```
# uncomment if you have not download the model yet

# Load a (frozen) Tensorflow model into memory.

detection_graph = tf.Graph()

with detection_graph.as_default():

    od_graph_def = tf.compat.v1.GraphDef()

    with tf.io.gfile.GFile(PATH_TO_CKPT, 'rb') as fid:

        serialized_graph = fid.read()

        od_graph_def.ParseFromString(serialized_graph)

        tf.import_graph_def(od_graph_def, name='')

# Loading label map

# Label maps map indices to category names, so that when our convolution network predicts 5, we know that this corresponds to airplane. Here I use internal utility functions, but anything that returns a dictionary mapping integers to appropriate string labels would be fine

label_map = label_map_util.load_labelmap(PATH_TO_LABELS)

categories = label_map_util.convert_label_map_to_categories(label_map,

        max_num_classes=NUM_CLASSES, use_display_name=True)

category_index = label_map_util.create_category_index(categories)

# Helper code

def load_image_into_numpy_array(image):

    (im_width, im_height) = image.size

    return np.array(image.getdata()).reshape((im_height, im_width,

            3)).astype(np.uint8)

# Detection

def object_detection_function():

    total_passed_vehicle = 0

    speed = 'waiting...'
```

```
direction = 'waiting...'
size = 'waiting...'
color = 'waiting...'
with detection_graph.as_default():
    with tf.compat.v1.Session(graph=detection_graph) as sess:
        # Definite input and output Tensors for detection_graph
        image_tensor = detection_graph.get_tensor_by_name('image_tensor:0')
        # Each box represents a part of the image where a particular object was detected.
        detection_boxes = detection_graph.get_tensor_by_name('detection_boxes:0')

        # Each score represent how level of confidence for each of the objects.
        # Score is shown on the result image, together with the class label.
        detection_scores = detection_graph.get_tensor_by_name('detection_scores:0')
        detection_classes = detection_graph.get_tensor_by_name('detection_classes:0')
        num_detections = detection_graph.get_tensor_by_name('num_detections:0')
        # for all the frames that are extracted from input video
        while cap.isOpened():
            (ret, frame) = cap.read()
            if not ret:
                print ('end of the video file...')
                break
            input_frame = frame
            # Expand dimensions since the model expects images to have shape: [1, None, None,
3]
            image_np_expanded = np.expand_dims(input_frame, axis=0)
```

```
# Actual detection.
(boxes, scores, classes, num) = \
    sess.run([detection_boxes, detection_scores,
            detection_classes, num_detections],
            feed_dict={image_tensor: image_np_expanded})
print(frame.shape)
# Visualization of the results of a detection.
(counter, csv_line) = \
    vis_util.visualize_boxes_and_labels_on_image_array(
    cap.get(1),
    input_frame,
    np.squeeze(boxes),
    np.squeeze(classes).astype(np.int32),
    np.squeeze(scores),
    category_index,
    use_normalized_coordinates=True,
    line_thickness=4,
    )
total_passed_vehicle = total_passed_vehicle + counter
# insert information text to video frame
font = cv2.FONT_HERSHEY_SIMPLEX
cv2.putText(
    input_frame,
    'Detected Vehicles: ' + str(total_passed_vehicle),
    (10, 35),
```

```
    font,
    0.8,
    (0, 0xFF, 0xFF),
    2,
    cv2.FONT_HERSHEY_SIMPLEX,
    )
# when the vehicle passed over line and counted, make the color of ROI line green
if counter == 1:
    cv2.line(input_frame, (0, 200), (640, 200), (0, 0xFF, 0), 5)
else:
    cv2.line(input_frame, (0, 200), (640, 200), (0, 0xFF, 0), 5)
    cv2.line(input_frame, (0, 200), (640, 200), (0, 0, 0xFF), 5)
# insert information text to video frame
cv2.rectangle(input_frame, (10, 275), (230, 337), (180, 132, 109), -1)
cv2.putText(
    input_frame,
    'ROI Line',
    (545, 190),
    font,
    0.6,
    (0, 0, 0xFF),
    2,
    cv2.LINE_AA,
    )
cv2.putText(
```

```
    input_frame,
    'LAST PASSED VEHICLE INFO',
    (11, 290),
    font,
    0.5,
    (0xFF, 0xFF, 0xFF),
    1,
    cv2.FONT_HERSHEY_SIMPLEX,
    )
cv2.putText(
    input_frame,
    '-Movement Direction: ' + direction,
    (14, 302),
    font,
    0.4,
    (0xFF, 0xFF, 0xFF),
    1,
    cv2.FONT_HERSHEY_COMPLEX_SMALL,
    )
cv2.putText(
    input_frame,
    '-Speed(km/h): ' + speed,
    (14, 312),
    font,
    0.4,
```

```
    (0xFF, 0xFF, 0xFF),
    1,
    cv2.FONT_HERSHEY_COMPLEX_SMALL,
    )
cv2.putText(
    input_frame,
    '-Color: ' + color,
    (14, 322),
    font,
    0.4,
    (0xFF, 0xFF, 0xFF),
    1,
    cv2.FONT_HERSHEY_COMPLEX_SMALL,
    )
cv2.putText(
    input_frame,
    '-Vehicle Size/Type: ' + size,
    (14, 332),
    font,
    0.4,
    (0xFF, 0xFF, 0xFF),
    1,
    cv2.FONT_HERSHEY_COMPLEX_SMALL,
    )
```

```
            cv2.imshow('vehicle detection', input_frame)


            if cv2.waitKey(1) & 0xFF == ord('q'):
                break
            if csv_line != 'not_available':
                with open('traffic_measurement.csv', 'a') as f:
                    writer = csv.writer(f)
                    (size, color, direction, speed) = \
                        csv_line.split(',')
                    writer.writerows([csv_line.split(',')])
        cap.release()
        cv2.destroyAllWindows()
object_detection_function()
```

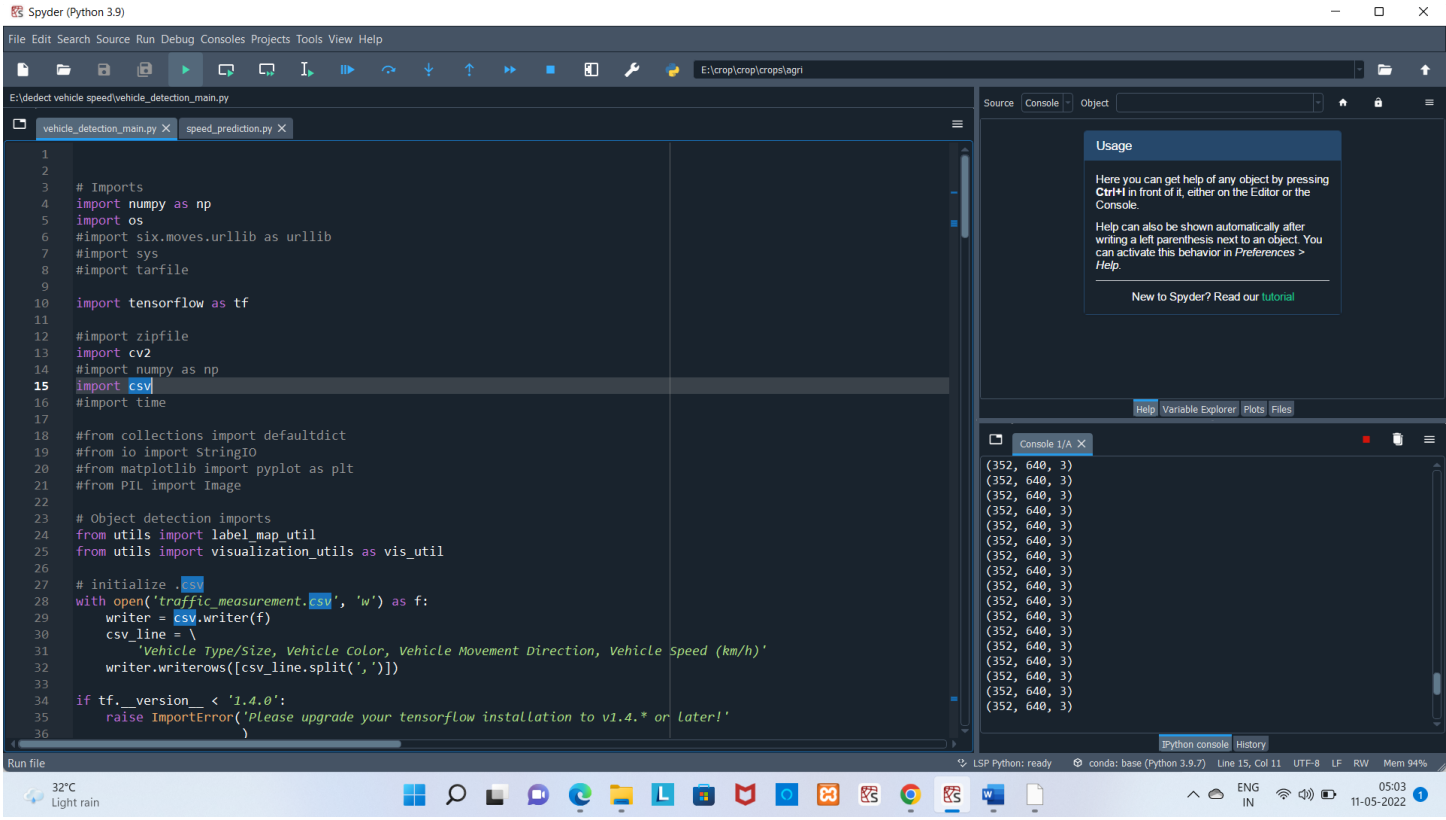
speed_prediction.py

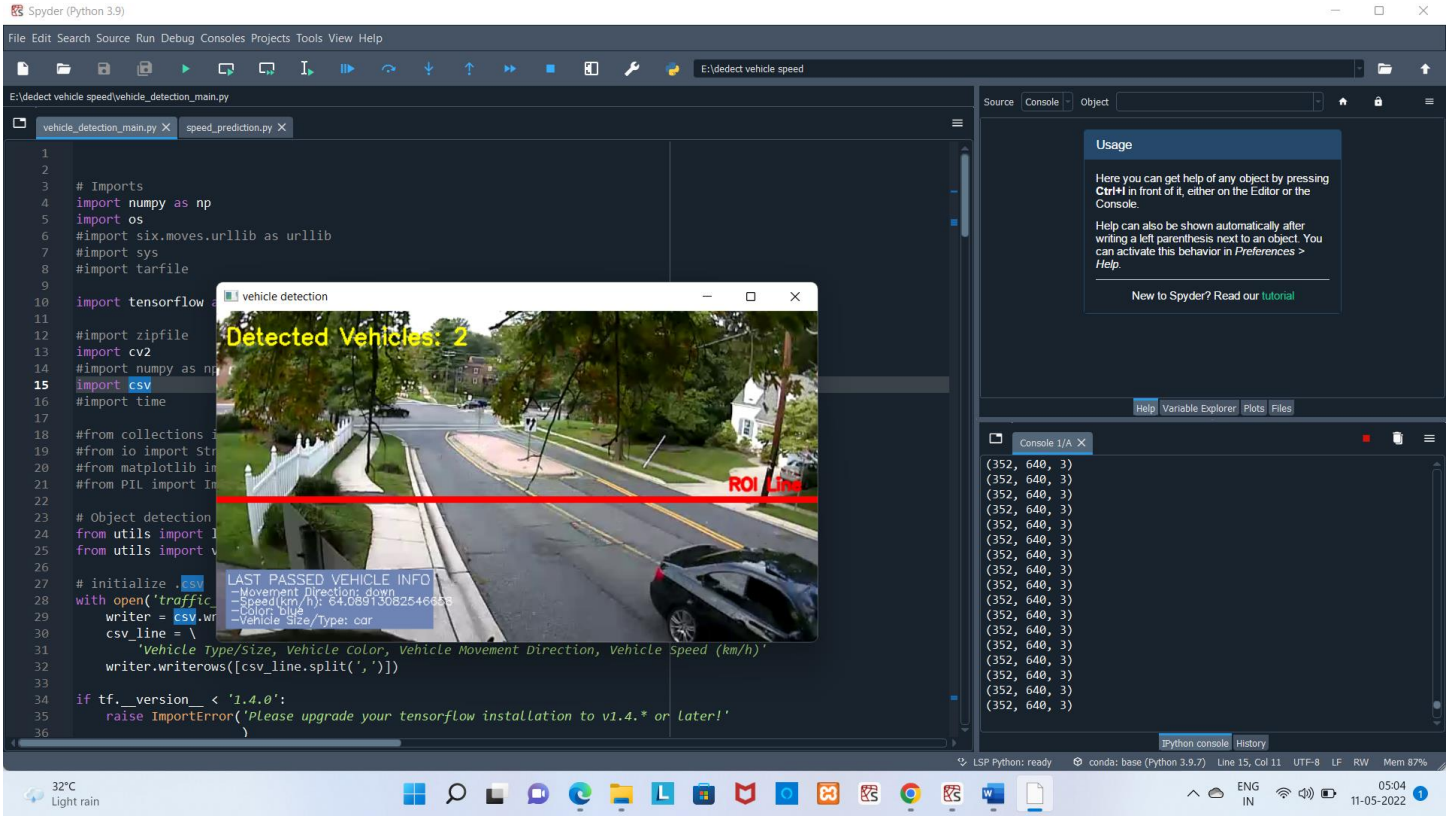
```
from utils.image_utils import image_saver
is_vehicle_detected = [0]
current_frame_number_list = [0]
bottom_position_of_detected_vehicle = [0]
def predict_speed(
    top,
    bottom,
    right,
    left,
    current_frame_number,
```

```
    crop_img,
    roi_position,
    ):
    speed = 'n.a.'  # means not available, it is just initialization
    direction = 'n.a.'  # means not available, it is just initialization
    scale_constant = 1  # manual scaling because we did not performed camera calibration
    isInROI = True  # is the object that is inside Region Of Interest
    update_csv = False
    if bottom < 250:
        scale_constant = 1  # scale_constant is used for manual scaling because we did not
performed camera calibration
    elif bottom > 250 and bottom < 320:
        scale_constant = 2  # scale_constant is used for manual scaling because we did not
performed camera calibration
    else:
        isInROI = False
    if len(bottom_position_of_detected_vehicle) != 0 and bottom \
        - bottom_position_of_detected_vehicle[0] > 0 and 205 \
< bottom_position_of_detected_vehicle[0] \
        and bottom_position_of_detected_vehicle[0] < 210 \
        and roi_position < bottom:
        is_vehicle_detected.insert(0, 1)
        update_csv = True
        image_saver.save_image(crop_img)  # save detected vehicle image
    # for debugging
```

```
    # print("bottom_position_of_detected_vehicle[0]: " +
str(bottom_position_of_detected_vehicle[0]))

    # print("bottom: " + str(bottom))

    if bottom > bottom_position_of_detected_vehicle[0]:

        direction = 'down'

    else:

        direction = 'up'

    if isInROI:

        pixel_length = bottom - bottom_position_of_detected_vehicle[0]

        scale_real_length = pixel_length * 44  # multiplied by 44 to convert pixel length to real
length in meters (chenge 44 to get length in meters for your case)

        total_time_passed = current_frame_number - current_frame_number_list[0]

        scale_real_time_passed = total_time_passed * 24  # get the elapsed total time for a vehicle
to pass through ROI area (24 = fps)

        if scale_real_time_passed != 0:

            speed = scale_real_length / scale_real_time_passed / scale_constant  # performing
manual scaling because we have not performed camera calibration

            speed = speed / 6 * 40  # use reference constant to get vehicle speed prediction in
kilometer unit

            current_frame_number_list.insert(0, current_frame_number)

            bottom_position_of_detected_vehicle.insert(0, bottom)


    return (direction, speed, is_vehicle_detected, update_csv)
```

9. SCREENSHOTS





10. CONCLUSION

The proposed system is capable of estimating the accurate speed of the moving vehicle. This system is designed using kernal algorithm Gaussian mix model was collaborated along with this algorithm for making accurate depiction of the moving objects. The combination of optical stream and the Kalman channel helps in predicting the results even when there is a low picture quality. It is concluded that the system works well and satisfies all the end-users. The proposed system is tested very well and errors are properly debugged. This system is user-friendly so everyone can use it easily. The end-user can easily understand how the whole system is implemented by going through the documentation. The system is tested, implemented and the performance is found to be satisfactory.

11. FUTURE ENHANCEMENT

In future, the proposed system will be improved by detecting speed and accuracy of various types of vehicles. The flexible heaps of pixels will be used for perceiving the speed from vertical advancements. To manage various traffic conditions such as traffic management, prevention of accident, secure transportation, We can implement this as a real time project but it will be more expensive.

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GIFT DISTRIBUTION SYSTEM

A project submitted to

ST.MARY'S COLLEGE (Autonomous), Thoothukudi.

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

In partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

R. RAMYA

Reg.No.: 20SPCS17

Under the Supervision and

Guidance of

Ms.C.Nayanthra Mascarenhas M.Sc., M.Phil., SET.,

PG DEPARTMENT OF COMPUTER SCIENCE(SSC)

St.Mary's College (Autonomous),Thoothukudi-628001

May 2022

CERTIFICATE

This is to certify that this project work entitled **"**GIFT DISTRIBUTION SYSTEM**"**is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to ManonmaniamSundaranar University, Tirunelveli, in partial fulfillment for the award of the degree of Master of Science in Computer Sciencefor the work done during the year 2020-2021 by R.RAMYA(Reg. No.20SPCS17).

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do here by declare that,the project entitled**" GIFT DISTRIBUTION SYSTEM"** submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance **of MS.C.Nayanthra Mascarenhas M.Sc.,M.Phil.,SET., Assistant Professor**,PG Department of ComputerScience(SSC),St.Mary's College(Autonomous),Thoothukudi.

Station: Thoothukudi Signature of the Student

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr.Rev. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil.,Ph.D., Principal,

Sr. Flora Mary, Secretary, Rev.Sr.Josephine Jeyarani, Director of SSC, St.Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms.C.Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and Co-odrinator,PG Computer Science(SSC),for her support and counsel.

I express my hearty thanks to my guide Ms. A. Jenitta JebamalarM.Sc (IT)., M.Sc (CS)., M.Phil., B.Ed., Assistant professor, PG Department of Computer Science (SSC),for her support and counsel. For her valuable suggestions, gentle guidance, enthusiastic ideas, to carry out and complete my work entirely.

I also express my boundless thanks to Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC),for their kind cooperation in successful completion of the project.

I am much indebted to Dr.P.Johnson DuraiRaj, Director, Postulate Infotech for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

POSTULATE

14-05-2022

To

The Head of the Department

PG Department of Computer Science (SSC)

St. Mary's College (Autonomous)

Thoothukudi

Dear Sir/Madam,

Sub: Project Completion Certificate-Reg

On behalf of **POSTULATE**, We are pleasure to inform you that **Ms. R. Ramya, Reg No: 20SPCS17** studying **Master of Computer Science** Final year has been done the project work at our concern on **"Gift Distribution System"** during the period from February 2022 to May 2022.

During this period, we noticed her to be diligent, sincere and hardworking and she accomplished her task within stipulated deadline. We wish her for all future endeavors.

POSTULATE INFO TECH Thoothukudi

PROJECT DIRECTOR

ABSTRACT

Gift Distribution System is an application that is designed to present religious gifts to a wellwisher by user .This project has user side and administration side that provide the user to create their own account in the user side of the application. All gifts will be managed by admin and user will be able to view them in the user side of the application. This project interface gives the user information and keeps track of the status according to the user's order. It helps the user to order, to create a profile for user and also for well-wisher, to track the order, to share the information. In this application, a well-wisher can also create their own profile and also add many well-wishers. This application helps the admin to manage the customer and their event, product details, purchase details and product delivery status. Using admin side, the tracking and delivery status of the gift can be monitored. This gift distribution system application helps the well-wishers and user to distribute their religious gift items.

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INTRODUCTION

The Gift Distribution System has been developed to override the problems prevailing in the practicing manual system. This software is supported to eliminate and in some cases reduce the hardships faced by this existing system .Moreover this system is designed for the particular need of the company to carry out operations in a smooth and effective manner.

The application is reduced as much as possible to avoid errors while entering the data. It also provides error message while entering invalid data. No formal knowledge is needed for the user to use this system. Thus by this all it proves it is user-friendly. Gift distribution system can lead to error free, secure, reliable and fast management system. It can assist the user to concentrate on their other activities rather to concentrate on the record keeping. Thus it will help organization in better utilization of resources.

Every organization, whether big or small, has challenges to overcome and managing the information of customer, Gift distribution, Gift, Gift type. Every Gift Distribution System has different Gift needs, therefore we design exclusive distribution systems that are adapted to the managerial requirements. This is designed to assist in strategic planning, and will help you ensure that your organization is equipped with the right level of information and details for your future goals. Also, for those busy executive who are always on the go, our systems come with remote access features, which will allow you to manage your workforce anytime, at all times. These systems will ultimately allow you to better manage resources.

The purpose of Gift Distribution System is automate the existing manual system by the help of computerized equipments and full-fledged computer software, fulfilling their requirements, so that their valuable data/information can be stored for a longer period with easy accessing and manipulation of the same. The required software are easily available and easy to work with.

Gift Distribution system, as described above, can lead to error free, secure, reliable and fast management system. It can assist the user to concentrate on their activities rather to concentrate on their activities rather to concentrate on the record keeping. Thus it will help organization in better utilization of resources. The organization can maintain computerized records without redundant entries. That means that one need not be distracted by information that is not relevant, while being able to reach the information.

The aim is to automate its existing manual system by the help of computerized equipments and full-fledged computer software, fulfilling their requirements, so that their valuable data/information can be stored for a longer period with easy accessing and manipulation of the same. Basically the project describes how to manage for good performance and better services for the clients.

The main objective of the project on Gift distribution system is to manage the details of well-wisher, Gift type, Gift delivery tracking. The project is built at both administrative and user. The purpose of the project is to build an application program to reduce the manual work for managing the gift

distribution, well-wisher information, delivery status. It tracks all the details about the Gift supply, Gift type.

SYSTEM SPECIFICATION

HARDWARE REQUIREMENTS:

Hardware support the PC with below mentioned configuration.

- Processor : Pentium –IV
- Speed : 1.1 GHz
- RAM : 512 MB (minimum)
- Hard Disk : 40 GB
- Floppy Drive : 1.44 MB

SOFTWARE REQUIREMENTS:

Software specification for the system are detailed as follows:

- OPERATING SYSTEM : Windows XP or Win7
- FRONT END : ionic/angular
- BACK END : Django
- CODING : Python
- DOCUMENTION : MS-Office 2007

Ionic

Ionic is a complete open-source SDK for hybrid mobile app development created by Max Lynch, Ben Sperry, and Adam Bradley of Drifty Co. in 2013. The original version was released in 2013 and built on top of AngularJS and Apache Cordova. However, the latest release was re-built as a set of Web Components, allowing the user to choose any user interface framework, such as Angular, React or Vue.js. It also allows the use of Ionic components with no user interface framework at all. Ionic provides tools and services for developing hybrid mobile, desktop, and progressive web apps based on modern web development technologies and practices, using Web technologies like CSS, HTML5, and Sass. In particular, mobile apps can be built with these Web technologies and then distributed through native app stores to be installed on devices by utilizing Cordova or Capacitor.

Angular

Angular (commonly referred to as "Angular 2+" or "Angular CLI") is a TypeScript-based free and open-source web application framework led by the Angular Team at Google and by a community of individuals and corporations. Angular is a complete rewrite from the same team that built AngularJS. Angular is used as the frontend of the MEAN stack, consisting of MongoDB database, Express.js web application server framework, Angular itself (or AngularJS), and Node.js server runtime environment.

Django

Django is a Python-based free and open-source web framework that follows the model–template–views (MTV) architectural pattern. It is maintained by the Django Software Foundation (DSF), an independent organization established in the US as a 501(c)(3) non-profit. Django's primary goal is to ease the creation of complex, database-driven websites. The framework emphasizes reusability and "pluggability" of components, less code, low coupling, rapid development, and the principle of don't repeat yourself. Python is used throughout, even for settings, files, and data models. Django also provides an optional administrative create, read, update and delete interface that is generated dynamically through introspection and configured via admin models. Some well-known sites that use Django include Instagram,Mozilla, Disqus, Bitbucket, Nextdoor and Clubhouse.

PROJECT DESCRIPTION

Gift Distribution System is a web-application app developed using Ionic/Angular as front end and Django as a back end. The purpose of the system is to present the religious based gifts. The user creates a profile for him/her and creates a well wishers under their profile. The user can order the gift for the well wishers for the selected event. The order status can be tracked. The user adds a events for the well wishers. Admin has four master page (Event, Religion, Product master, Product Group). Admin can view the User list which redirect to view users profile and well wishers for the appropriate user while selecting it.By Selecting each well wishers will redirect us to view the well wisher profile and their respective events. The admin can view the list of orders and update the status of the order.

MODULE DESCRIPTION

HOME PAGES

The user can visit the home page using a website l598ink provided by the organization. In this home page, user can get the information about the organization using the about us tab and they can also contact them using contact us. Sign in and signup can help the users to join the organization.

- HOME
- ABOUT US
- OFFERINGS
- CONTACT US
- SIGN IN
- SIGN UP

ABOUT US

This contains the information about the service provided by the company.

OFFERINGS

This module contains the products offered by the company.

CONTACT US

This module contains the contact details of the company.

SIGNIN PAGE

In signin page, user can enter their profile using their registered phone number and password. After the validation process user will get the login successful popup notification.

SIGNUP PAGE

The user can create a new account using this sign up page. For creating a new account, user should enter their personal details like name, gender, phone no and their own password. Once the details are saved

An OTP will be sent to their registered phone number, using that OTP user can create their own account or else they can reset it.

USER SIDE

The user side contains 5 modules:

- Home
- Profile
- WellWishers
- WellWishers Order
- Logout

PROFILE

In profile user can view their profile, they can edit their details using edit profile. They can reset password and save the profile. User can view their already added well wishers details. They can add new well wishers like friends, colleagues.

WELLWISHERS

List of all the well wishers will be displayed in this page. By clicking specific wellwisher, The user can view the wellwishers details, event details and can also be updated. Then user can choose the event, Event date, Event description. Add button will save the entered details. By clicking Add Well Wisher, User will be redirect to Add Well Wisher page to add new well wisher.

WELLWISHERS ORDER

List of all the well wishers will be displayed in this page . By clicking specific wellwisher, The user can view the wellwishers event order page. The input for the orders will be updated by the user and the order will be placed. Already ordered list will be displayed. By clicking specific order, the page will be redirect to order track page where the order status will be viewed.

LOGOUT

By using log out, the user will be navigated to the home page.

ADMIN SIDE

The admin side contains 8 modules:

- Home
- User
- Event
- Religion
- Product Group
- Product Master
- Ordered List
- LogouT

USER

List of all the users will be displayed in this page. By clicking specific user, The user will be redirect to userprofile page where the user profile details will be displaced and the well wishers under the selected user will be displaced in table format, By clicking view icon in table, The user will be redirect to well wisherprofile page where the well wisherprofile details will be displaced and the events under the selected well wisher will be displaced in table format.

EVENT

This is the master page, Events provided by the company will be added and can be updated here.

RELIGION

This is the master page, Religions provided by the company will be added and can be updated here.

PRODUCT GROUP

This is the master page, Product Groups (Eg: Holy Cards) provided by the company will be added and can be updated here.

PRODUCT MASTER

This is the master page, Products (Eg: Christmas Cards) provided by the company will be added and can be updated here.

ORDERED LIST

List of Orders placed by the users will be displayed here in table format. Status of the order (Eg: InProcessing, Delivered) will be updated by choosing the status level provided in the appropriate select box. The default ordered status before updation process will be ordered. The user will receive status ordered while tracking the order.

LOGOUT

By using log out, the user will be navigated to the home page

SYSTEM STUDY

EXISTING SYSTEM

- The purpose of the existing system is to provide service for the customers to order gifts through online for home delivery or pick up from shop.
- The gifts such as clothes, fancy items, Electrical Appliances etc. can only be ordered for our own purpose.
- There is no provision for ordering the gift and delivered it directly to the receiver surprisingly.
- There is no provision for ordering and presenting the religions based gift.

PROPOSED SYSTEM

- The purpose of the proposed system is to provide the service to the customer by providing religious based gift to be ordered and delivered directly it to the receiver.
- The specific user (Eg: Company) can make a profile for themselves, and can add many well wishers under them (Eg: Employees).
- User can send the gift for any occasion to the well wishers directly.
- The payment for the order will be payed only by the user.

SYSTEM ANALYSIS

FEASIBILITY STUDY

The feasibility study of our proposed system can be analyzed in this section. In this system, it analyzes how the project objectives can be achieved successfully, accounting for internal and external influences that affect the project such as economic, technological, legal and time factors.

For this project, the factors considered include the following:

- How much investment is required for the development process?
- Are the skills required for developing this system?
- Is this system is technically provable?
- Will the final outcome of our proposed system be useful or usable?
- Will the proposed system is useful for major participants in the market?

TECHNICAL FEASIBILITY

In this technical feasibility study, conducted a study whether the technical assumptions of this proposed system is provable, whether the technical requirements and milestones of the system can be achievable with the resources available. In this study, the quality and quantity of the developers or designers are also studied to make the proposed system and to check both the development productivity and the skills of the programmers are enough sufficient for the development of the required proposed system.

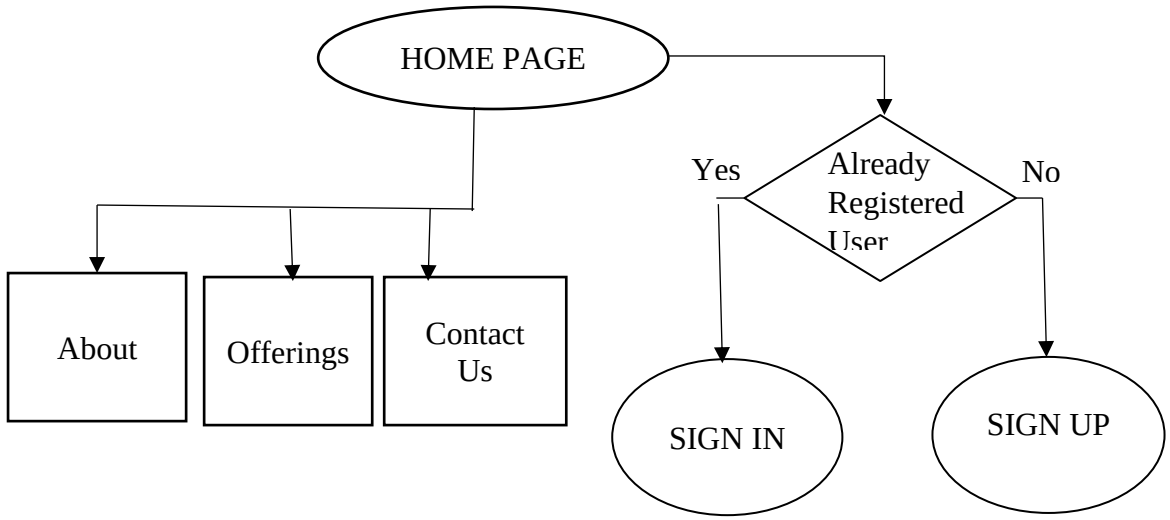
ECONOMIC FEASIBILITY

In this economic feasibility study, conducted a study based on the cost or financially benefit analysis of the required project. Economic feasibility study had performed as follows:

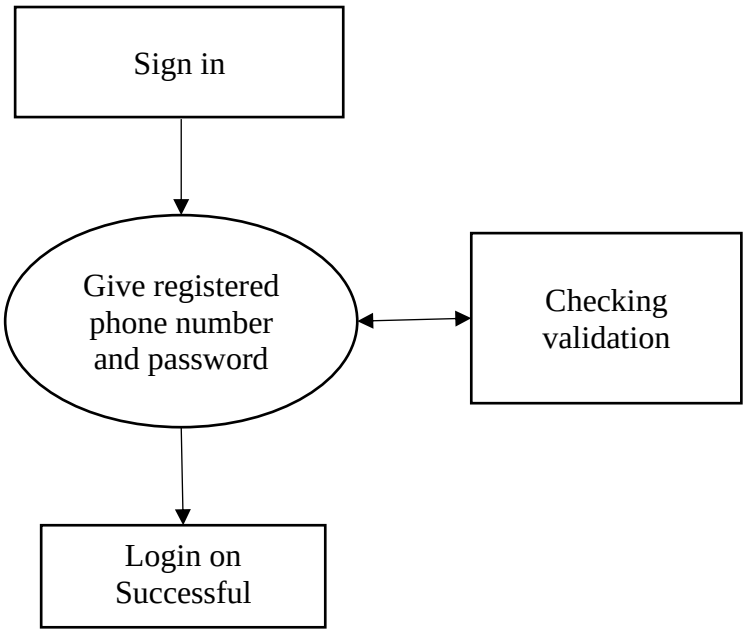
- How much capital and financial investment are available?
    - Software and hardware tools required for this project are free and open source. So, no capital investment is required. Need minimum financial requirements for internet subscriptions and these costs can be covered by the researcher.
    - The developer does not have the required skill, Traning Period for 19 days was taken for the study of the Ionic/Angular and Django Framework. After the traning period, developer got the minimum skill to develop this application.
- How the project outcome is profitable?
    - The purpose of the proposed system is to provide the service to the customer by providing religious based gift to be ordered and delivered directly it to the receiver.

SYSTEM DESIGN

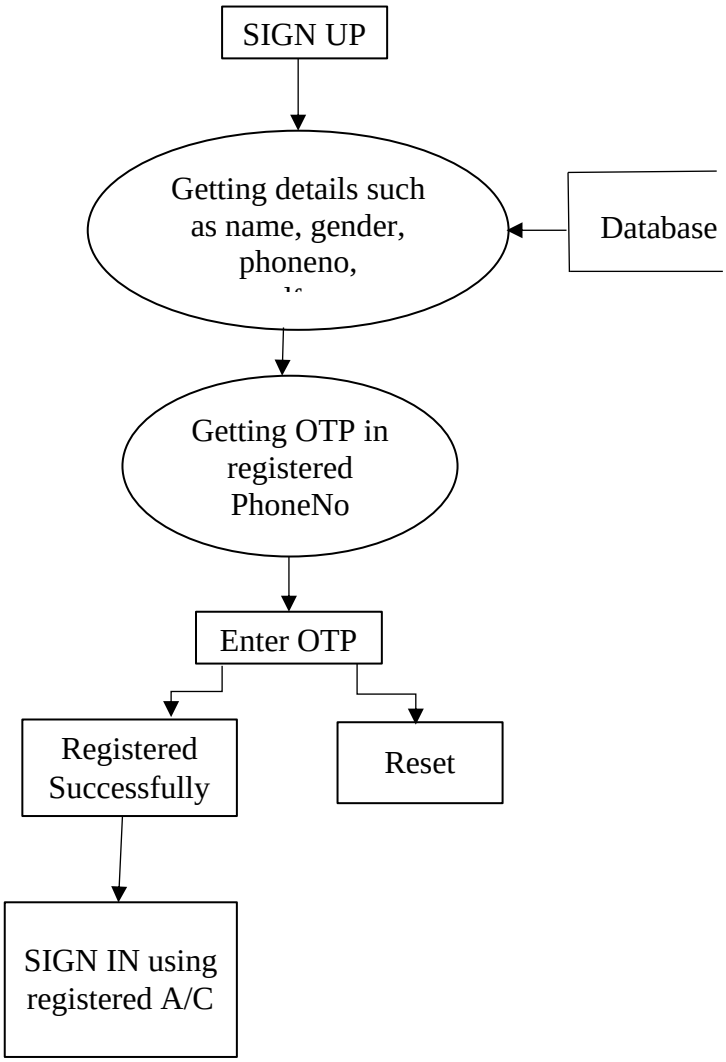
HOME PAGES



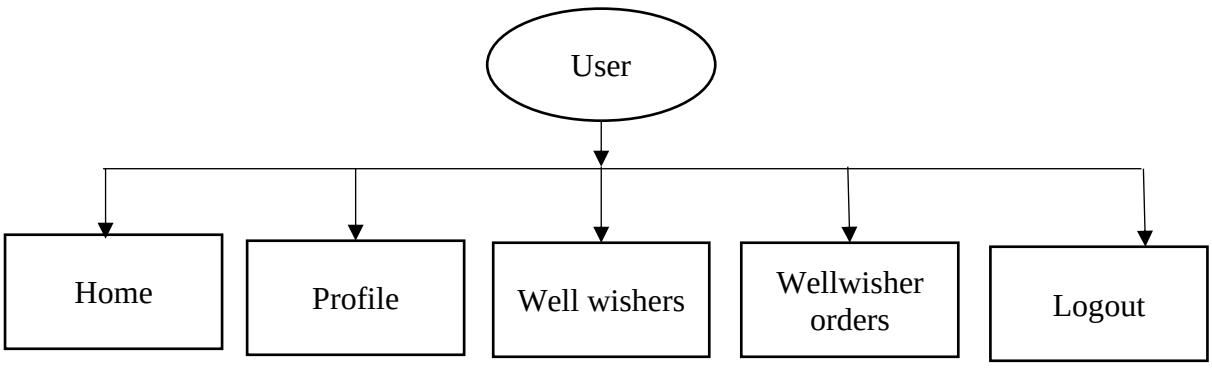
SIGNIN



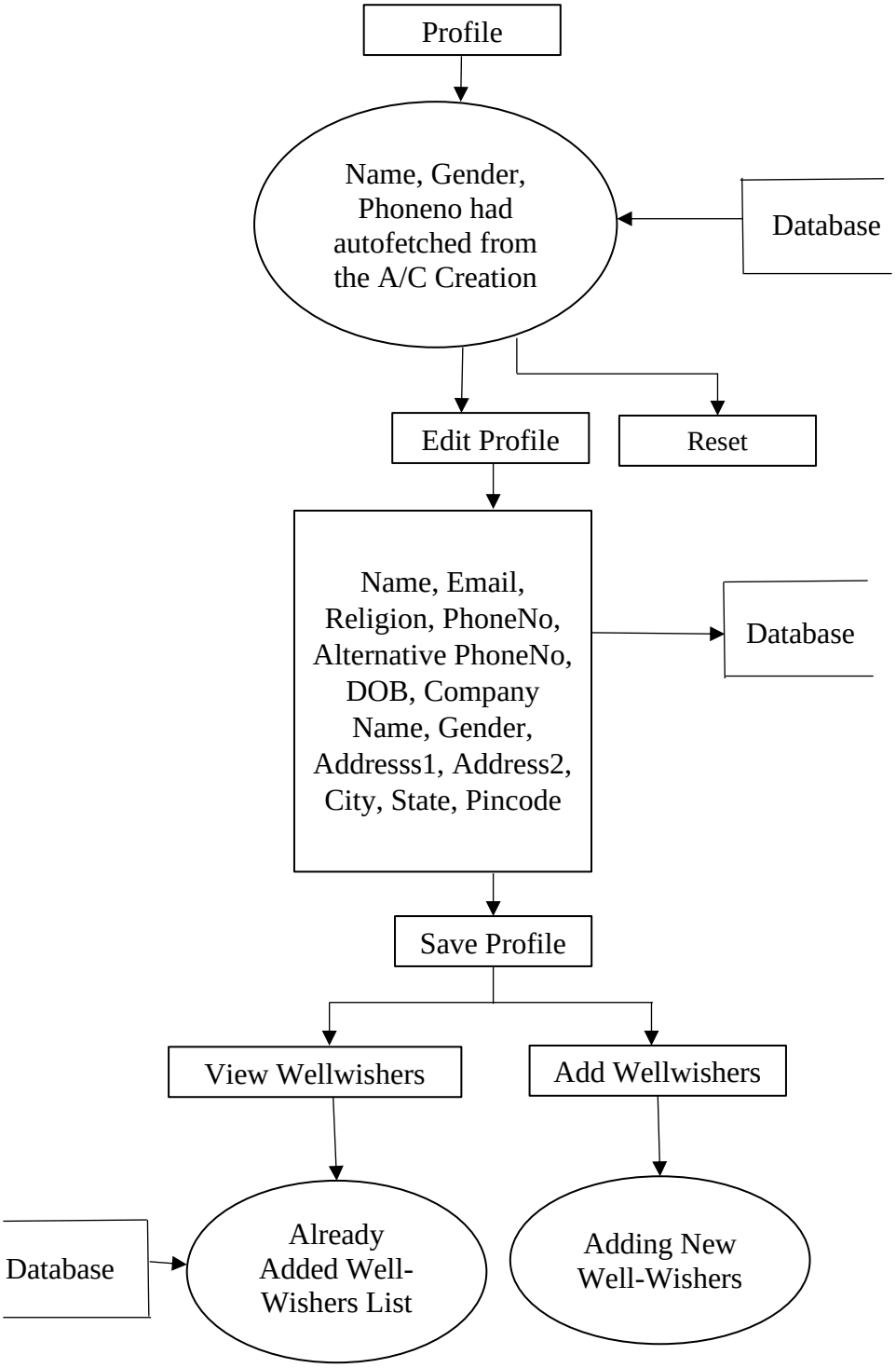
SIGN UP



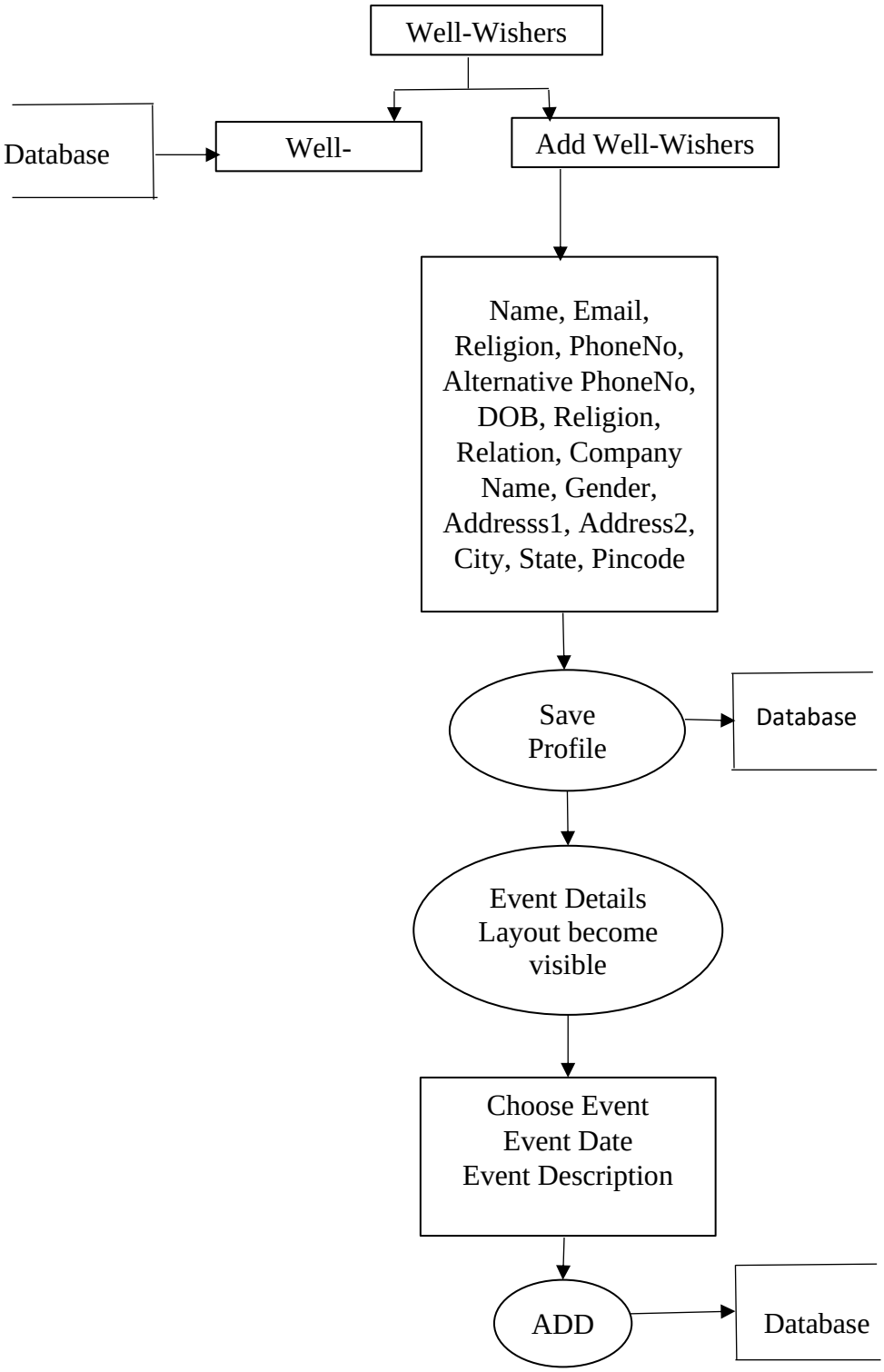
USER LOGIN



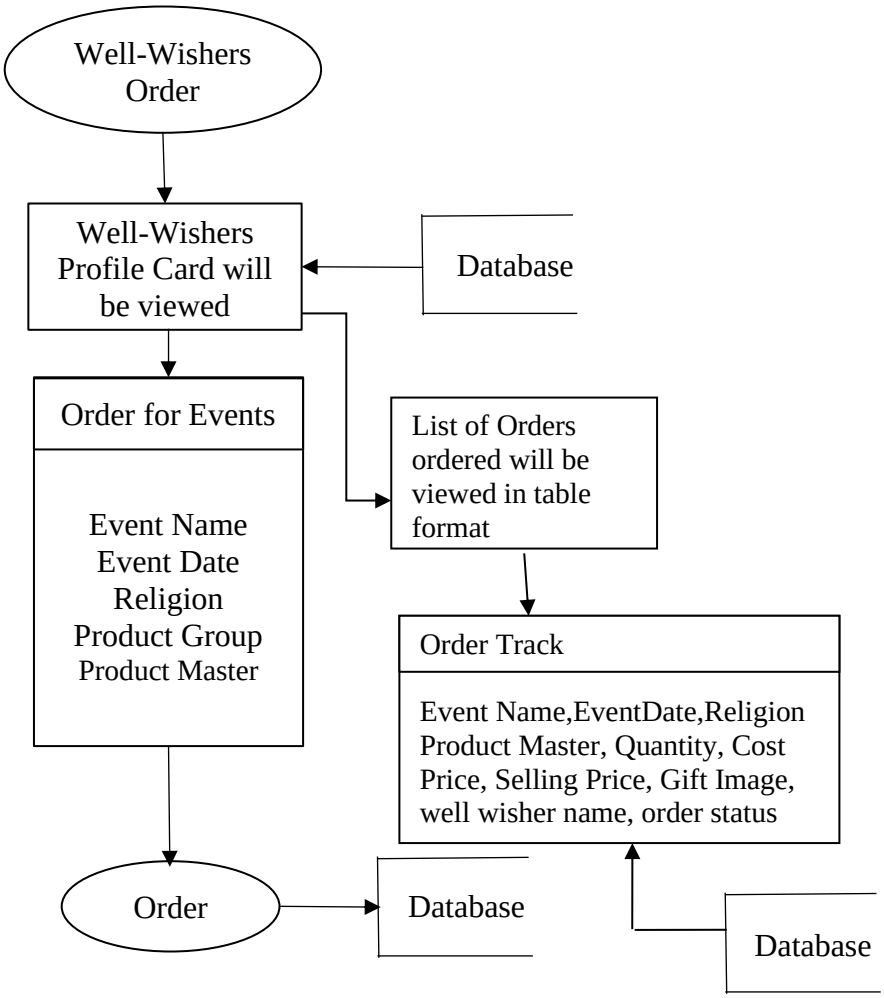
PROFILE


Profile
Name, Gender, Phoneno had autofetched from the A/C Creation
Database
Edit Profile
Reset
Name, Email, Religion, PhoneNo, Alternative PhoneNo, DOB, Company Name, Gender, Addresss1, Address2, City, State, Pincode
Database
Save Profile
View Wellwishers
Add Wellwishers
Database
Already Added Well-Wishers List
Adding New Well-Wishers

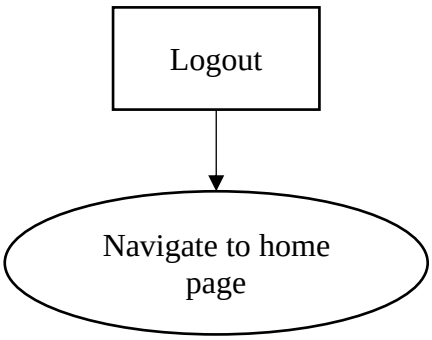
WELLWISHERS



WELLWISHER ORDER

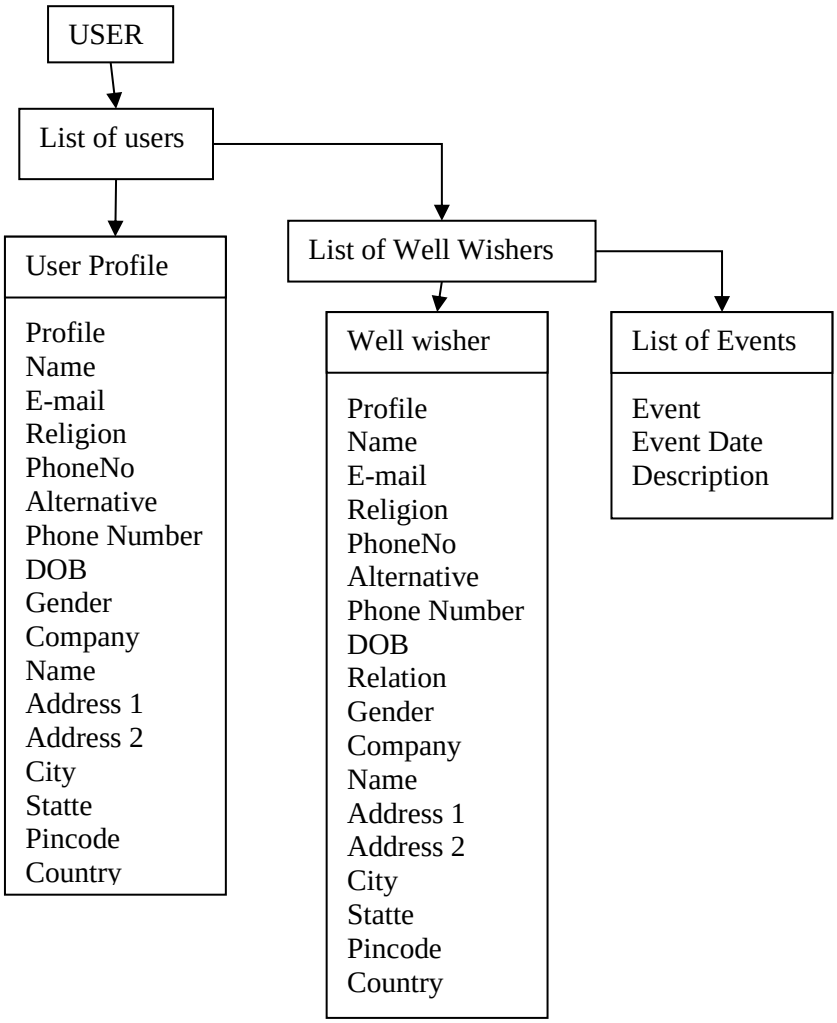


LOGOUT

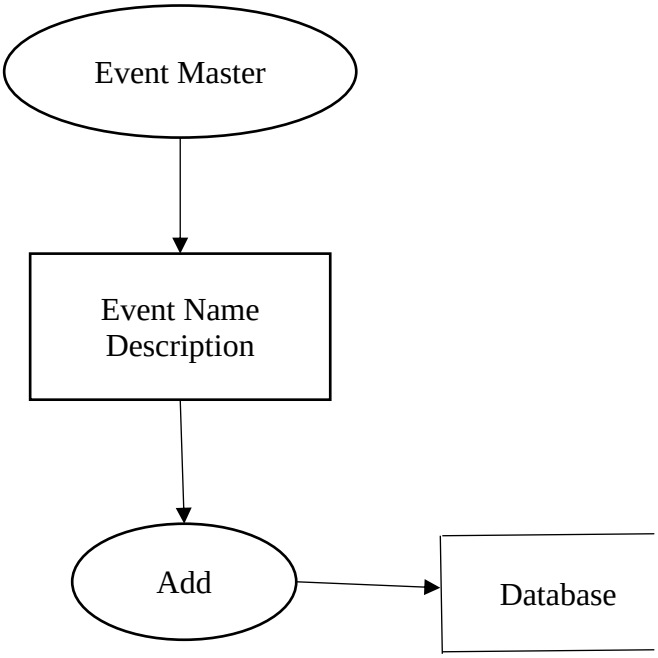


ADMIN PAGE

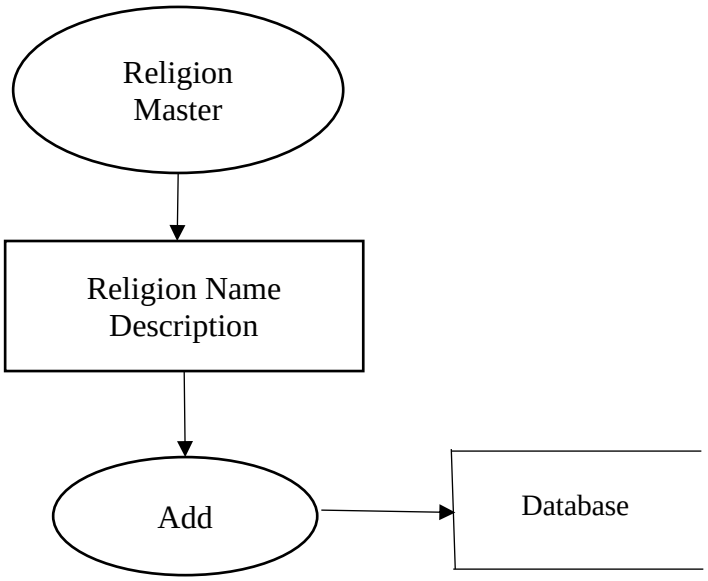
USER



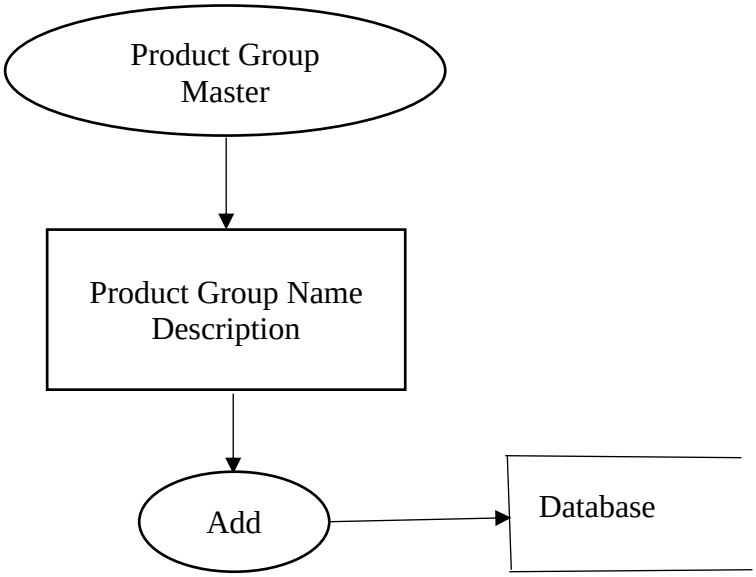
EVENT PAGE



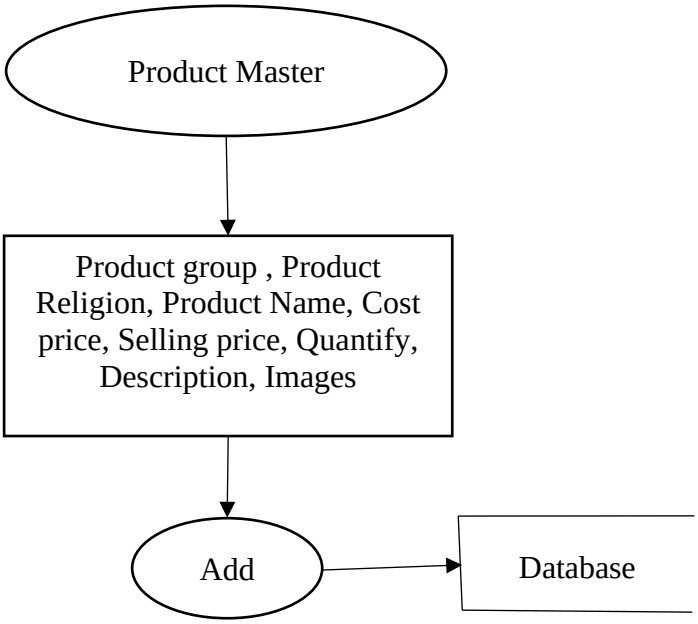
RELIGIONPAGE



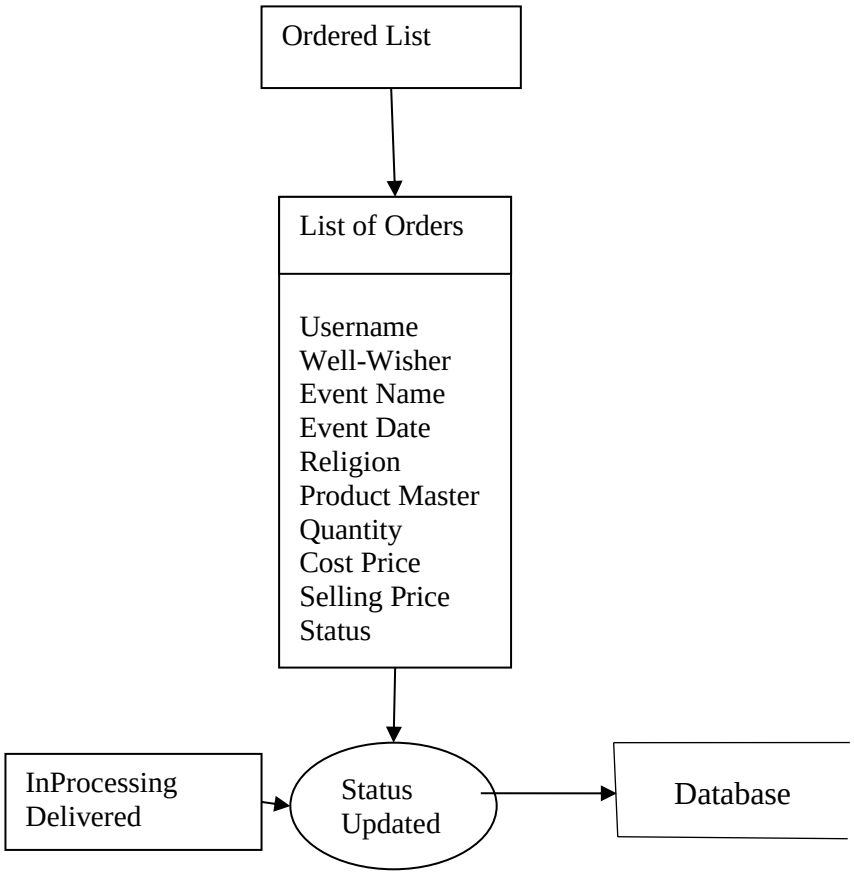
PRODUCT GROUP NAME



PRODUCT MASTER



Ordered List



DATABASE DESCRIPTION

Table: User_Creation

Column	Type	Null	Default
user_id	int(11)	No	
Name	varchar(100)	No	
sur_name	varchar(100)	No	
Gender	varchar(50)	No	
Password	varchar(50)	No	
Email	varchar(50)	No	
company_name	varchar(200)	No	
Number	varchar(50)	No	
country_code1	varchar(50)	No	
number2	varchar(50)	No	
country_code2	varchar(50)	No	
address1	varchar(700)	No	
address2	varchar(700)	No	
City	varchar(150)	No	
State	varchar(150)	No	
Pincode	varchar(150)	No	
Country	varchar(150)	No	
birth_date	date	Yes	NULL
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
Delflag	varchar(3)	No	
user_type	varchar(3)	No	
religion_id	int(11)	Yes	NULL

Table: profile_image

Column	Type	Null	Default
photo_id	int(11)	No	
image_path	varchar(600)	No	
user_id	int(11)	Yes	NULL

Table: well_wishers

Column	Type	Null	Default
ww_id	int(11)	No	
ww_name	varchar(100)	No	
ww_sur_name	varchar(100)	Yes	NULL
ww_c_code1	varchar(50)	No	
ww_email	varchar(100)	Yes	NULL
ww_relation	varchar(100)	Yes	NULL
ww_profile	longtext	Yes	NULL
ww_company_name	varchar(100)	Yes	NULL
ww_gender	varchar(100)	Yes	NULL
ww_dob	date	Yes	NULL
ww_phone_no1	varchar(15)	No	
ww_c_code2	varchar(50)	No	
ww_phone_no2	varchar(15)	No	
ww_address1	varchar(700)	No	
ww_address2	varchar(700)	No	
ww_city	varchar(150)	No	
ww_state	varchar(150)	No	
ww_pincode	varchar(150)	No	
ww_country	varchar(150)	No	
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
Delflag	varchar(3)	No	
user_id	int(11)	Yes	NULL
ww_religion_id	int(11)	Yes	NULL

Table: ww_events

Column	Type	Null	Default
wwe_id	int(11)	No	
event_date	Date	Yes	NULL
description	varchar(600)	No	
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
delflag	varchar(3)	No	
event_id	int(11)	Yes	NULL
user_id	int(11)	Yes	NULL
ww_id	int(11)	Yes	NULL

Table: order_well_wisher_event

Column	Type	Null	Default
ord_wwe_id	int(11)	No	
ord_product_cost_price	varchar(600)	No	
ord_product_sell_price	varchar(600)	No	
ord_product_quantity	varchar(600)	No	
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
Delflag	varchar(3)	No	
ord_product_group_id	int(11)	Yes	NULL
ord_product_master_id	int(11)	Yes	NULL
ord_religion_id	int(11)	Yes	NULL
wwe_id	int(11)	Yes	NULL
Status	varchar(600)	No	

Table: country

Column	Type	Null	Default
Id	int(11)	No	
name	varchar(100)	No	
Iso	varchar(100)	No	
nicename	varchar(100)	No	
iso3	varchar(100)	No	
numcode	varchar(100)	No	
phonecode	varchar(100)	No	

Table: event_master

Column	Type	Null	Default
event_id	int(11)	No	
event_name	varchar(100)	No	
description	varchar(600)	No	
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
delflag	varchar(3)	No	

Table: religion_master

Column	Type	Null	Default
religion_id	int(11)	No	
religion_name	varchar(100)	No	
Description	varchar(600)	No	
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
Delflag	varchar(3)	No	

Table: product_master

Column	Type	Null	Default
pm_id	int(11)	No	
pm_name	varchar(600)	No	
pm_description	varchar(600)	No	
pm_cost_price	varchar(600)	No	
pm_selling_price	varchar(600)	No	
pm_quantity	varchar(600)	No	
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
Delflag	varchar(3)	No	
pm_group_id	int(11)	Yes	NULL
religion_id	int(11)	Yes	NULL

Table: product_group

Column	Type	Null	Default
pg_id	int(11)	No	
pg_name	varchar(600)	No	
pg_description	varchar(600)	No	
create_date	datetime(6)	Yes	NULL
update_date	datetime(6)	Yes	NULL
delete_date	datetime(6)	Yes	NULL
Delflag	varchar(3)	No	

CODING

```
<ion-header>

<section class="ftco-section">

<div class="container container_nav">

<nav class="navbar navbar-expand-lg ftco_navbarftco-navbar-light" id="ftco-navbar">

<div class="container container_nav">

<div class="">

<!-- <imgsrc="../assets/images/logo3.png" style="width:70px;height:50px;float:left;">  -->

<h3>PRAY FOR YOU</h3>

</div>

<!-- <button class="navbar-toggler" type="button" data-toggle="collapse" data-target="#ftco-nav" aria-controls="ftco-nav" aria-expanded="false" aria-label="Toggle navigation">

<span class="fa fa-bars"></span> Menu

</button> -->

<div class="collapse navbar-collapse" id="ftco-nav">

<ul class="navbar-nav ml-auto mr-md-3">

<li class="nav-item"><a  href="javascript:void(0);"  [routerLink]="['home']" class="nav-link">Home</a></li>

<li class="nav-item active"><a href="javascript:void(0);"  [routerLink]="['viewprofile']" routerLinkActive="active" class="nav-link">Profile</a></li>

<li class="nav-item"><a  href="javascript:void(0);" class="nav-link"  [routerLink]="['wellwishers']" routerLinkActive="active">Wellwishers</a></li>

<li class="nav-item"><a  href="javascript:void(0);" class="nav-link" [routerLink]="['wellwishersorder']" routerLinkActive="active">Wellwishers Order</a></li>

<li class="nav-item"><a  href="javascript:void(0);" class="nav-link" (click)="usv.logout()">Logout</a></li>
```

```
</ul>

</div>

<!-- For Mobile View Navbar -->

<ion-button  class="navbar-toggler" color="dark" (click)="presentPopover($event)" id="pop_button" fill="clear" slot="end"><ion-icon name="ellipsis-vertical-outline"></ion-icon></ion-button>

</div>

</nav>

</div>

</section>

</ion-header>

<!-- Nested Popover -->

<ion-content>

<header class="masthead  text-white text-center">

<div class="container_con d-flex align-items-center flex-column" style="background-color:#488d1c;border-radius: 15px;margin-top: -10%;">

<!-- Masthead Avatar Image-->

<img class="masthead-avatar mb-5" src="assets/images/logo3.png" alt="..." />

<!-- Masthead Heading-->

<h5 class="masthead-heading text-uppercase mb-4" style="color: white;">WELCOME TO </h5>

<h1 class="masthead-heading text-uppercase mb-0 p-2" style="color: #488d1c;background-color:white;">PRAY FOR YOU</h1>

<!-- Icon Divider-->

<div class="divider-custom divider-light">

<div class="divider-custom-line"></div>

<div class="divider-custom-icon"><i class="fas fa-star"></i></div>

<div class="divider-custom-line"></div>

</div>
```

<!-- Masthead Subheading-->

<!-- <p class="masthead-subheading font-weight-light mb-0">Graphic Artist - Web Designer - Illustrator</p> -->

</header>

</ion-content>

Viewprofile.html

<ion-header>

<app-menu></app-menu>

</ion-header>

<ion-content>

<main class="content">

<h3 class="form-title">PROFILE DETAILS</h3>

<img class=" " style="width:100%;height:100%;" [src]="usv.profile_image">

<!--

{{ usv.user_details.name }}

 {{ usv.user_details.number }} -->

```
<div class="form">

<div class="row mb-2 mt-2">

<div class="col-6">

<input type="submit" [routerLink]="['../editprofile']" id="fsubmit"  value="Edit Profile  "
style="background-color:#488d1c !important;color: white;padding:0px;" class="button">

</div>

<!-- <div class="col-1"></div> -->

<div class="col-6">

<input type="submit"  [routerLink]="['/forgetpassword']" routerLinkActive="active" id="fsubmit"
value="Reset Password" style="background-color:#488d1c !important;color: white;padding:0px;"
class="button">

</div>

</div>

<div class="div">

<label for="fallday" class="label">Name</label><i style="color:red;">*</i>

<input type="text" [(ngModel)]="usv.user_details.name" class="inpt" >

</div>

<div class="div">

<label for="fallday" class="label">Email</label><i style="color:red;">*</i>

<input type="text" [(ngModel)]="usv.user_details.email" class="inpt"  >

</div>

<div class="div">

<label for="fallday" class="label">Religion</label><i style="color:red;">*</i>

<input type="text"  class="inpt" [(ngModel)]="usv.user_details.religion"  >

</div>

<div class="div">

<label for="fallday" class="label">Phone Number</label><i style="color:red;">*</i>
```

<input type="text" class="inpt" [(ngModel)]="usv.user_details.country_code1 + ' '+usv.user_details.number" >

<label for="fallday" class="label">Alternate Number</label>*

<input type="text" class="inpt" [(ngModel)]="usv.user_details.country_code2 + ' '+usv.user_details.number2" >

<label for="fallday" class="label">DOB</label>*

<input type="text" [(ngModel)]="usv.user_details.birth_date" class="inpt" >

<label for="fallday" class="label">Company Name</label>

<input type="text" class="inpt" [(ngModel)]="usv.user_details.company_name" >

<label for="fallday" class="label">Gender</label>*

<input type="text" class="inpt" [(ngModel)]="usv.user_details.gender" >

<label for="fallday" class="label">Address Line 1</label>*

<input type="text" [(ngModel)]="usv.user_details.address1" class="inpt" >

<label for="fallday" class="label">Address Line 2</label>

<input type="text" [(ngModel)]="usv.user_details.address2" class="inpt" >

```
</div>

<div class="div">

<label for="fallday" class="label">City</label><i style="color:red;">*</i>

<input type="text"   [(ngModel)]="usv.user_details.city" class="inpt" >

</div>

<div class="div">

<label for="fallday" class="label">State</label><i style="color:red;">*</i>

<input type="text"  [(ngModel)]="usv.user_details.state" class="inpt" >

</div>

<div class="div">

<label for="fallday" class="label">Pincode</label><i style="color:red;">*</i>

<input type="text"  [(ngModel)]="usv.user_details.pincode" class="inpt" >

</div>

<div class="div">

<label for="fallday" class="label">Country</label><i style="color:red;">*</i>

<input type="text" [(ngModel)]="usv.user_details.country"  class="inpt" >

</div>

<div class="row">

<div class="col-6">

<input type="submit"  [routerLink]="['../wellwishers']" id="fsubmit"  value="View Wellwishers"
style="background-color:#488d1c !important;color: white;padding:0px;" class="button">

</div>

<div class="col-6">

<input type="submit" [routerLink]="['../wellwishersprofile']" id="fsubmit"  value="Add Wellwishers"
style="background-color:#488d1c !important;color: white;padding:0px;" class="button">

</div></div></div></div></div></main></div>
```

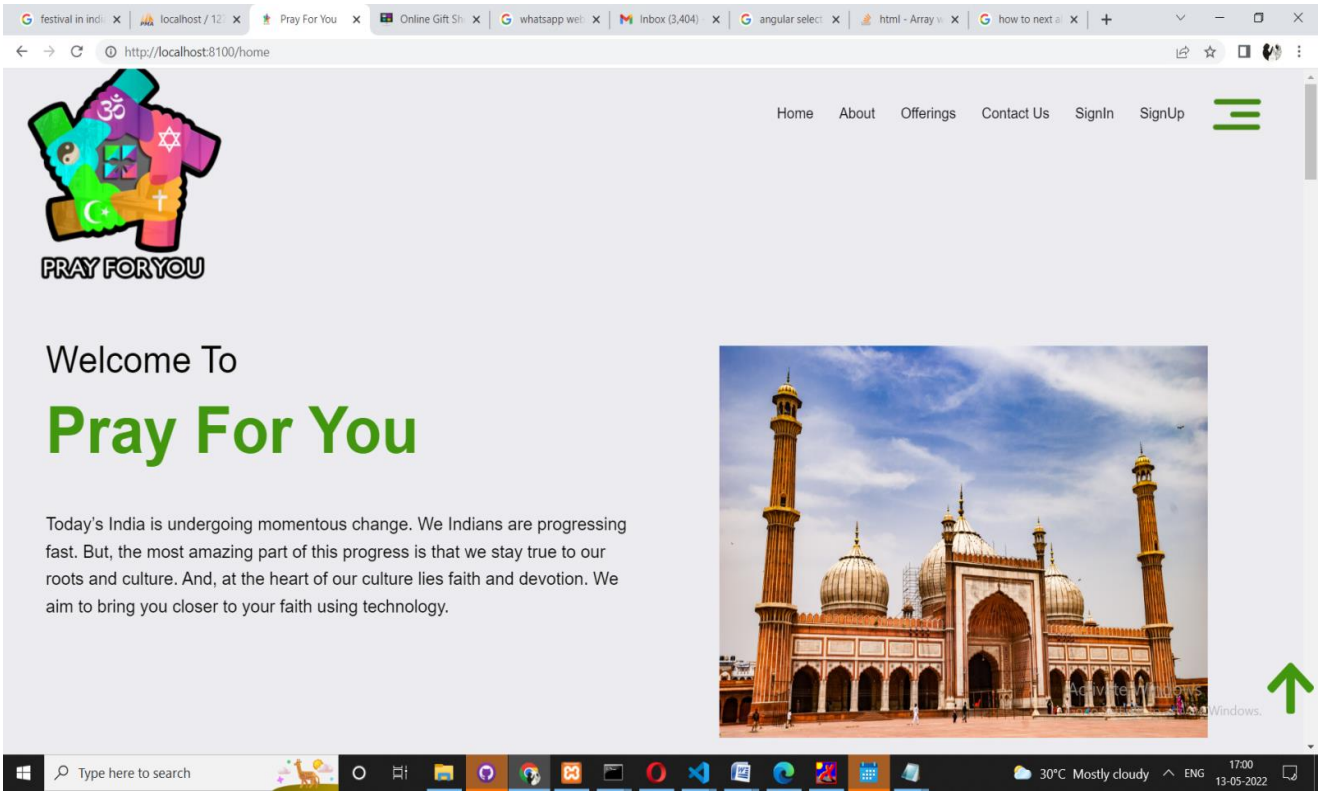
```
<!-- /=========================================================================
-->

<div class="container">

<div class="messaging">

<div class="inbox_people" >

<div class="headind_srch">

<div class="recent_heading">

<h4><b>My Events</b></h4>

</div>

<div class="srch_bar">

<div class="stylish-input-group">

<input type="text" class="search-bar"  placeholder="Search" >

<span class="input-group-addon">

<button type="button"><i class="fa fa-search" aria-hidden="true"></i></button>

</span></div>

</div>

</div>

<div class="chart_scroll_div">

<div class="inbox_chat" (click)="view_ww(i)" *ngFor="let event of usv.event_details;leti = index" >

<div class="chat_listactive_chat" *ngIf="usv.event_details.length != 0">

<div class="chat_people">

<div class="chat_img">

<h5> {{ event.event_name }}<span class="chat_date"><ion-icon name="arrow-dropright"></ion-
icon></span></h5>

<!-- <img class="" style="width:150px;height:150px;border-radius:20px;object-fit:cover"
[src]="usv.profile_image" alt="event.name"> -->

</div>
```

```
<div class="chat_ib">

<!-- <h5>Event Date : {{ event.event_date }} </h5> -->

<h5>{{ event.description }}</h5>

</div>

<div class="chat_symbol">

<h5><i class="bi bi-arrow-right-circle-fill fa-lg arrow"></i></h5>

</div></div></div></div></div>

<div class="inbox_chat">

<div class="chat_listactive_chat" *ngIf="usv.event_details.length == 0">

<div class="chat_people">

<p style="text-align:center">No Events Added.....</p>

</div></div></div></div></div></div>

</ion-content>
```

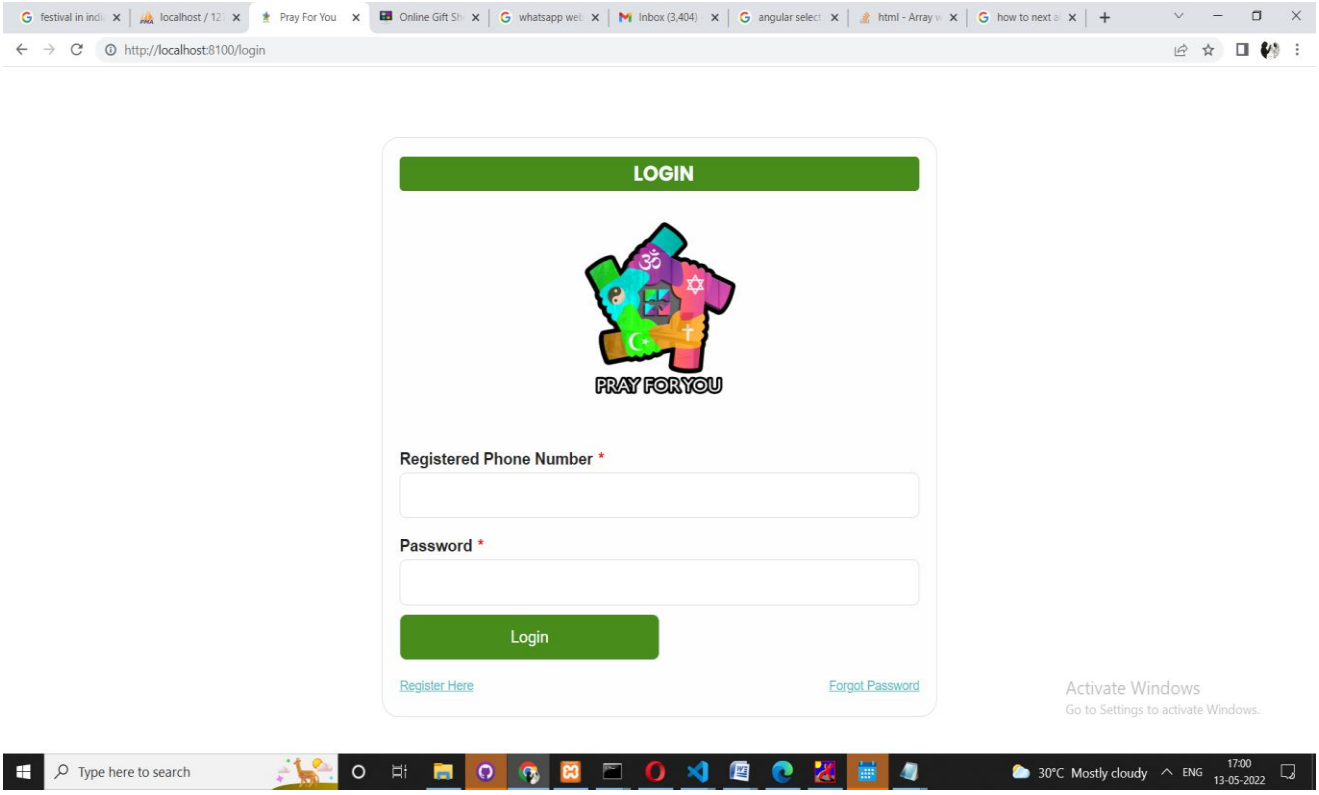
SCREENSHOTS

ADMIN SIDE:

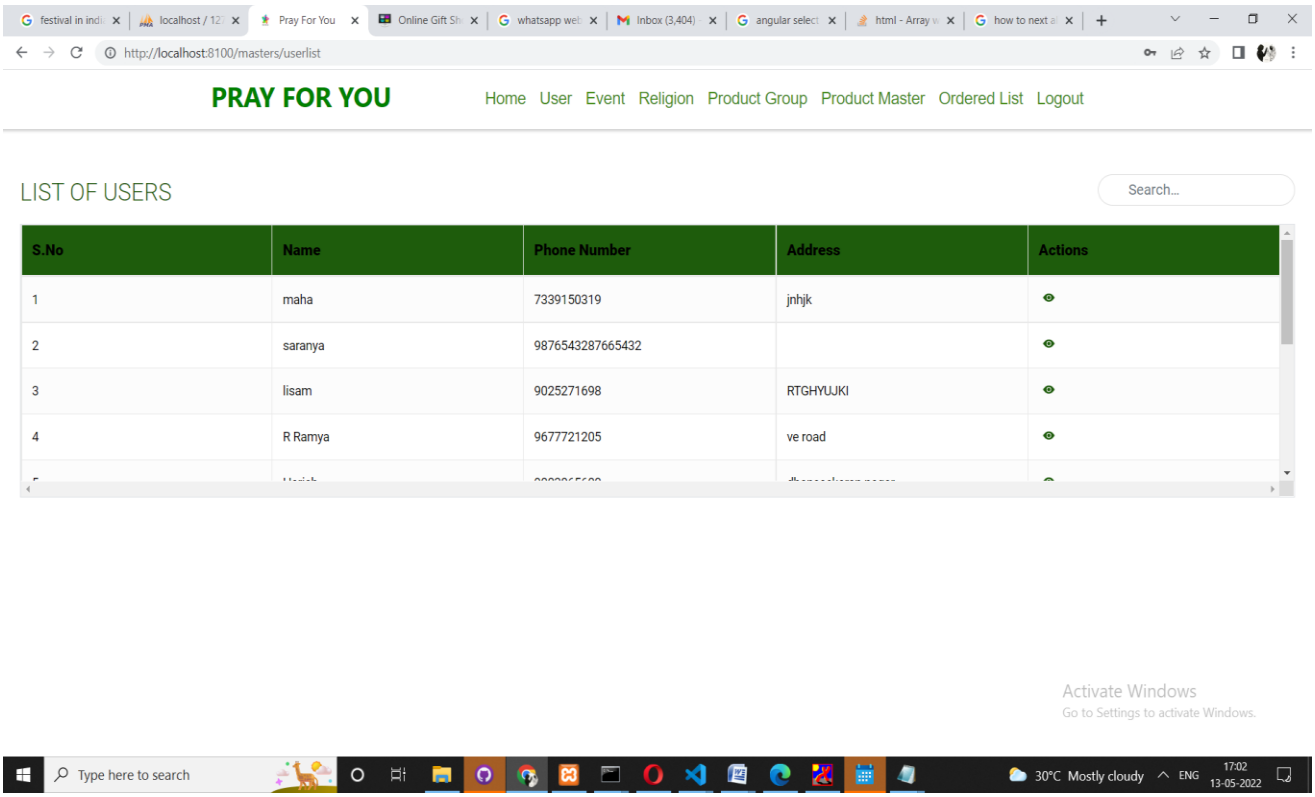
HOME SCREEN:



SIGNIN



USER:


http://localhost:8100/masters/userlist
PRAY FOR YOU
Home User Event Religion Product Group Product Master Ordered List Logout
LIST OF USERS
Search...
S.No Name Phone Number Address Actions
1 maha 7339150319 jnhjk
2 saranya 9876543287665432
3 lisam 9025271698 RTGHYUJKI
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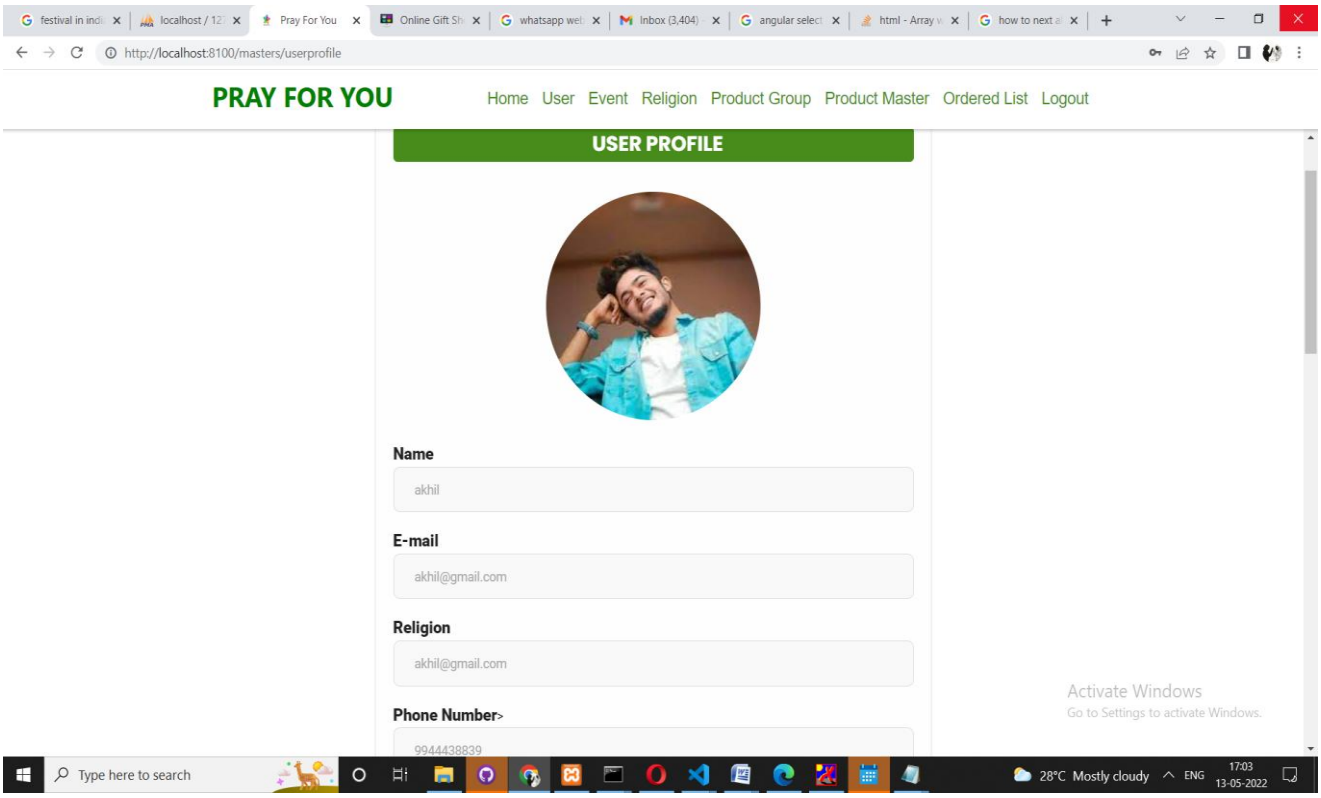
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Home User Event Religion Product Group Product Master Ordered List Logout
USER PROFILE
Name
akhil
E-mail
akhil@gmail.com
Religion
akhil@gmail.com
Phone Number>
9944438839
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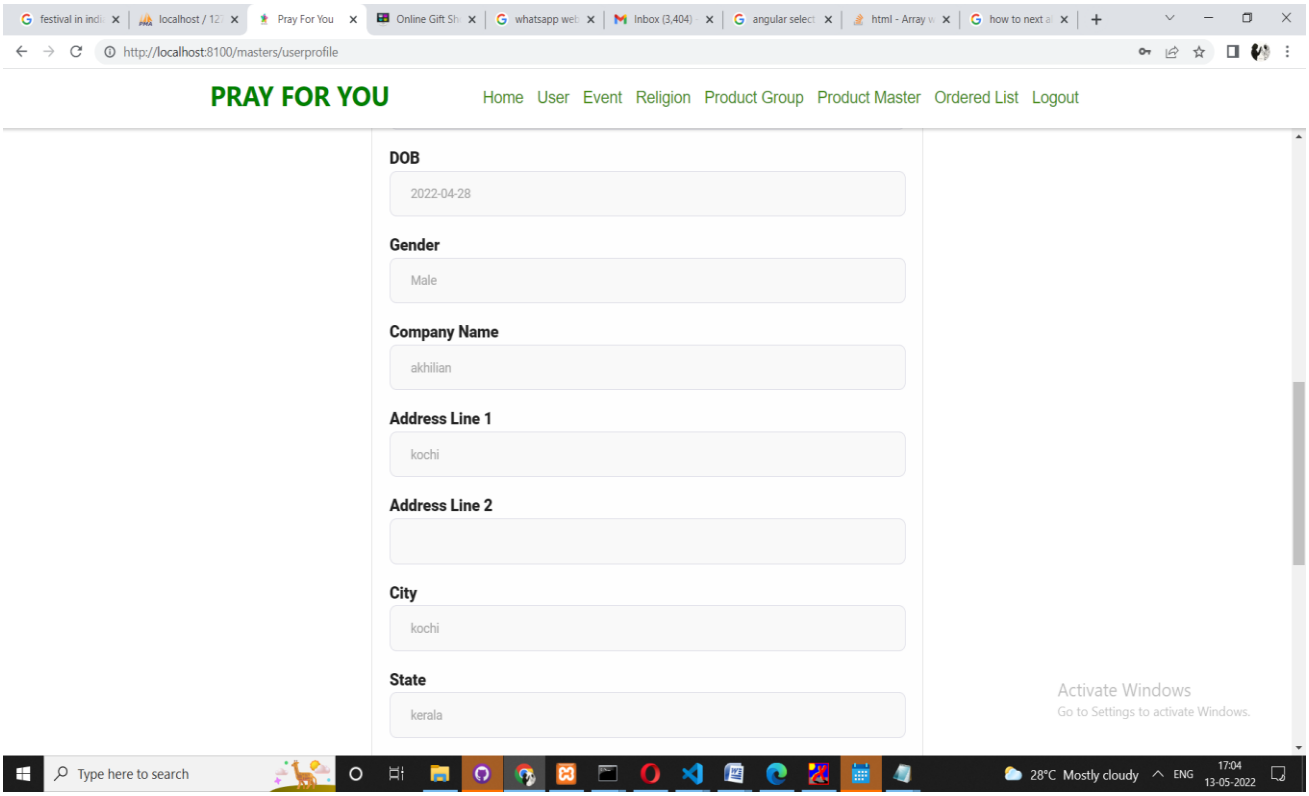
PRAY FOR YOU
Home User Event Religion Product Group Product Master Ordered List Logout
DOB
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Address Line 1
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City
kochi
State
kerala
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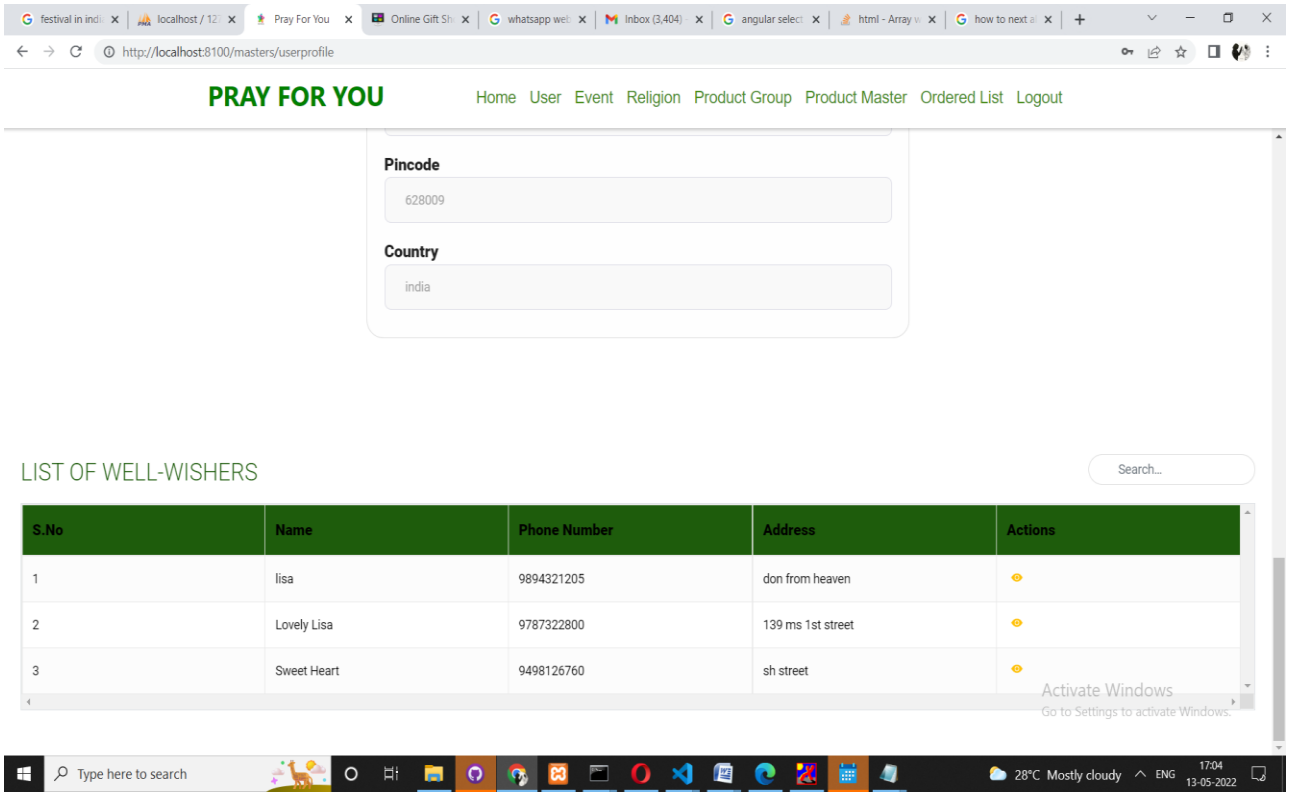
PRAY FOR YOU
Home User Event Religion Product Group Product Master Ordered List Logout
Pincode
628009
Country
india
LIST OF WELL-WISHERS
Search...
S.No
Name
Phone Number
Address
Actions
1
lisa
9894321205
don from heaven
2
Lovely Lisa
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3
Sweet Heart
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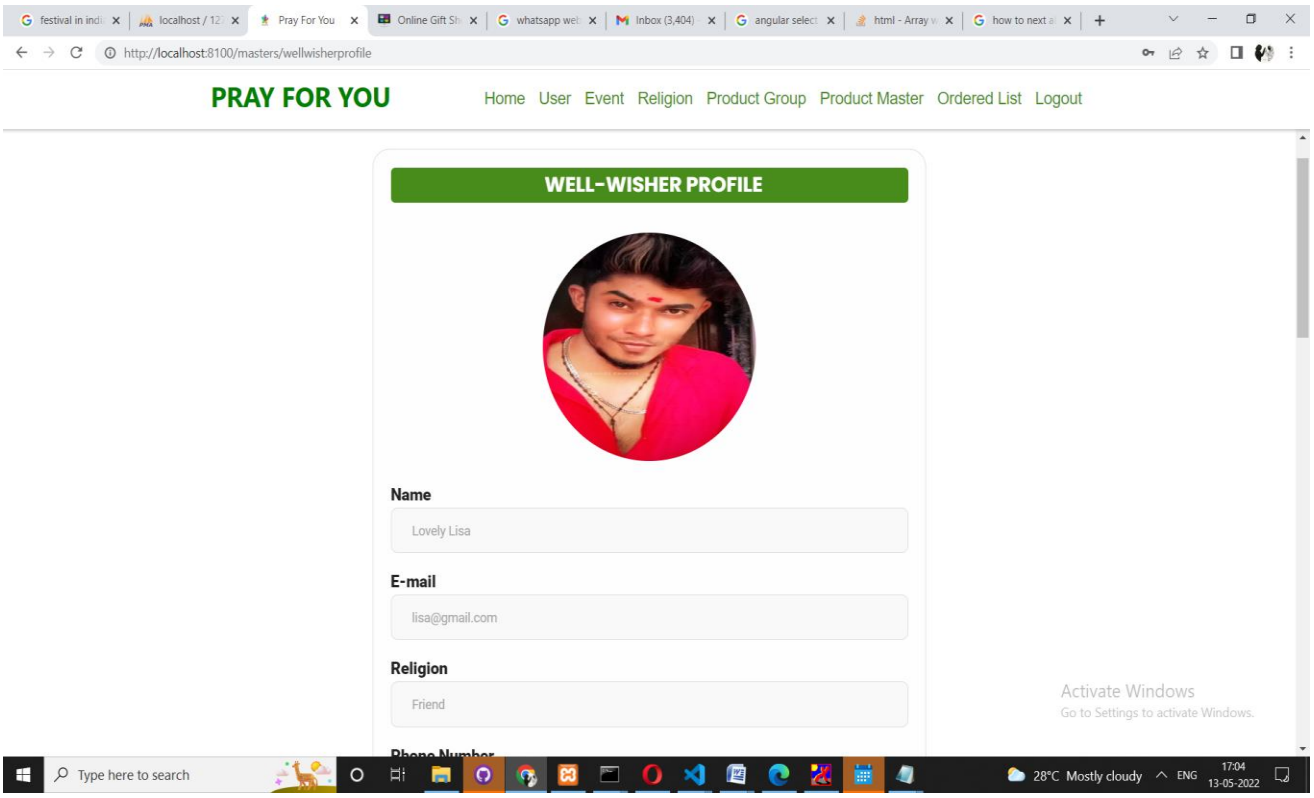
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PRAY FOR YOU
Home User Event Religion Product Group Product Master Ordered List Logout
WELL-WISHER PROFILE
Name
Lovely Lisa
E-mail
lisa@gmail.com
Religion
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Activate Windows
Go to Settings to activate Windows.
Type here to search
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ENG
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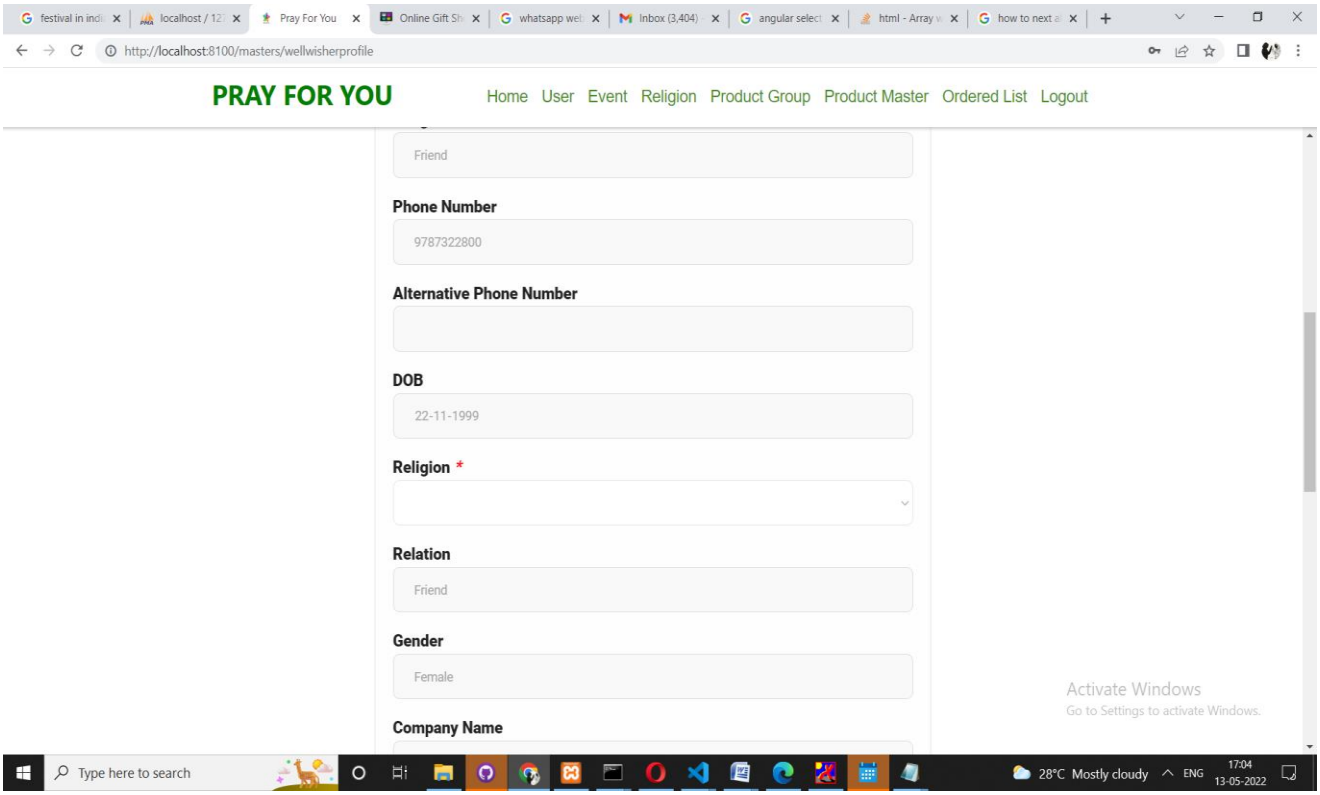
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9787322800
Alternative Phone Number
DOB
22-11-1999
Religion *
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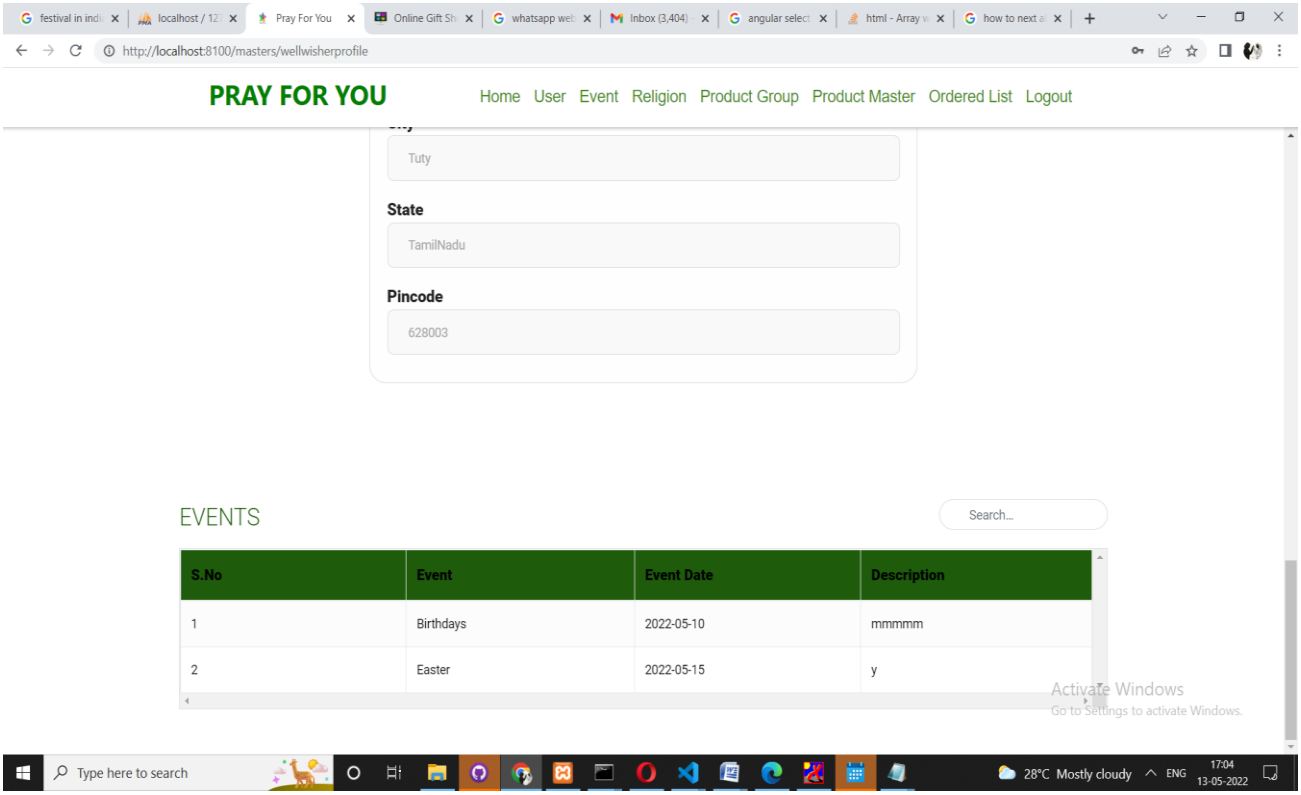

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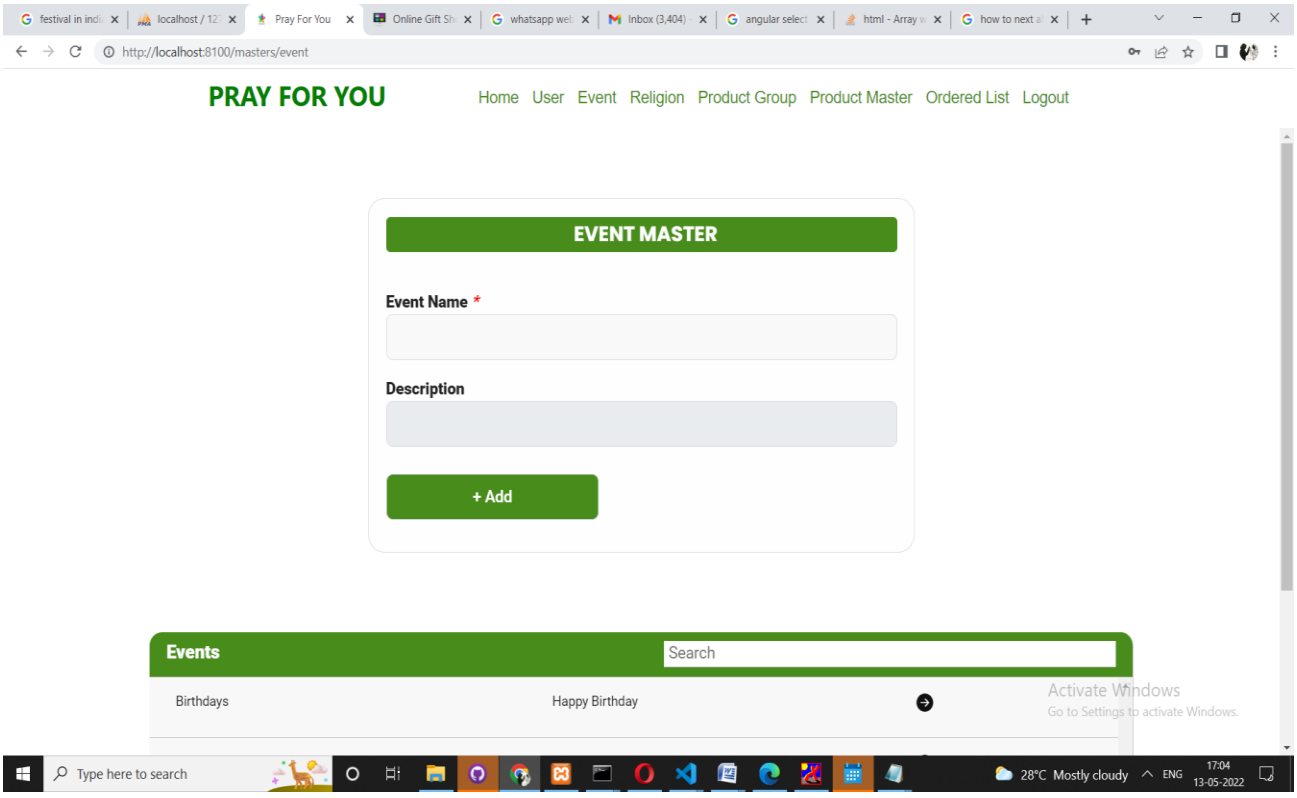

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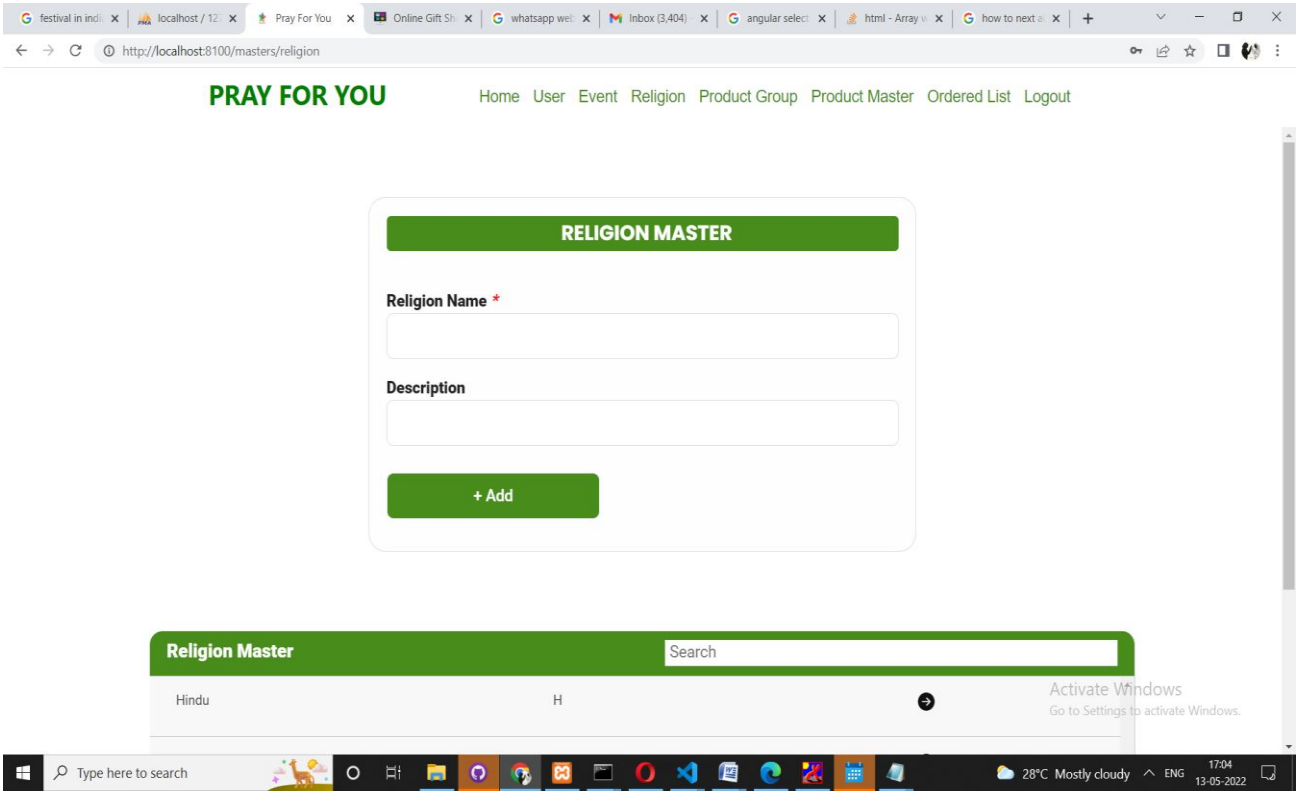

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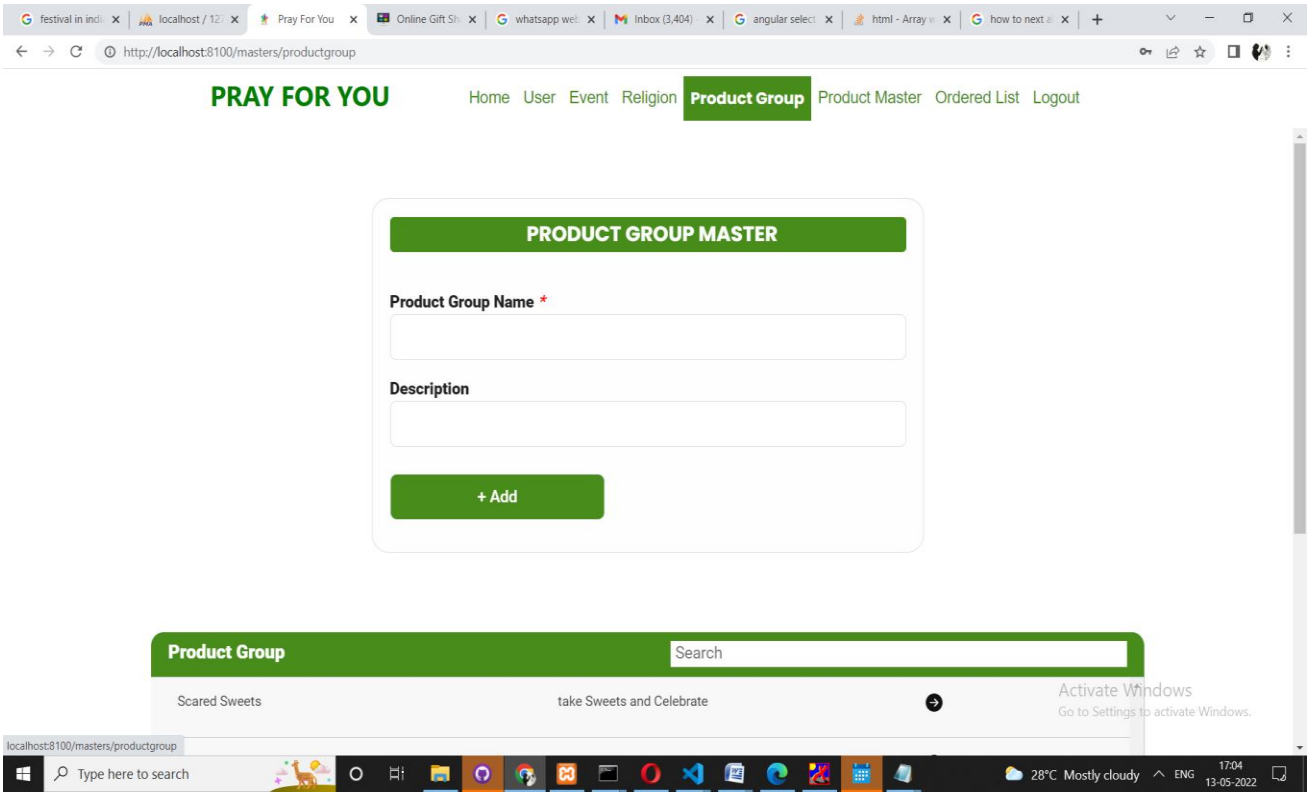

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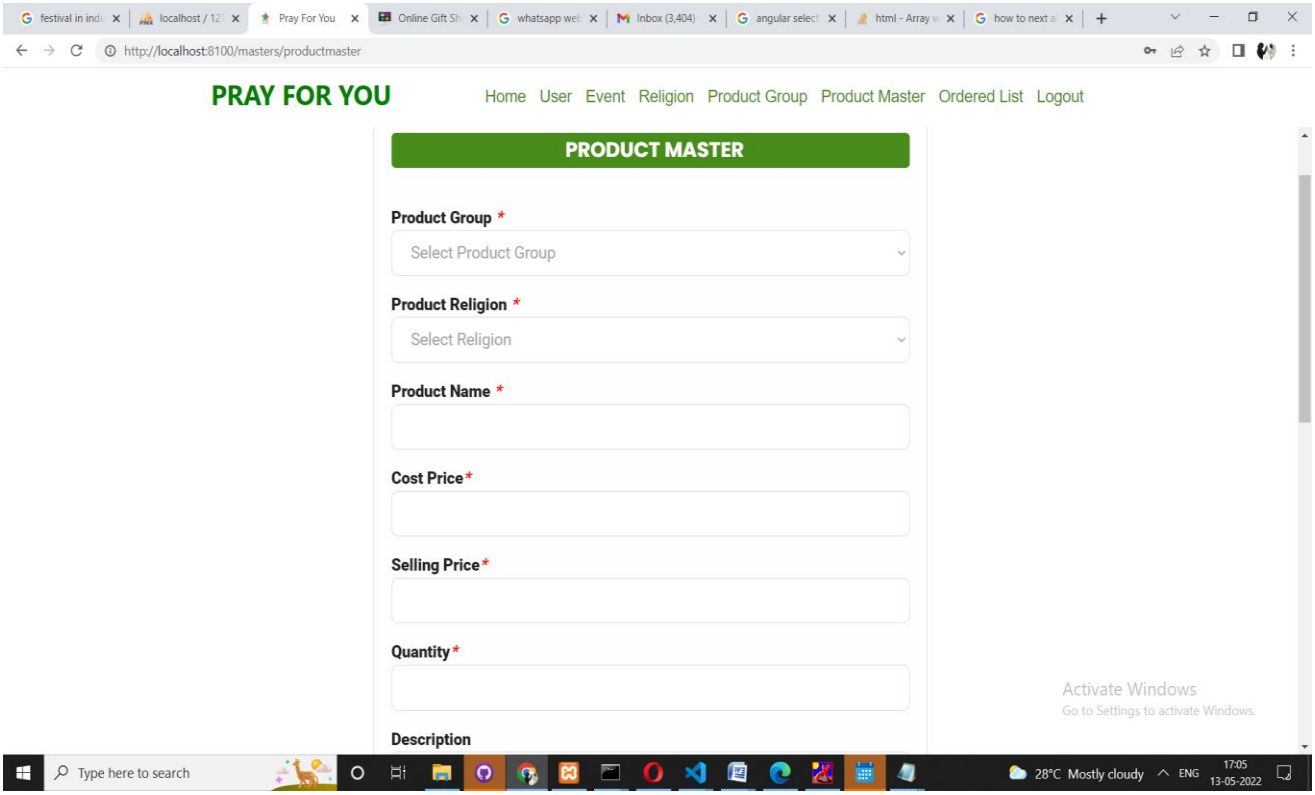

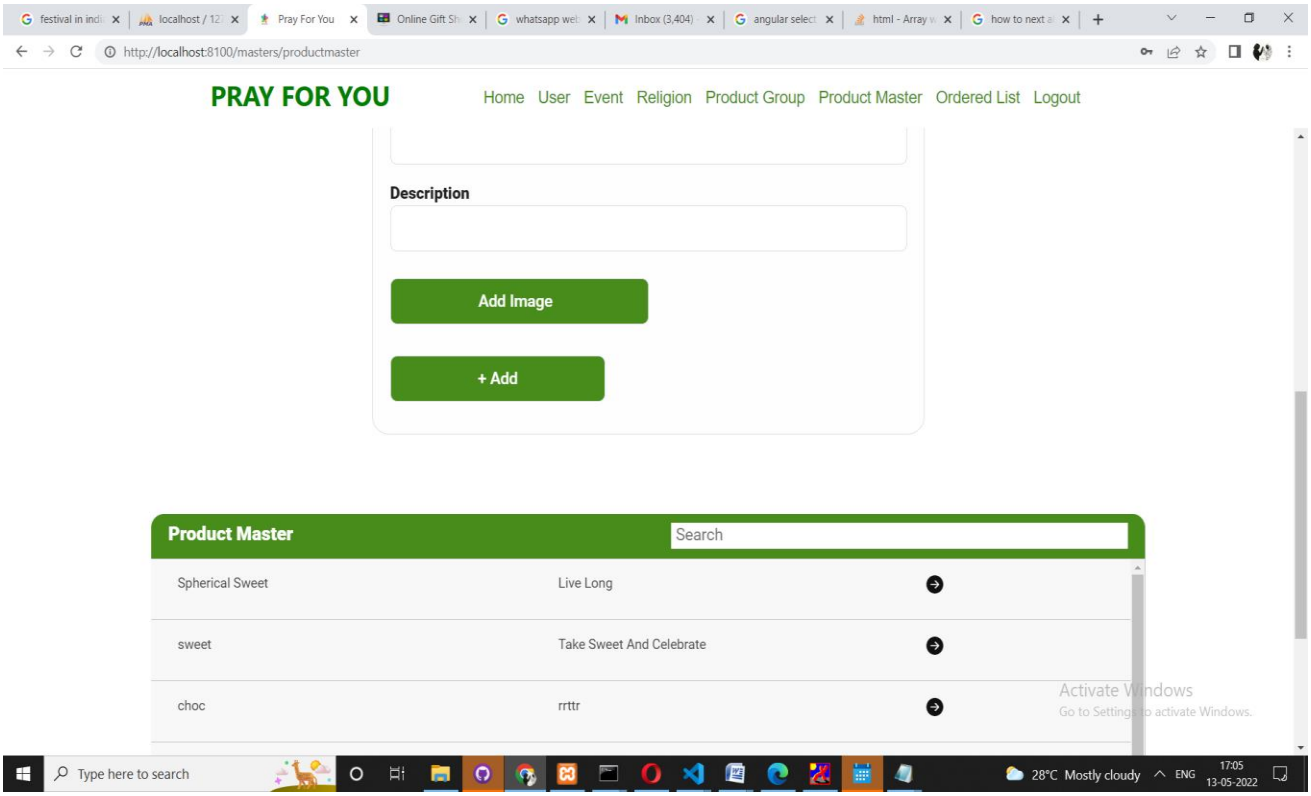

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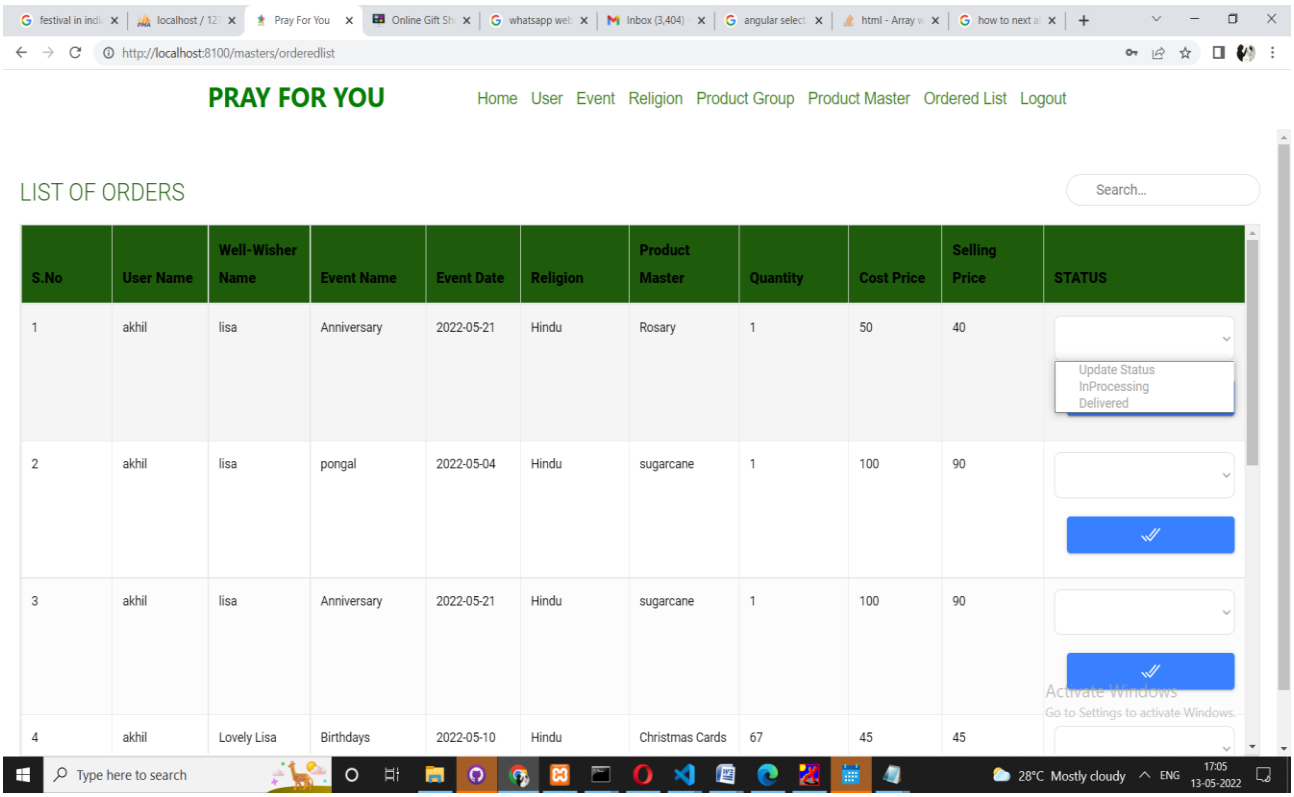

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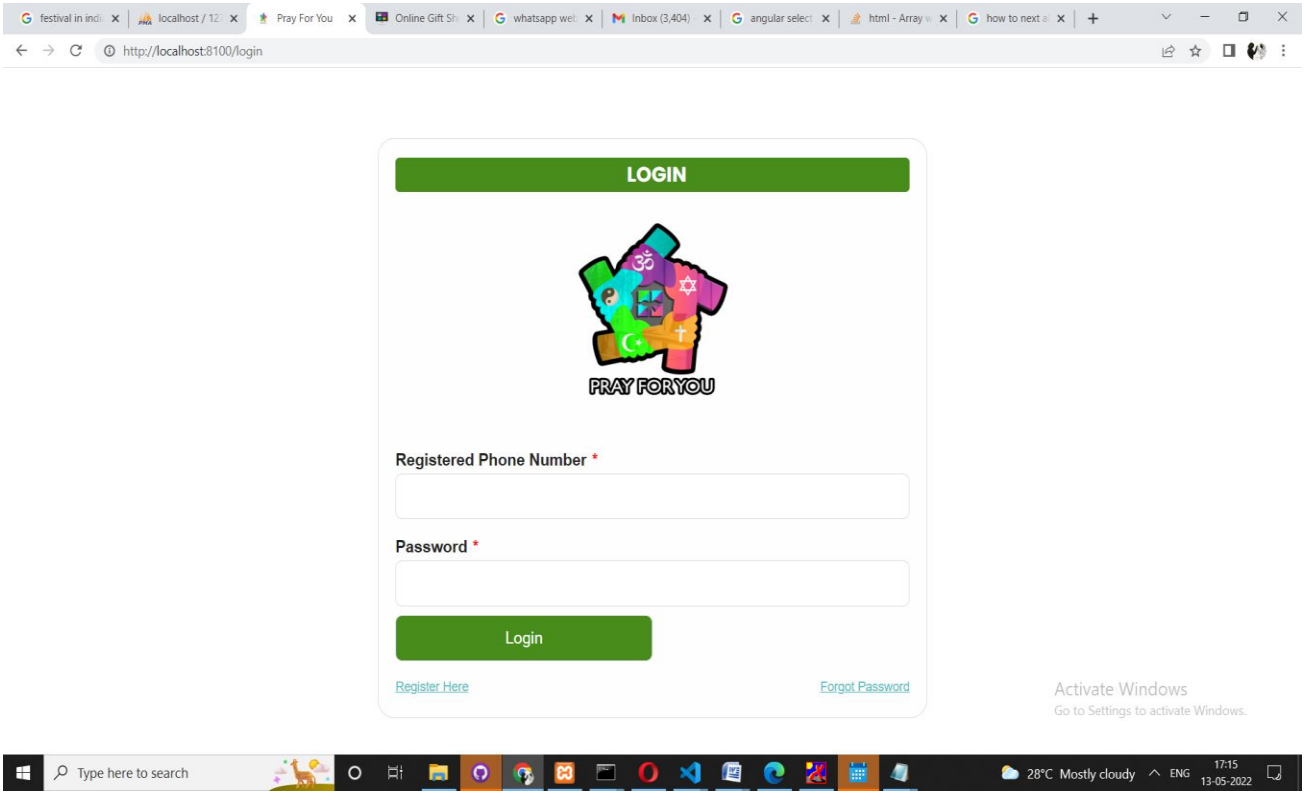

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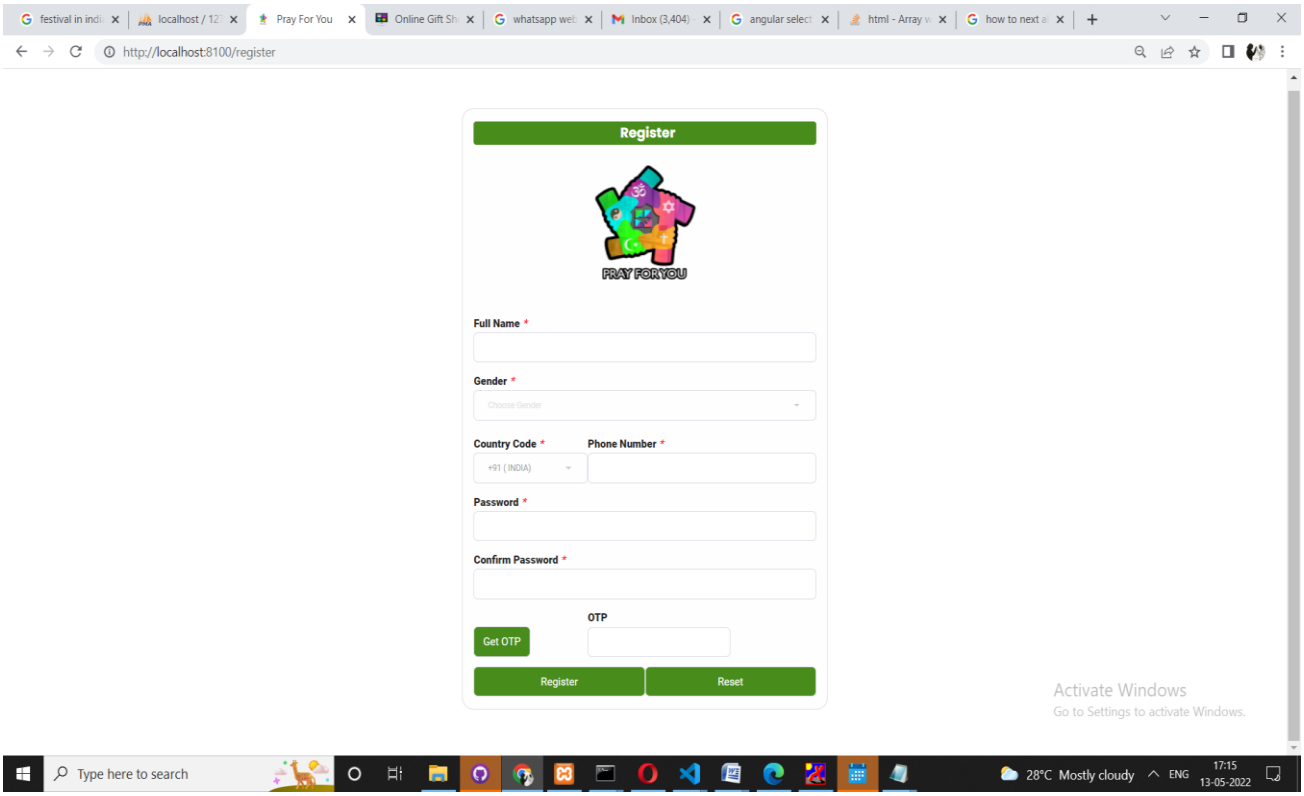

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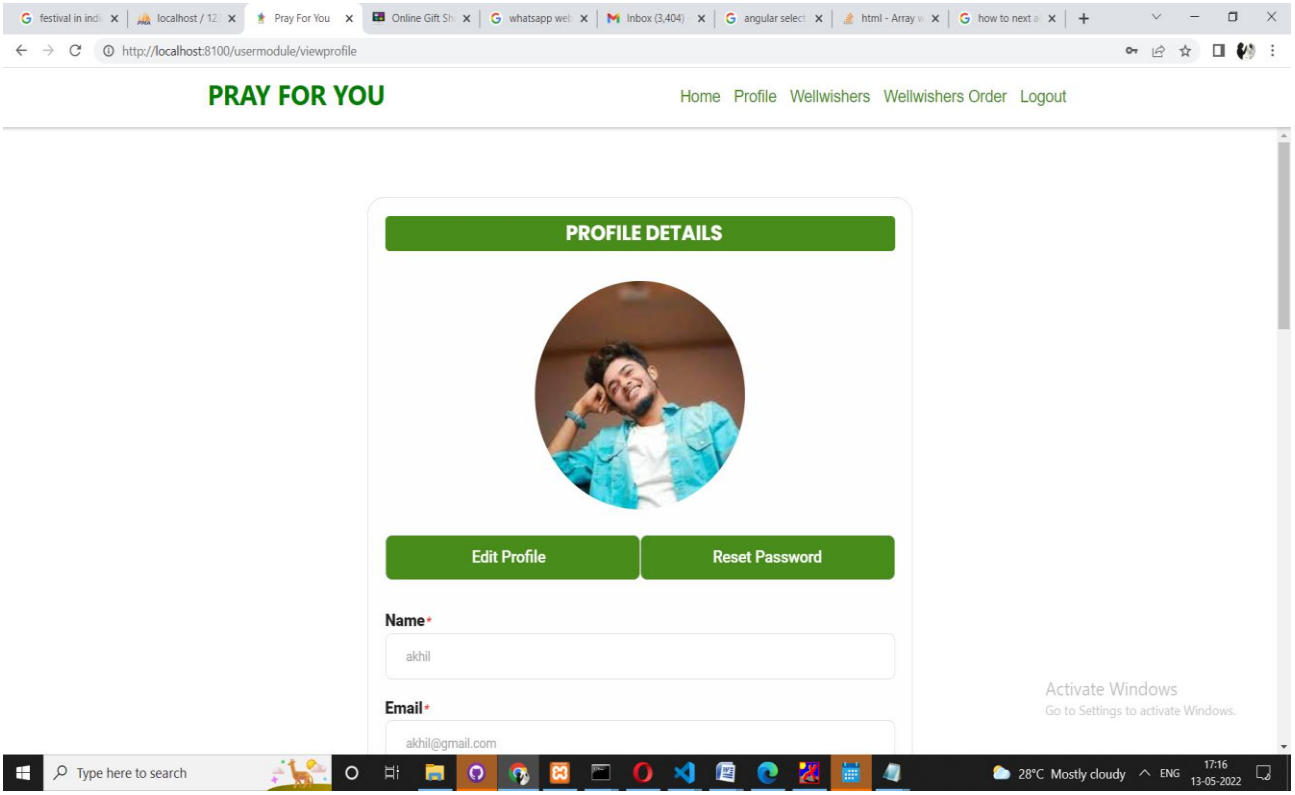
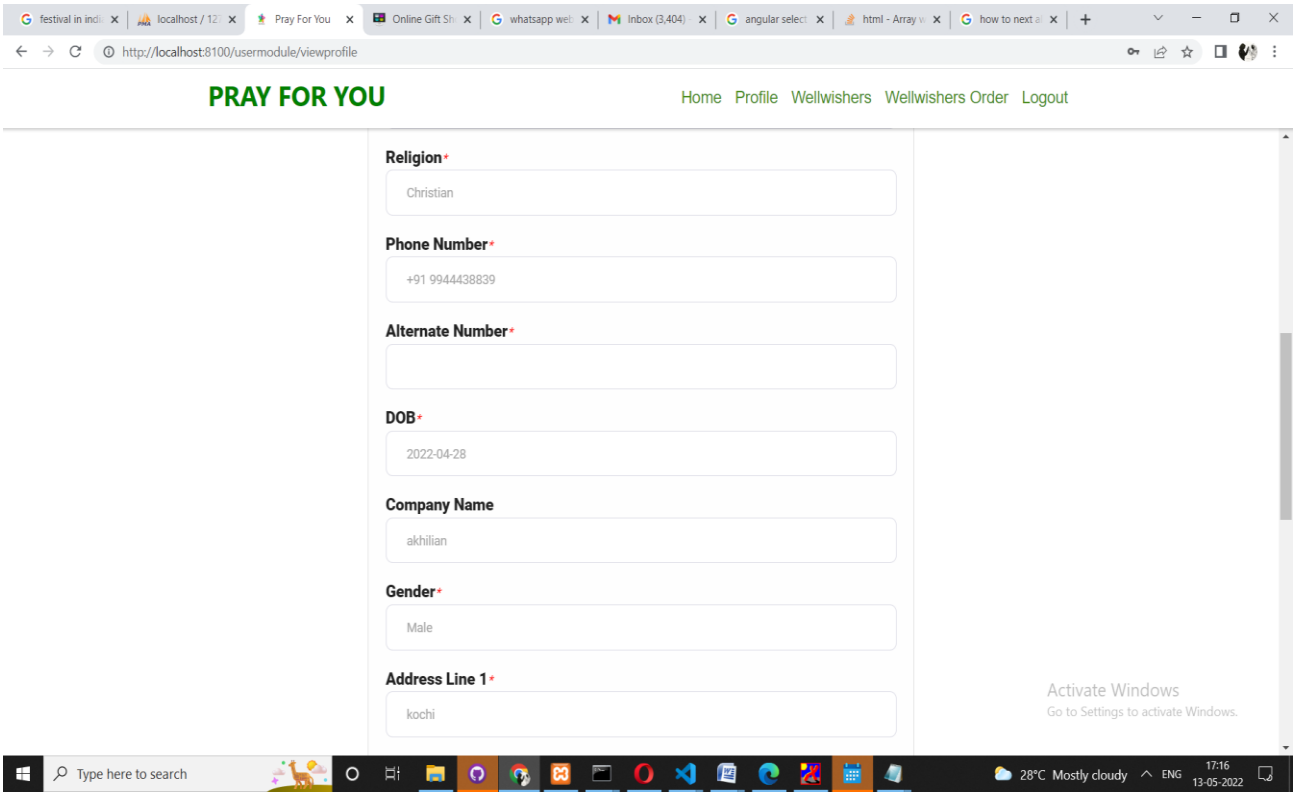

http://localhost:8100/usermodule/viewprofile
PRAY FOR YOU
Home Profile Wellwishers Wellwishers Order Logout
PROFILE DETAILS
Edit Profile
Reset Password
Name*
akhil
Email*
akhil@gmail.com
Activate Windows
Go to Settings to activate Windows.
Type here to search
28°C Mostly cloudy
ENG
17:16
13-05-2022


http://localhost:8100/usermodule/viewprofile
PRAY FOR YOU
Home Profile Wellwishers Wellwishers Order Logout
Religion*
Christian
Phone Number*
+91 9944438839
Alternate Number*
DOB*
2022-04-28
Company Name
akhilian
Gender*
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Address Line 1*
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Activate Windows
Go to Settings to activate Windows.
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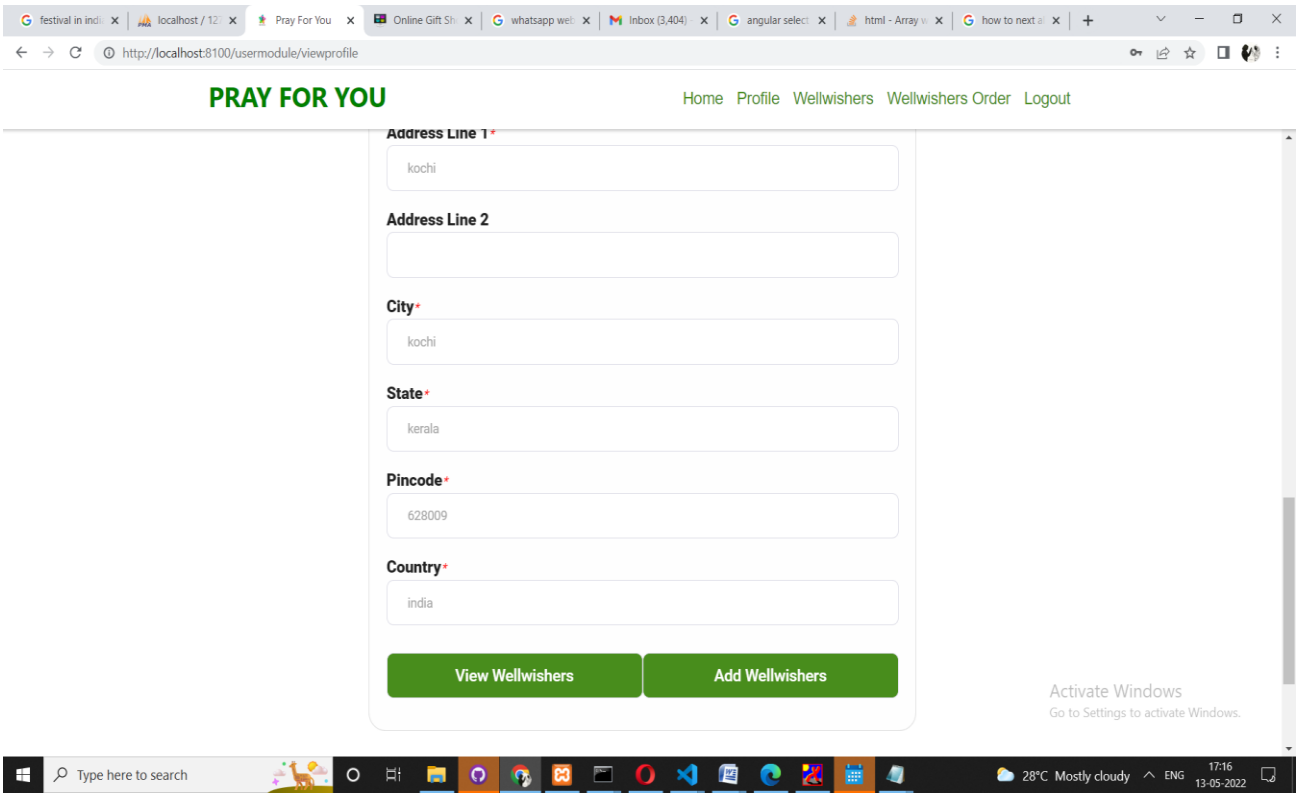
13-05-2022


PRAY FOR YOU
Home Profile Wellwishers Wellwishers Order Logout
Address Line 1*
kochi
Address Line 2
City*
kochi
State*
kerala
Pincode*
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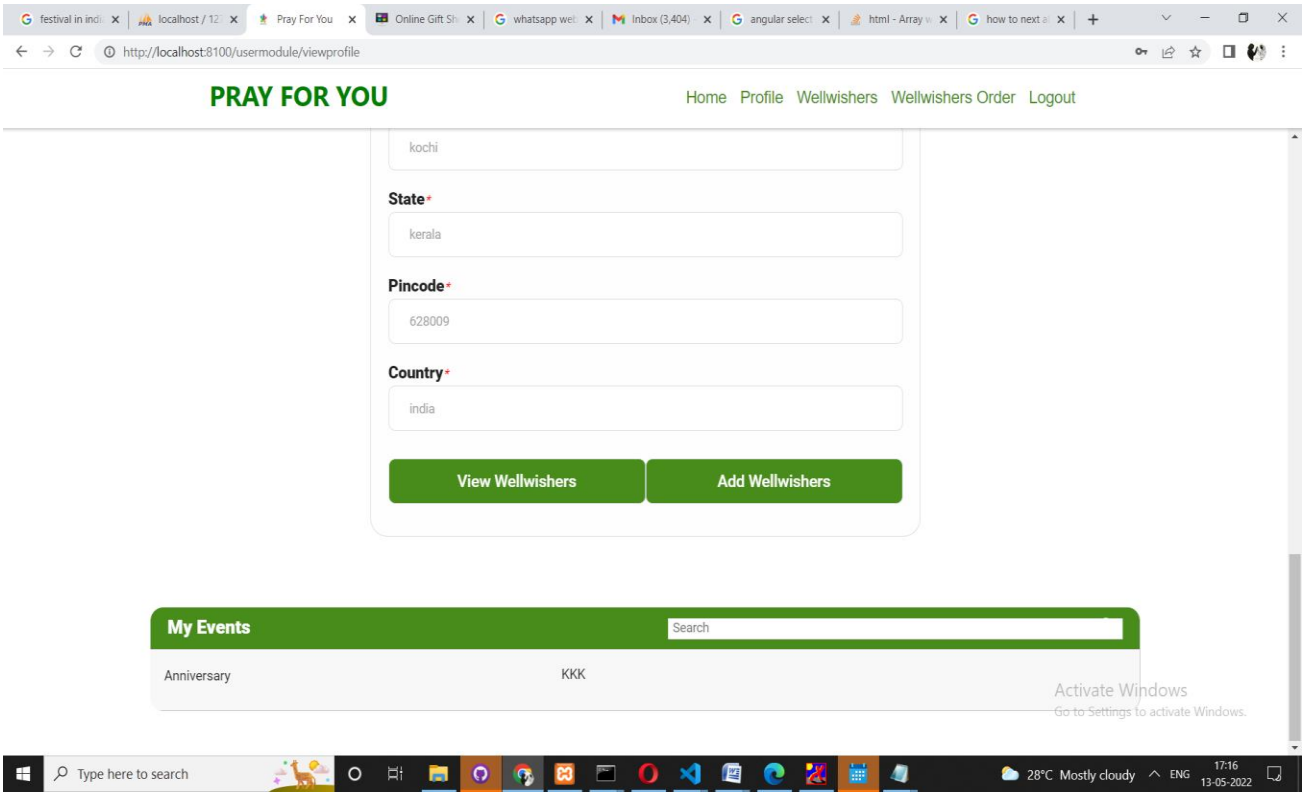
Country*
india
View Wellwishers
Add Wellwishers
Activate Windows
Go to Settings to activate Windows.


PRAY FOR YOU
Home Profile Wellwishers Wellwishers Order Logout
kochi
State*
kerala
Pincode*
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Country*
india
View Wellwishers
Add Wellwishers
My Events
Search
Anniversary
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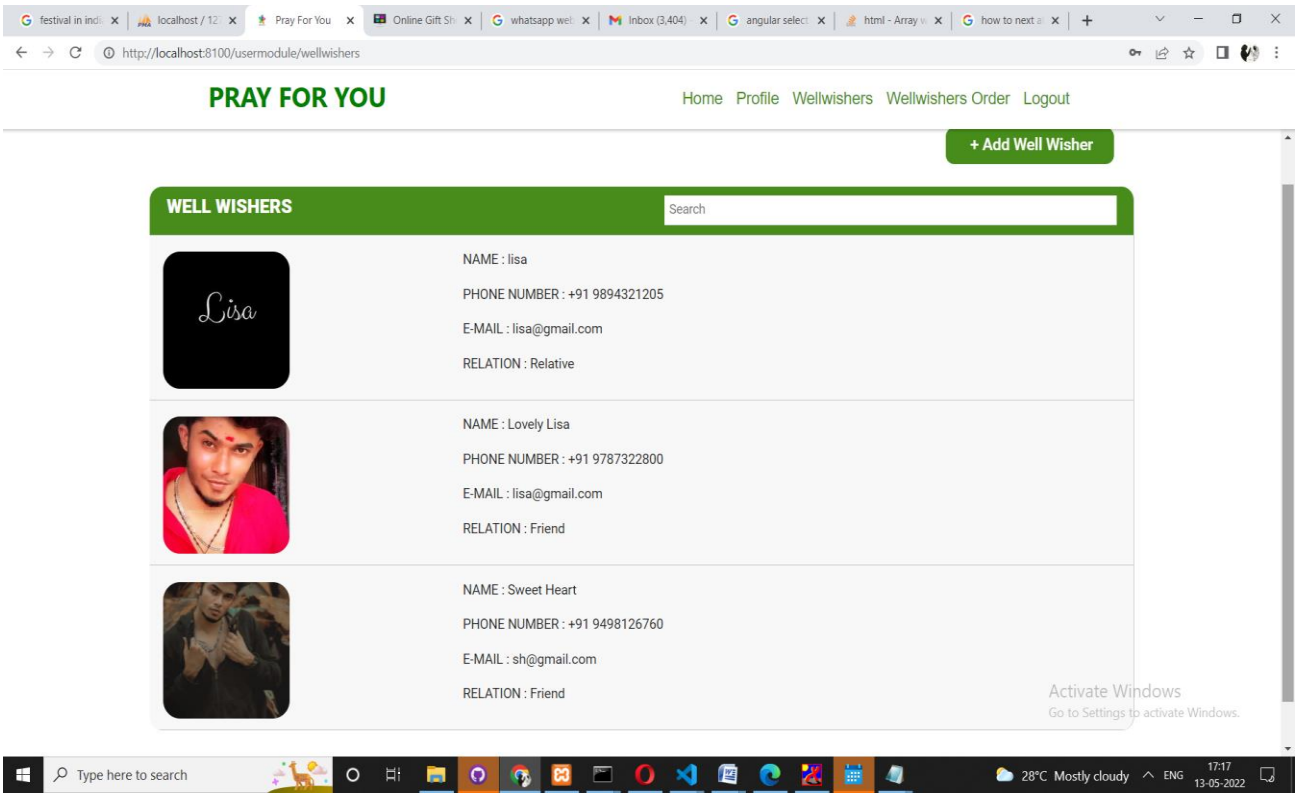
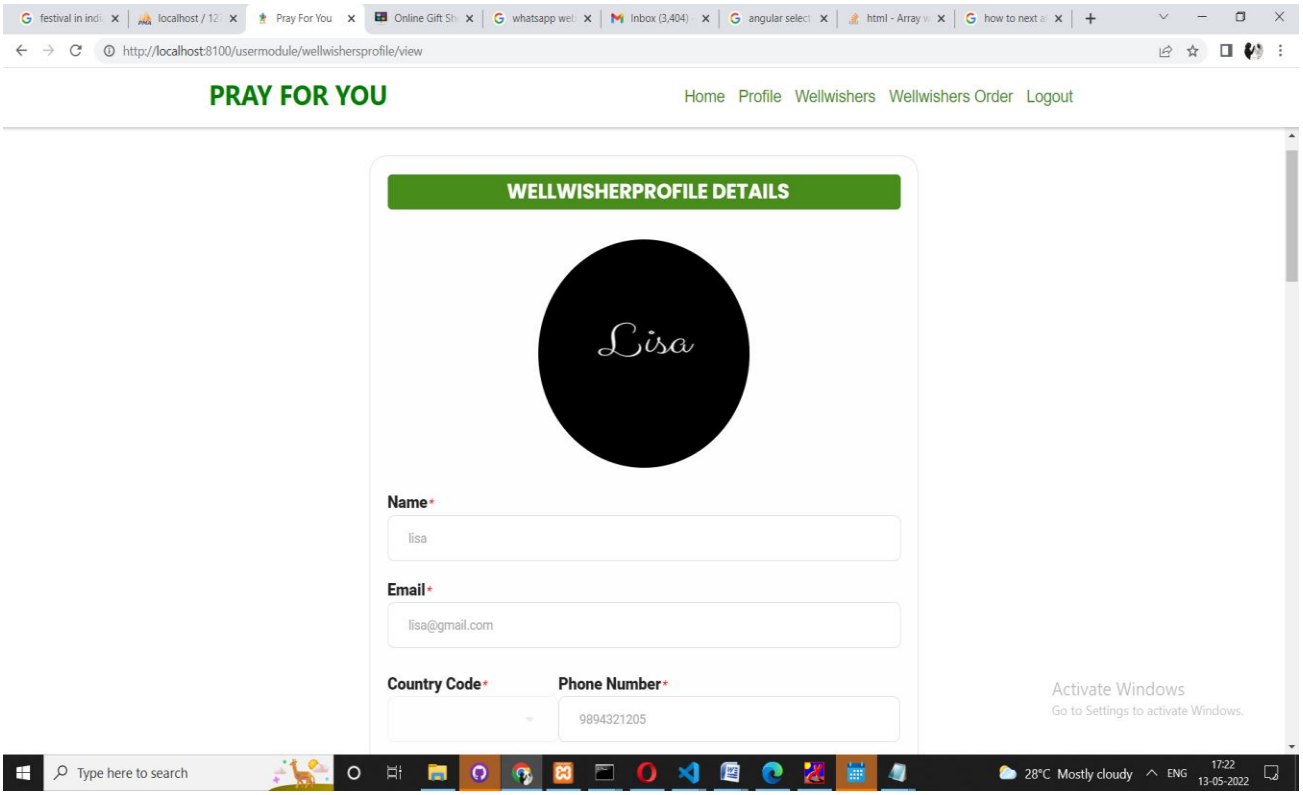
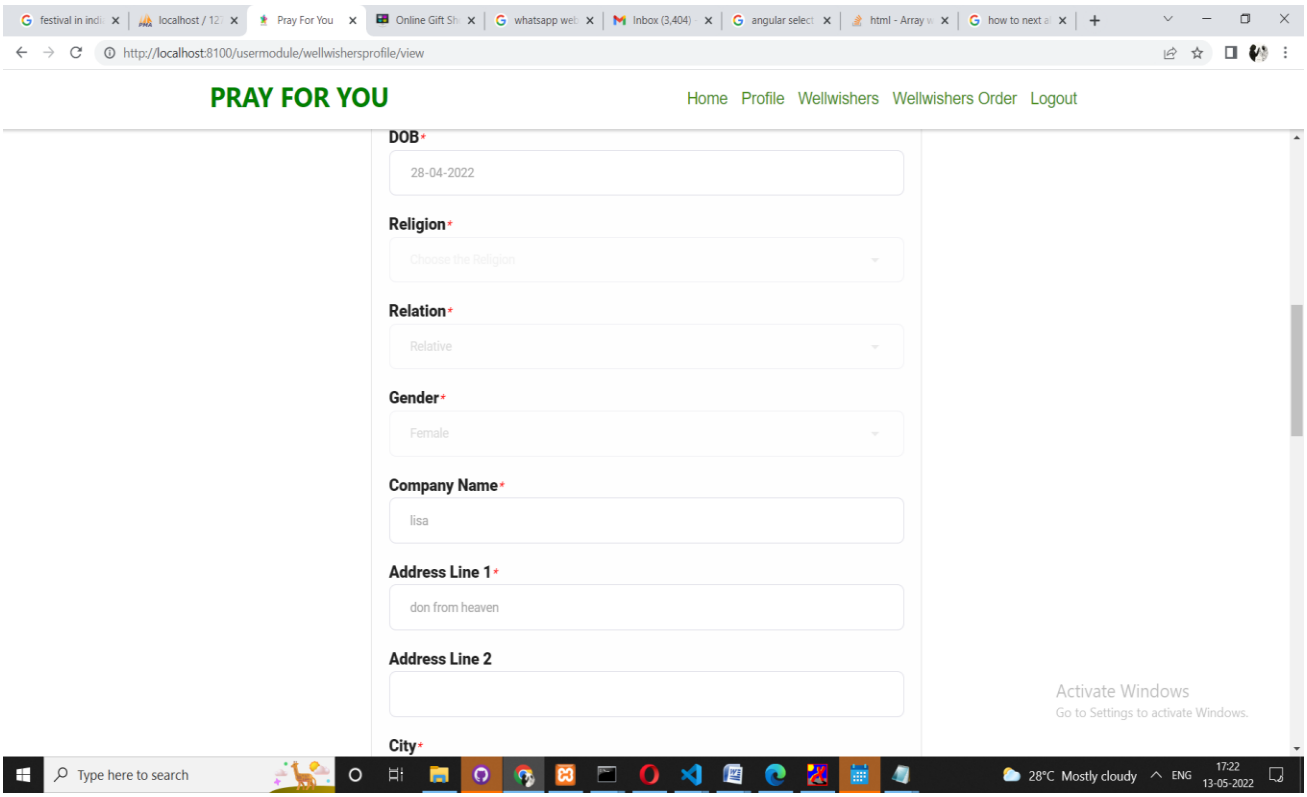
Wellwishers:






PRAY FOR YOU
Home Profile Wellwishers Wellwishers Order Logout
DOB*
28-04-2022
Religion*
Relation*
Relative
Gender*
Female
Company Name*
lisa
Address Line 1*
don from heaven
Address Line 2
City*
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Go to Settings to activate Windows.
Type here to search
28°C Mostly cloudy
ENG
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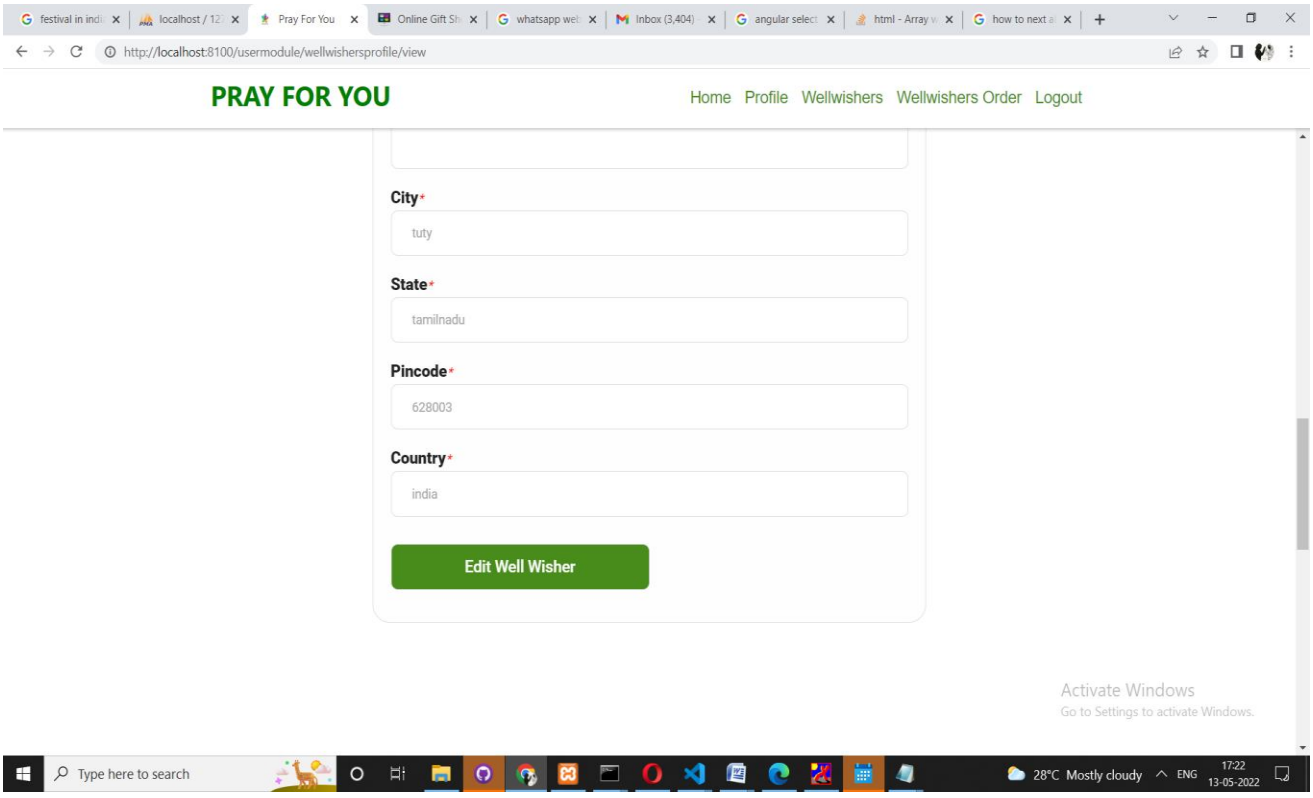
13-05-2022


PRAY FOR YOU
Home Profile Wellwishers Wellwishers Order Logout
City*
tuty
State*
tamilnadu
Pincode*
628003
Country*
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Edit Well Wisher
Activate Windows
Go to Settings to activate Windows.
Type here to search
28°C Mostly cloudy
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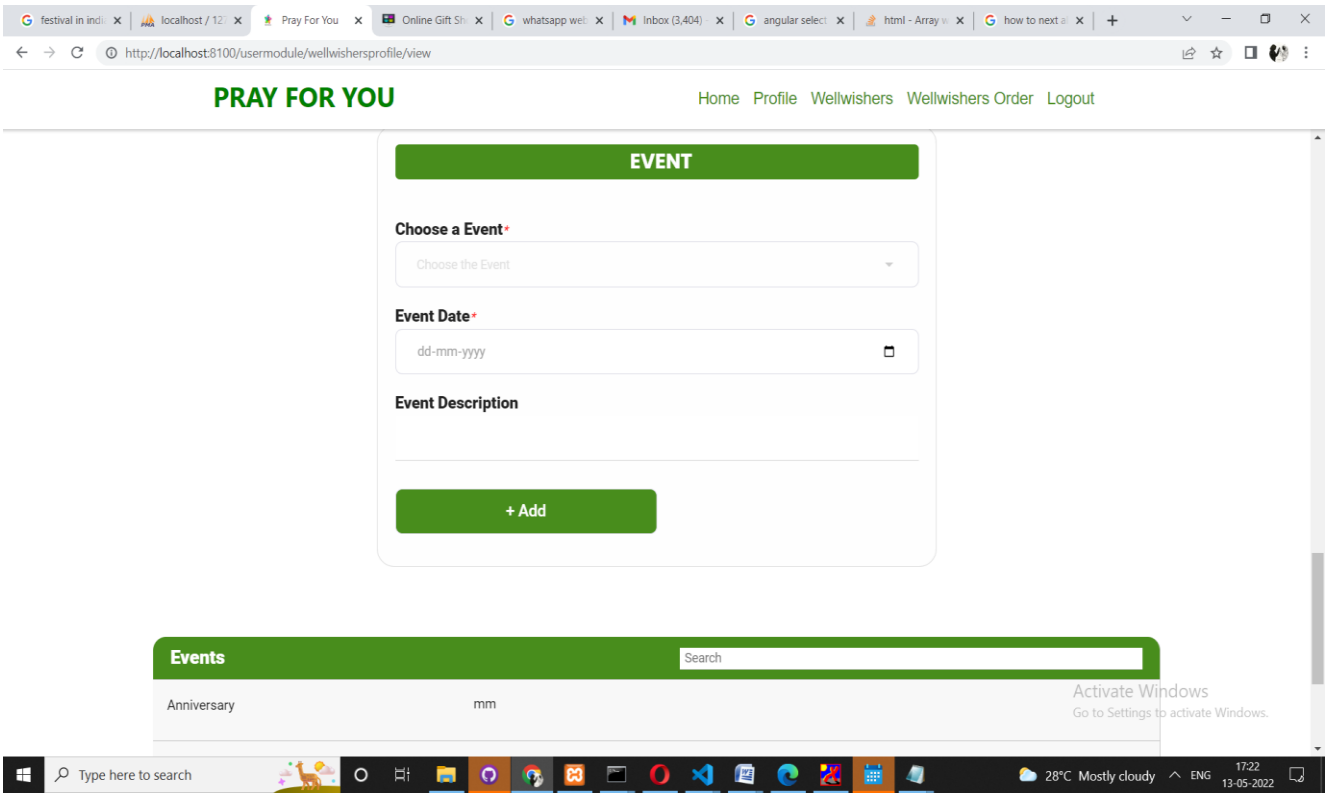
13-05-2022



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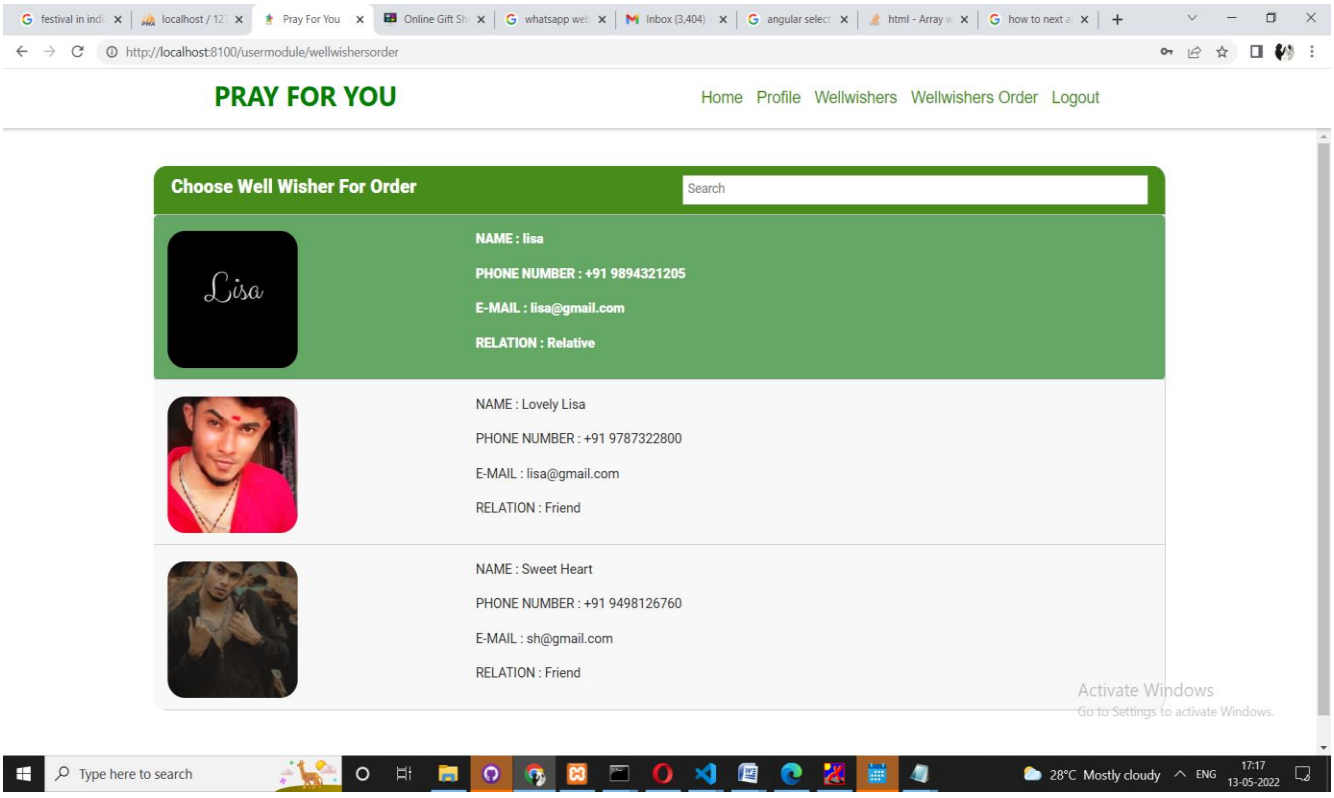

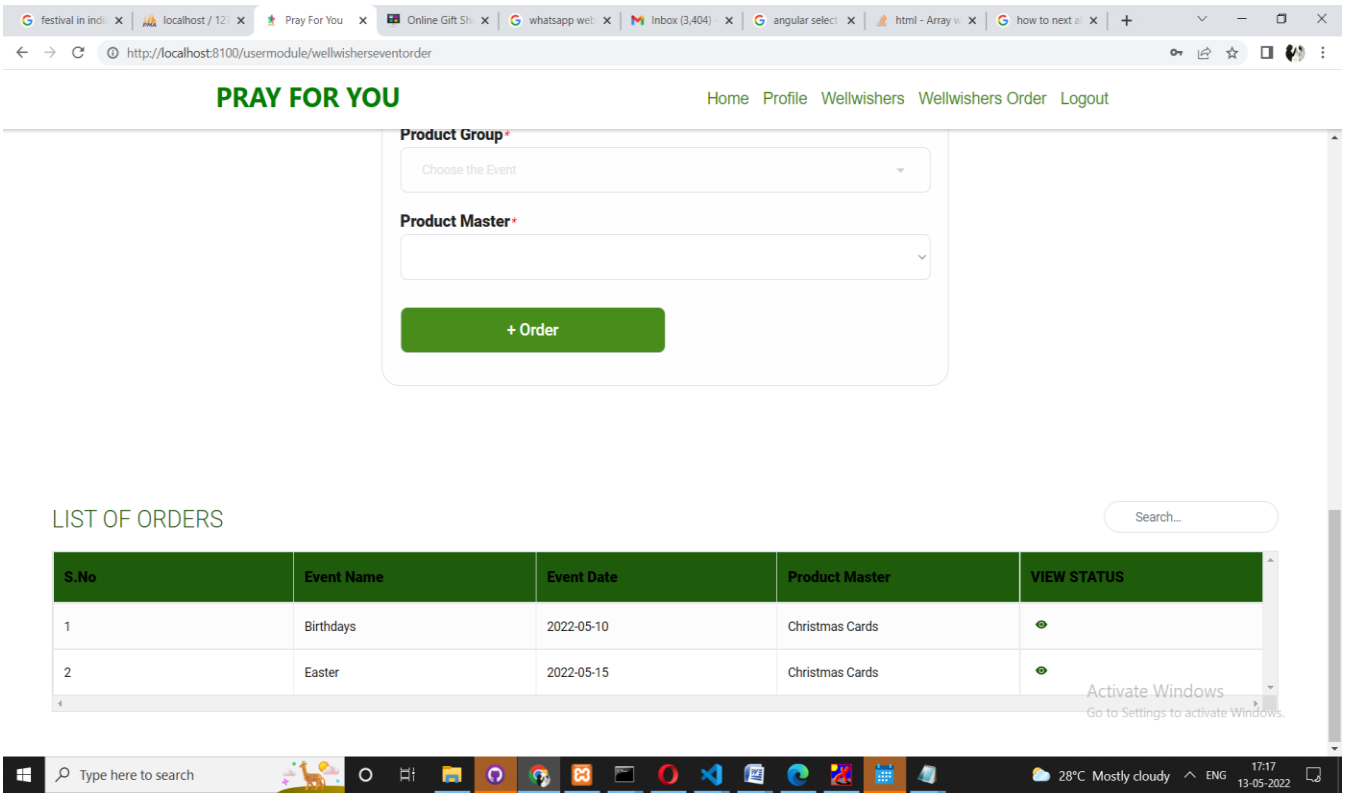
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Home Profile Wellwishers Wellwishers Order Logout
Product Group*
Choose the Event
Product Master*
+ Order
LIST OF ORDERS
Search...
S.No
Event Name
Event Date
Product Master
VIEW STATUS
1
Birthdays
2022-05-10
Christmas Cards
2
Easter
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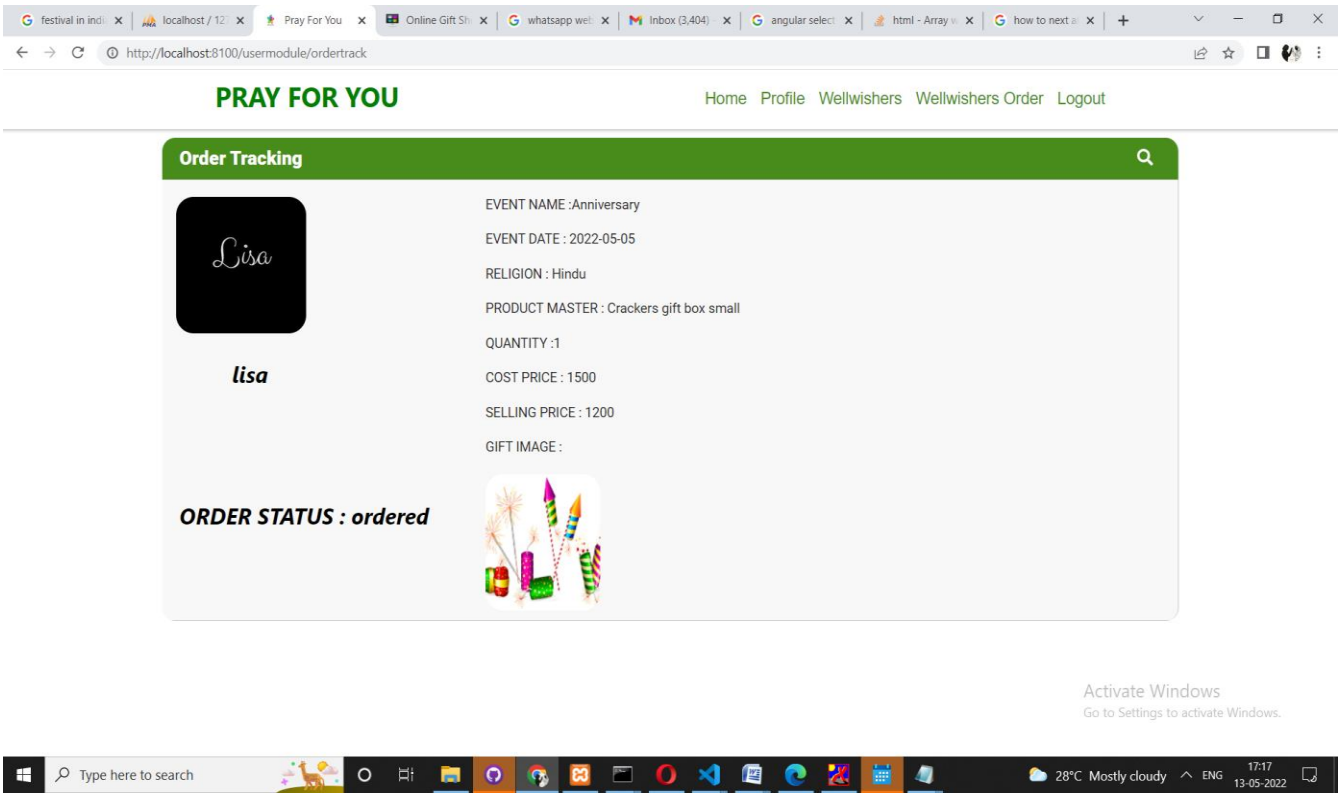
http://localhost:8100/usermodule/ordertrack
PRAY FOR YOU
Home Profile Wellwishers Wellwishers Order Logout
Order Tracking
Lisa
lisa
EVENT NAME :Anniversary
EVENT DATE : 2022-05-05
RELIGION : Hindu
PRODUCT MASTER : Crackers gift box small
QUANTITY :1
COST PRICE : 1500
SELLING PRICE : 1200
GIFT IMAGE :
ORDER STATUS : ordered
Activate Windows
Go to Settings to activate Windows.
Type here to search
28°C Mostly cloudy
ENG
17:17
13-05-2022

CONCLUSION

In this project, the user is provided with the website link of “Gift Distribution System” that can be used to gift their well-wisher through online mode. This project is also provided with the Administrative to implement this as a web application we used ionic/angular and Django. The Gift distribution system described in this project provides a number of features that are designed to make the customer more comfortable. This project helps in understanding the creation of an interactive web page and the technologies used to implement it.

FUTURE ENHANCEMENT

Though it is a successful project, it could be still improved further, according to some specific needs.

- Payment Gateway can be further included.
- Location Tracking for the order can be implemented.
- Cancellation of the order can be further included.

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- www.w3schools.com/angular/default.asp

FACIAL EXPRESSION RECOGNITION USING FAST FREQUENCY NEURAL NETWORK

A project submitted to

ST. MARY'S COLLEGE (Autonomous), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

In partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

G. SAHAYA NAVEETHA

Reg. No.: 20SPCS18

Under the Supervision and Guidance of

Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D.,

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi-628001

May 2022

CERTIFICATE

This is to certify that this project work entitled **"FACIAL EXPRESSION RECOGNITION USING FAST FREQUENCY NEURAL NETWORK"** is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to **Manonmaniam Sundaranar University, Tirunelveli,** in partial fulfillment for the award of the degree of Master of Science in **Computer Science** for the work done during the year 2021-2022 by **G. SAHAYA NAVEETHA (Reg. No.: 20SPCS18)**.

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do here by declare that, the project entitled **"FACIAL EXPRESSION RECOGNITION USING FAST FREQUENCY NEURAL NETWORK"** submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Dr. A. Vithya Vijayalakshmi MCA., M.Phil., Ph.D.,** Assistant Professor, PG Department of Computer Science(SSC), St. Mary's College (Autonomous),Thoothukudi.

Station: Thoothukudi **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal, Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani , Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and SSC Coordinator, PG Department of Computer Science (SSC) for her support and counsel.

I express my hearty thanks to my guide Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC) for her Valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to Ms. A. Jenitta Jebamalar M.Sc. (IT), M.Sc. (CS), M.Phil., B.Ed., Assistant Professor, PG Department of Computer Science (SSC) for her encouragement and support.

I am much indebted to Dr.P.Johnson Durai Raj, Director, Postulate Infotech for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

POSTULATE

14-05-2022

To

The Head of the Department

PG Department of Computer Science (SSC)

St. Mary's College (Autonomous)

Thoothukudi

Dear Sir/Madam,

Sub: Project Completion Certificate-Reg

On behalf of **POSTULATE**, We are pleasure to inform you that **Ms. G. Sahaya Naveetha, Reg no: 20SPCS18** studying **Master of Computer Science** Final year has been done the project work at our concern on **"Facial Expression Recognition Using Fast Frequency Neural Network"** during the period from February 2022 to May 2022.

During this period, we noticed her to be diligent, sincere and hardworking and she accomplished her task within stipulated deadline. We wish her for all future endeavors.

POSTULATE INFO TECH THOOTHUKUDI

PROJECT DIRECTOR

ABSTRACT

Facial expression recognition has become a newly-emerging topic in recent decades, which has important value in the field of human-computer interaction. In this work, we present a deep learning based approach, named convolutional neural network, for facial expression recognition. Different from convolutional neural network in spatial domain, convolutional neural network inherits the advantages of processing image in vector/scalar domain, such as efficient computation and spatial redundancy elimination. First, we propose the learnable multiplication kernel and construct multiple multiplication layers to learn features infrequency domain. Second, a summarization layer is proposed following multiplication layers to further yield high-level features. Third, based on the property of vector/scalar image, we utilize multiplication layers and summarization layer to construct the Basic-Convolutional neural network, which can yield high-level features. Finally, to further achieve better performance on Basic- convolutional neural network, we propose the Block- convolutional neural network in which the weight-shared multiplication kernel is designed for feature learning and the block sub-sampling is designed for dimension reduction. The experimental results show that the Block- Fast frequency neural network not only achieves superior performance, but also greatly reduces the computational cost. To our best knowledge, the proposed approach is the first attempt to fill in the blank of frequency based deep learning model for facial expression recognition.

TABLE OF CONTENT

SL.NO	CONTENTS	PAGE NO.
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1	INTRODUCTION	1
2	SYSTEM SPECIFICATION	3
3	SYSTEM DESIGN	8
4	PROJECT DESCRIPTION	13
5	MODULE DESCRIPTION	15
6	SYSTEM STUDY	19
7	SYSTEM ANALYSIS	21
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1. INTRODUCTION

Facial Expression conveys non-verbal cues, which plays an important roles in interpersonal relations. The Facial Expression Recognition system is the process of identifying the emotional state of a person. In this system captured image is compared with the trained dataset available in database and then emotional state of the image will be displayed. As a branch of pattern recognition, it has a great value in the field of human-computer interaction, computer vision and psychology. Research of facial expression recognition (FER) intends to enable a machine to recognize facial expression.

The system classifies facial expression of the same person into the basic emotions namely angry, neutral, fearful, happy, sad and surprised. The main purpose of this system is efficient interaction between human beings and machines using eye gaze, facial expressions, cognitive modeling etc. Here, detection and classification of facial 2 expressions can be used as a natural way for the interaction between man and machine. And the system intensity vary from person to person and also varies along with age, gender, size and shape of face, and further, even the expressions of the same person do not remain constant with time.

Facial expression recognition has become a newly-emerging topic in recent decades, which has important value in the field of human-computer interaction. This project is developed using a deep learning based approach, named convolutional neural network (CNN), for facial expression recognition. Convolutional neural network in spatial domain, inherits the advantages of processing image in scalar/vector domain, such as efficient computation and spatial redundancy elimination.

First, we propose the learnable multiplication kernel and construct multiple multiplication layers to learn features in frequency domain. Second, a summarization layer is proposed following multiplication layers to further yield high-level features. Third, based on the property of scalar/vector, we utilize multiplication layers and summarization layer to construct the Basic convolutional neural network (CNN), which can yield high-level features on the widely used feature. Finally, to further achieve better performance on Basic- convolutional neural network, we propose the Block-convolutional neural network, in which the weight-shared multiplication kernel is designed for feature learning and the block sub-sampling is designed for dimension reduction.

The experimental results show that the Block-convolutional neural network not only achieves superior performance, but also greatly reduces the computational cost. To our best knowledge, the proposed approach is the first attempt to fill in the blank of frequency based deep learning model for facial expression recognition using spyder(python) technology.

Aim

Facial expression recognition has become a newly-emerging topic in recent decades, which has important value in the field of human-computer interaction. Analysis the emotional expressions of human being. Facial expression recognition is the task of classifying the expressions on face images into various categories such as angry, fear, sad, happy etc.

Objectives

1. To develop a facial expression recognition system.

2. To experiment machine learning algorithm in computer vision fields.

3. To detect emotion thus facilitating Intelligent Human-Computer Interaction.

Scope and Applications

The scope of this system is to tackle with the problems that can arise in day to day life. Some of the scopes are:

1. The system can be used to detect and track a user's state of mind.
2. The system can be used in mini-marts, shopping center to view the feedback of the customers to enhance the business,
3. The system can be installed at busy places like airport, railway station or bus station for detecting human faces and facial expressions of each person. If there are any faces that appeared suspicious like angry or fearful, the system might set an internal alarm.
4. The system can also be used for educational purpose such as one can get feedback on how the student is reacting during the class.
5. This system can be used for lie detection amongst criminal suspects during interrogation
6. This system can help people in emotion related -research to improve the processing of emotion data.
7. Clever marketing is feasible using emotional knowledge of a person which can be identified by this system.

2. SYSTEM SPECIFICATION

HARDWARE SPECIFICATION

COMPONENT	SPECIFICATION
Processor	Pentium-IV
Speed	1.1 GHZ
RAM	512 MB
Hard Disk	40 GB
Key Board	Standard Windows Key
Mouse	SVGA

SOFTWARE SPECIFICATION

COMPONENT	SPECIFICATION
Operating System	Windows 8/7/10
Tools	Spyder (python)
Front End	TKinter
Back End	Tensorflow

Python technology

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse.

Language Paradigms: Interpreted language.

- Simple
- Readable and Maintainable Code
- Architecture neutral
- Many Open Source Frameworks and Tools
- Dynamic semantics
- Portable
- High performance
- Simplify Complex Software Development
- Interpreted
- Multithreaded
- Robust standard Library
- Dynamic
- Secure

With most programming languages, python is a general purpose and high level programming language. You can use Python for developing desktop GUI applications, websites and web applications. Also, Python, as a high level programming language, allows you to focus on core functionality of the application by taking care of common programming tasks. The simple syntax rules of the programming language further makes it easier for you to keep the code base readable and application maintainable.

The python Platform

Overview:

In this section, the author details the technologies that he has used for this project. Although there are many tools that exist out there in the market, the author has found that these tools outlined perform well for the problem that needs to be solved.

Python

Python is a high level interpreted language used for general purpose programming. It is widely used for scientific computing and can be used for a wide variety of general tasks from data mining to software development. Python is the main language used for this project.

Anaconda

Anaconda is a popular data science platform where you can create data science projects and machine learning. Libraries such as NumPy, Pandas, Matplotlib, Tensorflow and etc come with Anaconda and IDE's such as Jupyter Notebook, Spyder and etc.

Numpy

NumPy is an acronym for "Numeric Python" or "Numerical Python". It is an open source extension module for Python, which provides fast precompiled functions for mathematical and numerical routines. Furthermore, NumPy enriches the programming language Python with powerful data structures for efficient computation of multi-dimensional arrays and matrices. The implementation is even aiming at huge matrices and arrays. Besides that the module supplies a large library of high-level mathematical functions to operate on these matrices and arrays.

It is the fundamental package for scientific computing with Python. It contains various features including these important ones:

- A powerful N-dimensional array object
- Sophisticated (broadcasting) functions
- Tools for integrating C/C++ and Fortran code
- Useful linear algebra, Fourier Transform, and random number capabilities.

Pandas

Pandas is also a library in Python, like numpy is also used for data pre-processing and preparation. One of the main features about pandas is the DataFrame and Series data structure. These data structures are optimized and contain fancy indexing that allow a variety of features such as reshaping, slicing, merging, joining and etc to be available. Pandas and Numpy are extremely powerful when used together for manipulating data.

Matplotlib

Matplotlib is a Python plotting library that allows programmers to create a wide variety of graphs and visualizations with ease of use. The great feature about Matplotlib is that it integrates very well with Jupyter Notebook and creating visualizations is simplified. Matplotlib also works very well with pandas and numpy.

OpenCV

OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products. Being a BSD-licensed product, OpenCV makes it easy for businesses to utilize and modify the code. The library has more than 2500 optimized algorithms, which includes a comprehensive set of both classic and state-of-the-art computer vision and machine learning algorithms. These algorithms can be used to detect and recognize faces, identify objects, classify human actions in videos, track camera movements, track moving objects, extract 3D models of objects, produce 3D point clouds from stereo cameras, stitch images together to produce a high resolution image of an entire scene, find similar images from an image database, remove red eyes from images taken using flash, follow eye movements, recognize scenery and establish markers to overlay it with augmented reality, etc. OpenCV has more than 47 thousand people of user community and estimated number of downloads exceeding 14 million. The library is used extensively in companies, research groups and by governmental bodies. It has C++, Python, Java and MATLAB interfaces and supports Windows, Linux, Android and Mac OS. OpenCV leans mostly towards real-time vision applications and takes advantage of MMX and SSE instructions when available. A full-featured CUDAand OpenCL interfaces are being actively developed right now. There are over 500 algorithms and about 10 times as many functions that compose or support those algorithms.

OpenCV is written natively in C++ and has a templated interface that works seamlessly with STL containers.

Tensorflow

Tensorflow is an open source deep learning library by Google. It was originally developed by Google's engineers who were working on Google Brain and has been used for research on machine learning and deep learning. Tensorflow at it's core is about computations of multidimensional arrays called tensors but what makes Tensorflow great is its ability to be flexible to deploy computations on different devices such as CPU's and GPU's

Keras

Keras is a high-level neural networks API, written in Python and capable of running on top of TensorFlow, CNTK, or Theano. It was developed with a focus on enabling fast experimentation. Keras contains numerous implementations of commonly used neural network building blocks suchas layers, objectives, activation functions, optimizers, and a host of tools to make working with image and text data easier. The code is hosted on GitHub, and community support forums include the GitHub issues page, and a Slack channel. Keras allows users to productize deep models on smartphones (iOS and Android), on the web, or on the Java Virtual Machine. It also allows use of distributed training of deep learning models on clusters of Graphics Processing Units (GPU).

Jupyter Notebook IDE:

The Anaconda distribution comes with a variety of software that includes Jupyter Notebooks for scientific computing. Jupyter Notebooks is an open source software IDE that allows developers to create and share documents that contain live code and more.

3. SYSTEM DESIGN

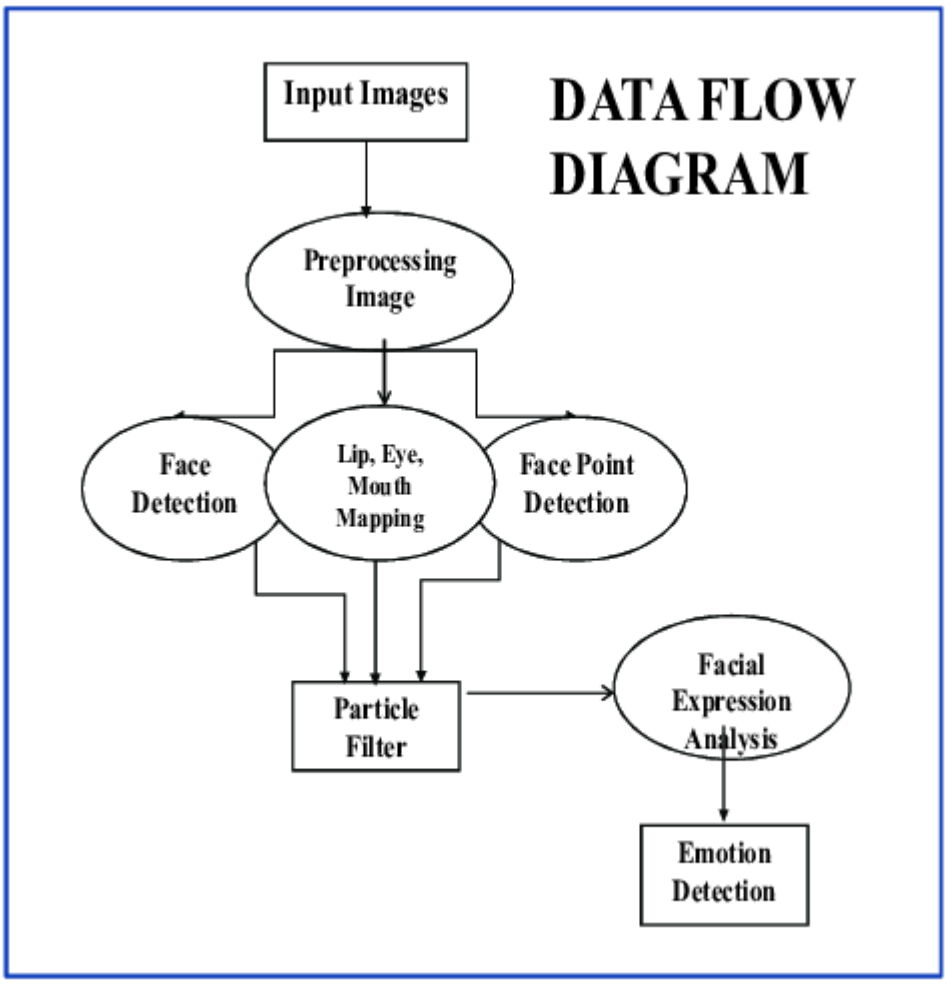
System design concentrates on moving from problem domain to solution domain. This important phase is composed of several steps. It provides the understanding and procedural details necessary for implementing the system recommended in the feasibility study. Emphasis is on translating the performance requirements into design specification. The design of any software involves mapping of the software requirements into Functional modules. Developing a real time application or any system utilities involves two processes. The first process is to design the system to implement it. The second is to construct the executable code. Software design is a first step in the development phase of the software life cycle.

Before design the system user requirements have been identified, information has been gathered to verify the problem and evaluate the existing system. A feasibility study has been conducted to review alternative solution and provide cost and benefit justification. To overcome this proposed system is recommended. At this point the design phase begins.

The process of design involves conceiving and planning out in the mind and making a drawing. In software design, there are three distinct activities.

Data Flow Diagram

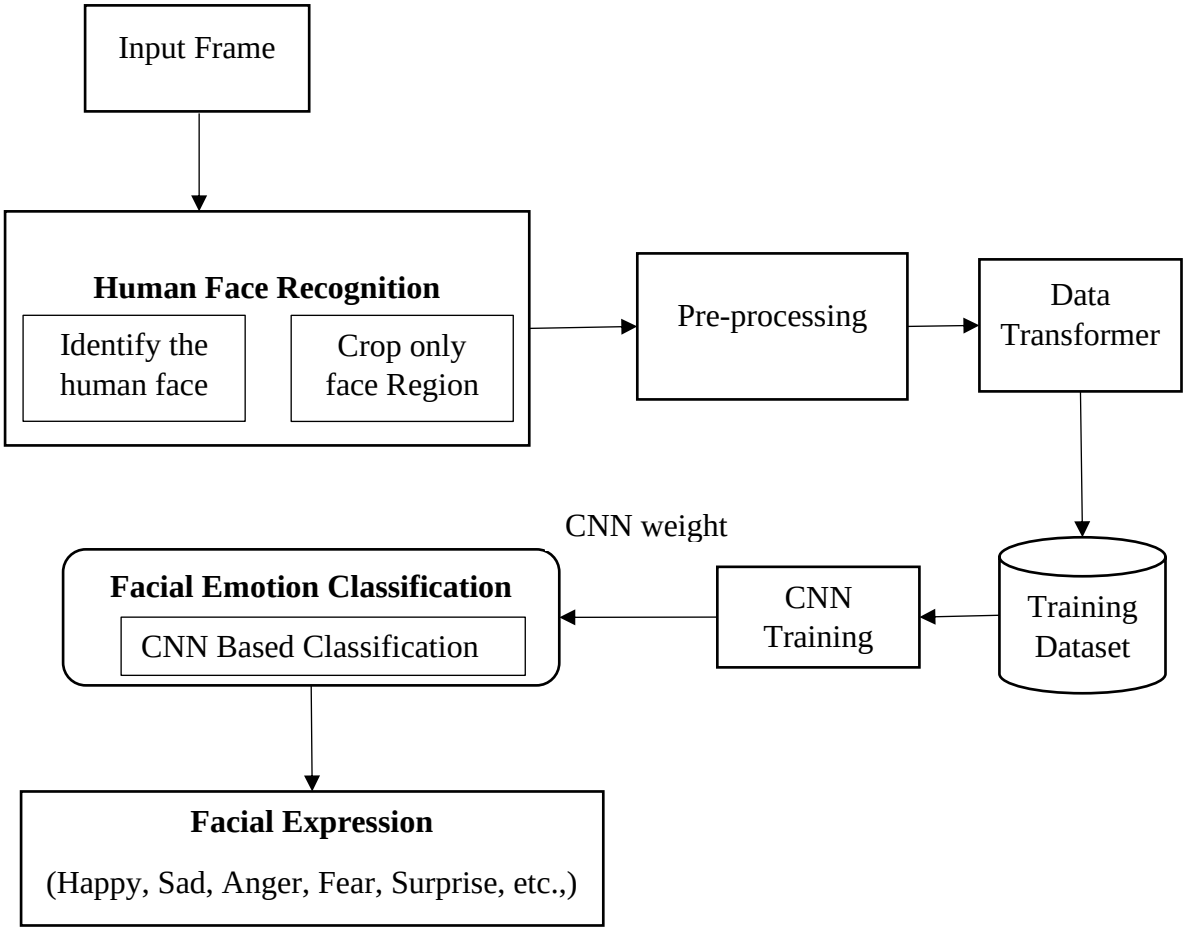
The Data Flow Diagram is a graphical model showing the inputs, processes, storage & outputs of a system procedure in structure analysis. A DFDis also known as a Bubble Chart. The Data flow diagram provides additional information that is used during the analysis of the information domain, and server as a basis for the modelling of functions. The description of each functionpresented in the DFD is contained is a process specification called as PSPEC.



Data Flow Diagram

System Architecture

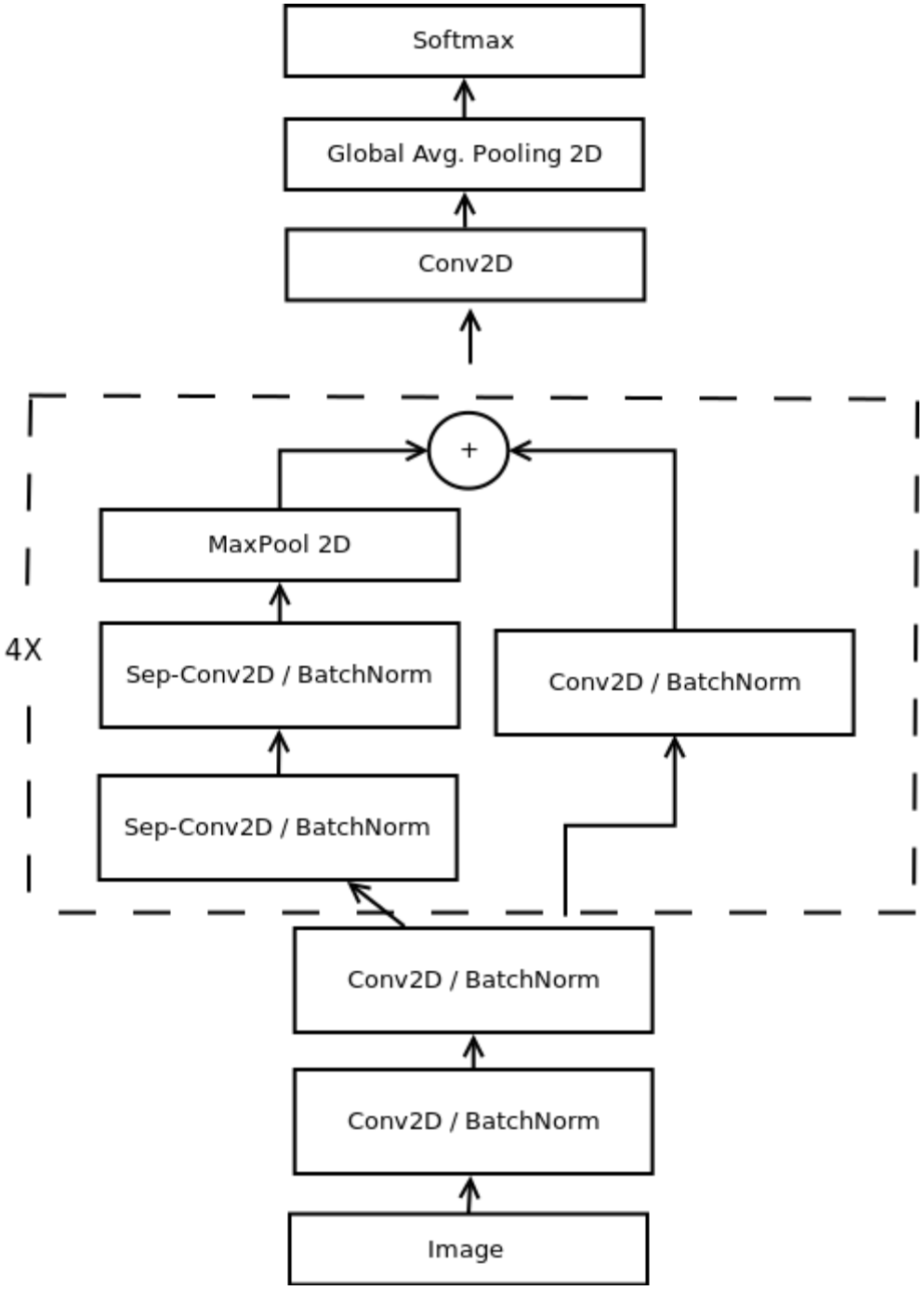
An architectural diagram is a diagram of a system that is used to abstract the overall outline of the software system and the relationships, constraints, and boundaries between components. It is an important tool as it provides an overall view of the physical deployment of the software system and its evolution roadmap.



System Architecture

USE CASE DIAGRAM

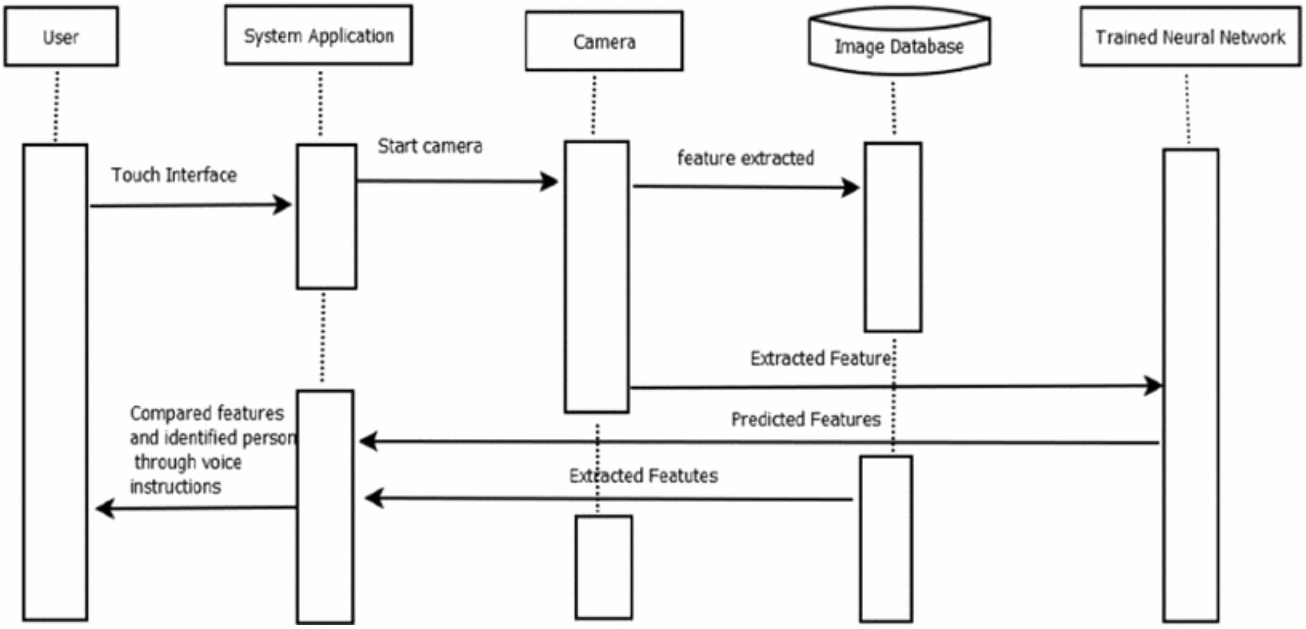
A use case diagram in the Unified Modeling Language (UML) is a typeof behavioral diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted.



Use Case Diagram

SEQUENCE DIAGRAM

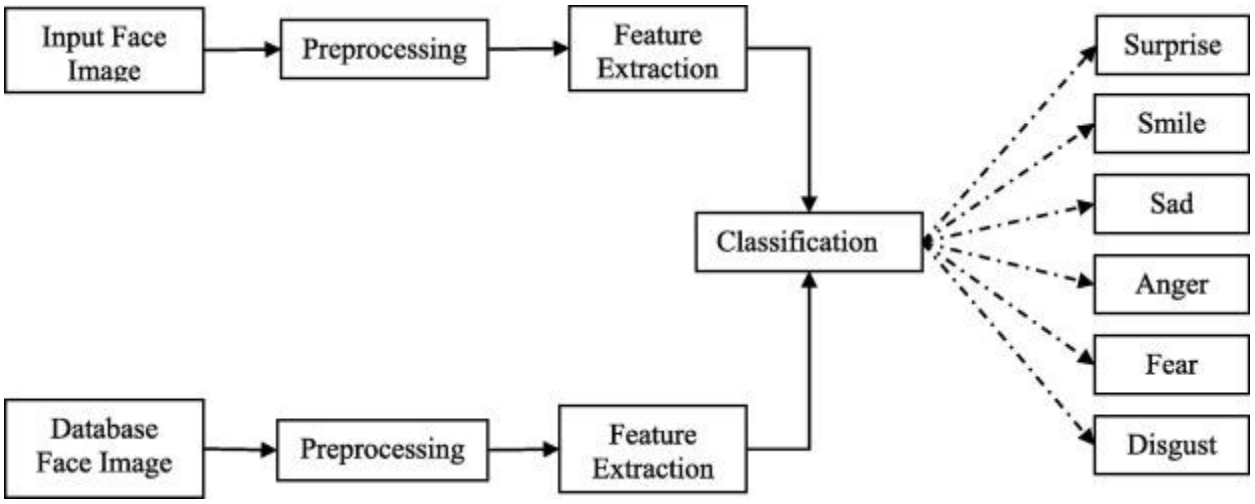
A sequence diagram in Unified Modelling Language (UML) is a kind of interaction diagram that shows how processes operate with one another and inwhat order. It is a construct of a Message Sequence Chart. Sequence diagramsare sometimes called event diagrams, event scenarios, and timing diagram.



Sequence Diagram

CLASS DIAGRAM

A class diagram in the Unified Modelling Language (UML) is a type of static structure diagram that describes the structure of a system by showingthe system's classes, their attributes, operations (or methods), and the relationships among objects.



Class Diagram

4. PROJECT DESCRIPTION

Design is concerned with identifying software components specifying relationship among components. Specifying software structure and providing blue print for the document phase. Modularity is one of the desirable properties of large systems.

Implementation is the stage of the project when the theoretical design is turned out into a working system. Thus it can be considered to be the most critical stage in achieving a successful new system and in giving user, confidence that the new system will work and be effective.

Phases in Facial Expression Recognition

The facial expression recognition system is trained using supervised learning approach in which it takes images of different facial expressions. The system includes the training and testing phase followed by image acquisition, face detection, image preprocessing, feature extraction and classification. Face detection and feature extraction are carried out from face images and then classified into six classes belonging to six basic expressions.

Image Acquisition

Images used for facial expression recognition are static images or image sequences. Images of face can be captured using camera.

Face detection

Face Detection is useful in detection of facial image. Face Detection is carried out in training dataset using Haar classifier called Voila-Jones face detector and implemented through Opencv. Haar like features encodes the difference in average intensity in different parts of the image and consists of black and white connected rectangles in which the value of the feature is the difference of sum of pixel values in black and white regions.

Image Pre-processing

Image pre-processing includes the removal of noise and normalization against the variation of pixel position or brightness.

a) Color Normalization

b) Histogram Normalization

Feature Extraction

Selection of the feature vector is the most important part in a pattern classification problem. The image of face after pre-processing is then used for extracting the important features. The inherent problems related to image classification include the scale, pose, 17 translation and variations in illumination level

5. MODULE DESCRIPTION

This project modules are

- Pre-processing
- CNN Model Construction
- CNN Training
- Face Expression Detection

Pre-processing

Image preprocessing is an important step for the image recognition task. In this work, face detection, rotation correction, image cropping and resizing. Specifically, rotation correction intends to ensure two eyes stay on the horizontal line. The cropping and resizing are performed vertically between eyebrows and jaw, horizontally between two ears. As a result, the preprocessed image has 48x48 pixels and contains expression-relevant facial organs.

CNN Construction

Compared with the spatial domain, some characteristics are more prominent in the frequency domain and easy to process, such as image noise and spatial redundancy. Hence, we can exploit these advantages for face analysis. In the meanwhile, image filter is computationally efficient in the frequency domain, and it can be realized by an element-wise multiplication. Therefore, we can utilize the element-wise multiplication to filter facial information for feature extraction. For example, a high-pass filter, which retains high frequency and discards low frequency, can generate a sharpened image. On the contrary, a low-pass filter, which preserves low frequency and discards high frequency, can produce a smoothed image. Filters in the frequency domain can be flexible, different kinds of which have various attributes and produce corresponding results. However, filtering images properly to extract useful features requires suitable filters that are difficult and time-consuming to be carried out manually. To generate a suitable filter efficiently, we propose the LMK which works a learnable image filter for feature extraction.

Summarization Layer

The summarization layer, which implements convolution and pooling in the frequency domain, is proposed to further yield high-level features. The design of the summarization layer is motivated as follows. Dimension reduction is important for a deep learning framework, which can reduce feature dimension and relieve computational burden. It can be also used for further feature extraction. So we decide to propose a dimension reduction technique following the multiplication layers for performance improvement. Pooling is a simple way to realize dimension reduction, which can reduce image resolution in spatial domain and has been widely used in CNN. But for frequency domain, pooling directly may lose image information. To effectively implement pooling in frequency domain, we first use the technique of local Perceptron. The local Perceptron utilized here is convolution, after which there are correlations between elements in each local region of the feature map. Therefore, information loss caused by pooling after convolution is much less than pooling directly. As mentioned in the previous section, a large number of convolutional kernels can cause huge computational costs. Therefore, only one convolutional layer is utilized here to construct the summarization layer.

The summarization layer is designed following the multiplication layers to further yield high-level features. The convolutional kernel works as the local Perceptron to improve the feature learned from the multiplication layer, which can be formulated as follow:

Output = Relu(conv(Input)),

where *Relu* is the rectified unit function. The stride of convolutional kernel is 1 to preserve more information. The pooling is used for dimension reduction and further feature extraction. Specifically, the max pooling is utilized here, because the large element represents low frequency which contains more information than the high frequency. In addition, this structure can increase the nonlinearity of our model to improve performance, and its output is used as the input of the classification layer.

Classification Layer

To classify features from the previous subsection for FER, we design the ANN-based classification layer. We utilize the fully connected layers to construct the classification layer. First, the input layer is used for the output of the summarization layer. Second, there are two hidden layers fully connected with the first layer and output layer. Specifically, the dropout technique is adopted on hidden layers to prevent from overfitting. Finally, the output layer is

a *sof tmax* layer *P Rc* where *c* is the number of the categories. The predicted label *y_* is defined as follow:

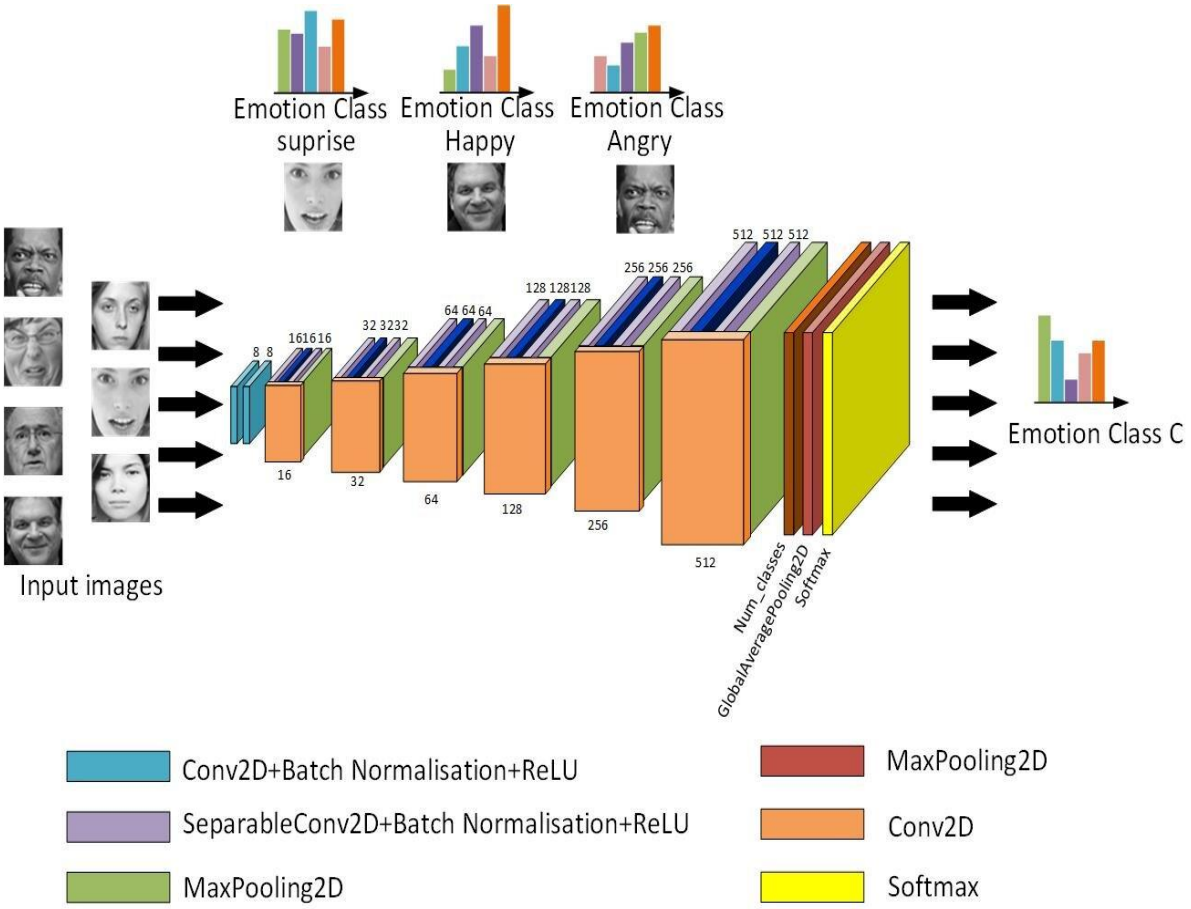
$$\acute{y} = argmaxi(Pi), 1 \leq i \leq c.$$

CNN Training

So far, we have introduced the structure of Basic-CNN and Block-CNN. They have a common framework as shown in Fig. 1, but the multiplication kernels and dimension reduction methods are different. For network training, the back propagation and stochastic optimization are employed to optimize the cross entropy loss function. Specifically, the variables to be trained include multiplication kernels, convolutional kernels, weights of fully connected layers and their corresponding biases.

Face Expression Detection

For facial image, image processing techniques such as gray processing, rotation correction and cropping are based on For Basic-CNN and Block- CNN, the implementation is based on Trained Model. For each model, we conduct one experiment on each dataset for six-expression recognition. All the implementations are based on the environment of Python 3.5 and the operating system of Windows using the GPU of GeForce GTX 1080 Ti with 11.00GB memory and the CPU of AMD Ryzen 7 2700X Eight-Core 3.70GHz. For facial image, image processing techniques such as gray processing, rotation correction and cropping are based on OpenCV(3.1.0) and Dlib(19.40). For Basic-CNN and Block- CNN, the implementation is based on Tensorflow(1.7.0). For each model, we conduct one experiment on each dataset for six-expression recognition. Moreover, we conduct seven-expression recognition on CK+ for comparison with existing methods. To obtain recognition accuracy on CK+, Oulu-CASIA and KDEF, the experiment is conducted with ten-fold cross-validation. Specifically, the dataset is divided into ten subject-independent groups as mentioned above. For each time, nine of ten folds are used for training, while the rest is used for testing, as previous researches did. The overall recognition accuracy is the average of seven groups.



Convolutional Neural Network

6. SYSTEM STUDY

EXISTING SYSTEM:

In existing work, presents a deep learning based approach, named Frequency neural network (FreNet), for facial expression recognition. Based on the property of Discrete cosine transform (DCT), it utilize multiplication layers and summarization layer to construct the Basic- FreNet, which can yield high-level features on the widely used DCT feature. Finally, to further achieve better performance on Basic- FreNet, it proposed the Block- FreNet in which the weight-shared multiplication kernel is designed for feature learning and the block sub-sampling is designed for dimension reduction. The experimental results show that the Block-FreNet not only achieves better performance.

Disadvantages

- High Computation cost is required for recognition.

- Requires more memory to store the Transformed frames.

PROPOSED SYSTEM

Our Proposed System, work presents a deep learning based approach, named frequency neural network (CNN), for facial expression recognition. Different from convolutional neural network in spatial domain, CNN inherits the advantages of processing image in frequency domain, such as efficient computation and spatial redundancy elimination. First, we propose the learnable multiplication kernel and construct multiple multiplication layers to learn features in frequency domain. Second, a summarization layer is proposed following multiplication layers to further yield high-level features. Third, based on the property of Scalar/Vector, we utilize multiplication layers and summarization layer to construct the Basic- , which can yield high-level features on the widely used Scalar/Vector feature. Finally, to further achieve better performance on Basic convolutional neural network, we propose the Block- convolutional neural network in which the weight-shared multiplication kernel is designed for feature learning and the block sub-sampling is designed for dimension reduction. The experimental results show that the Block- convolutional neural network not only achieves superior

performance, but also greatly reduces the computational cost. To our best knowledge, the proposed approach is the first attempt to fill in the blank of frequency based deep learning model for facial expression recognition.

Advantages

- Less Computation cost is required for recognition.
- Requires less memory to store the Transformed frames.
- Fast transformation of input frame

7. SYSTEM ANALYSIS

System analysis is the overall analysis of the system before implementation and for arriving at a precise solution. Careful analysis of a system before implementation prevents post implementation problems that might arise due to bad analysis of the problem statement. Thus the necessity for systems analysis is justified. Analysis is the first crucial step, detailed study of the various operations performed by a system and their relationships within and outside of the system. Analysis is defining the boundaries of the system thatwill be followed by design and implementation.

System Implementation

Implementation is the stage in the project where the theoretical design is turned into a working system. The implementation phase constructs, installs andoperates the new system. The most crucial stage in achieving a new successful system is that it will work efficiently and effectively.

There are several activities involved while implementing a new project.

- End user Training
- End user Education
- Training on the application software

All projects go through a life cycle beginning with defining how the new software package will be used in your organization (requirements) through the end point of the project – a successful and effective implementation. Our activities matrix has been organized around six generic implementation life cycle phases.

1. **Business Requirement and Proposed Solution** – this is the phase where your business requirements are finalized, the software package is learned, and a solution using the package is defined to meet the business requirements.

2. **High Level Design (Functional Specifications)** – the planned solution is further clarified by functionally specifying how the system will operate.

3. **System Implementation** – in this phase the system is implemented and operations are

converted to the new system.

4. Sy**stem Support and Maintenance** – this is the post implementation phase where the system is turned over to the normal support and maintenance process. Most organizations use a standard development life cycle that they use when building or customizing systems.

FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system isto be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are

- Economical Feasibility
- Technical Feasibility
- Social Feasibility

Economical Feasibility

This study is carried out to check the economic impact that the systemwill have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

Technical Feasibility

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing thissystem.

Social Feasibility

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to makehim familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

8. SYSTEM TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, subassemblies, assemblies and/or a finished product it is the process of exercising software withthe intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

Unit testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results. Unit testing is usually conducted as part of a combined code and unit test phase of the software lifecycle, although it is not uncommon for coding and unit testing to be conducted as two distinct phases.

Alpha testing

Alpha testing is the first stage of software engineering which is considered as a simulated or actual operational testing done by the individual member of the project. Alpha testing is conducted by the project developers, in context of our project.

Beta Testing

Beta testing comes continuously after alpha testing which is considered as a form of external user acceptance testing. The beta version of the program is developed to and provided

to limited audience. This is the final test process in the case of this project. In this system the beta-testing is done by our colleagues and the project supervisor.

Test strategy and approach

Field testing will be performed manually and functional tests will bewritten in detail.

Test objectives

- All field entries must work properly.
- Pages must be activated from the identified link.
- The entry screen, messages and responses must not be delayed.

Features to be tested

- Verify that the entries are of the correct format
- No duplicate entries should be allowed
- All links should take the user to the correct page.

Integration testing

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components. Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects.

The task of the integration test is to check that components or software applications, e.g. components in a software system or one step up software applications at the company level interact without error.

Test Results

All the test cases mentioned above passed successfully. No defects encountered.

Acceptance Testing

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

Test Results

All the test cases mentioned above passed successfully. No defects encountered.

Functional test

Functional tests provide systematic demonstrations that functions testedare available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is cantered on the following items:

- Valid Input : identified classes of valid inputmust be accepted.
- Invalid Input : identified classes of invalid inputmust be rejected.
- Functions : identified functions must be exercised.
- Output : identified classes of application outputs must be exercised.
- Systems/Procedures : interfacing systems or proceduresmust be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing.

System Test

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

White Box Texting

White Box Testing is a testing in which in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It is purpose. It is used to test areas that cannot be reachedfrom a black box level.

Black Box Testing

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a testing in which the software under test is treated, as a black box .you cannot “see” into it. The test provides inputs and responds to outputs without considering how the software works

9. CODE DESIGN

train.py

```
import numpy as np

import cv2

from keras.models import Sequential

from keras.layers import Dense, Dropout, Flatten

from keras.layers import Conv2D

from keras.optimizers import Adam

from keras.layers import MaxPooling2D

from keras.preprocessing.image import ImageDataGenerator

train_dir = 'Data/train'

val_dir = 'Data/test'

train_datagen = ImageDataGenerator(rescale=1./255)

val_datagen = ImageDataGenerator(rescale=1./255)

#emoji_dist={0:"emojis/angry.png",1:"emojis/disgusted.png",2:"emojis/fearful.png",3:"emoji
s/happy.png",4:"emojis/neutral.png",5:"emojis/sad.png",6:"emojis/surpriced.png"}

train_generator = train_datagen.flow_from_directory(

train_dir,

target_size=(48,48),

batch_size=64,

color_mode="grayscale",

class_mode='categorical')

validation_generator = val_datagen.flow_from_directory(

val_dir,

target_size=(48,48),
```

```
batch_size=64,

color_mode="grayscale",

class_mode='categorical')

emotion_model = Sequential()

emotion_model.add(Conv2D(32, kernel_size=(3, 3), activation='relu', input_shape=(48,48,1)))

emotion_model.add(Conv2D(64, kernel_size=(3, 3), activation='relu'))

emotion_model.add(MaxPooling2D(pool_size=(2, 2)))

emotion_model.add(Dropout(0.25))

emotion_model.add(Conv2D(128, kernel_size=(3, 3), activation='relu'))

emotion_model.add(MaxPooling2D(pool_size=(2, 2)))

emotion_model.add(Conv2D(128, kernel_size=(3, 3), activation='relu'))

emotion_model.add(MaxPooling2D(pool_size=(2, 2)))

emotion_model.add(Dropout(0.25))

emotion_model.add(Flatten())

emotion_model.add(Dense(1024, activation='relu'))

emotion_model.add(Dropout(0.5))

emotion_model.add(Dense(7, activation='softmax'))

emotion_model.load_weights('emotion_model.h5')

#

#cv2.ocl.setUseOpenCL(False)

#

#emotion_dict = {0: "Angry", 1: "Disgusted", 2: "Fearful", 3: "Happy", 4: "Neutral", 5: "Sad", 6: "Surprised"}

emotion_model.summary()
```

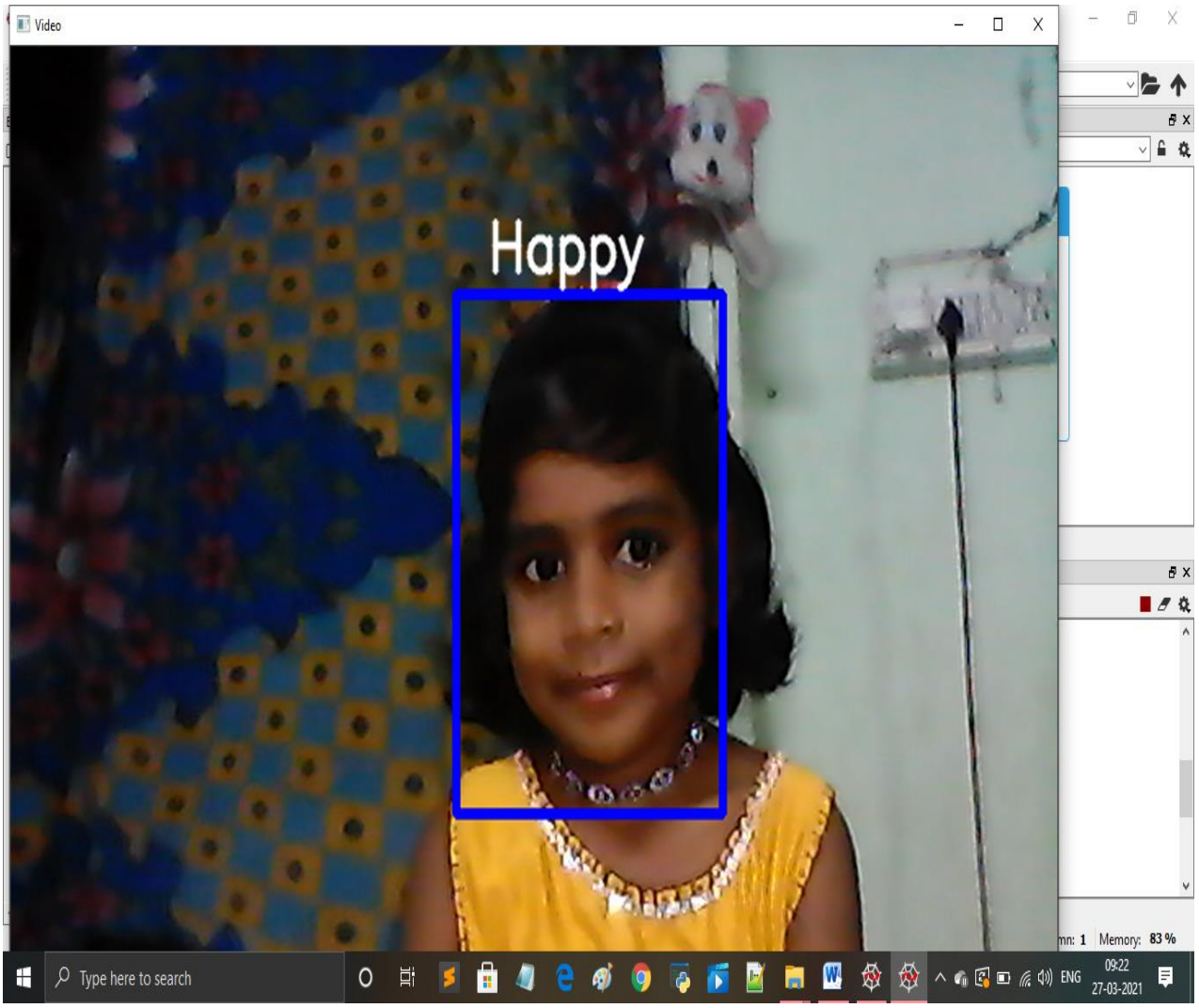
```
emotion_model.compile(loss='categorical_crossentropy',optimizer=Adam(lr=0.0001,
decay=1e-6),metrics=['accuracy'])

#emotion_model_info = emotion_model.fit_generator(

#        train_generator,

#        steps_per_epoch=28704 //64,

#        epochs=3,

#        validation_data=validation_generator,

#        validation_steps=7178 // 64)

emotion_model.save_weights('emotion_model.h5')

cv2.ocl.setUseOpenCL(False)

emotion_dict = {0: "Angry", 1: "Disgusted", 2: "Fearful", 3: "Happy", 4: "Neutral", 5: "Sad",
6: "Surprised"}

#src = cv2.imread('D:\Datascience\Emojis')

#start the webcam feed

cap = cv2.VideoCapture(0)

while True:

ret, frame = cap.read()

if not ret:

break

bounding_box = cv2.CascadeClassifier('haarcascade_frontalface_default.xml')

img = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)

num_faces = bounding_box.detectMultiScale(img,1.3,3)

for (x, y, w, h) in num_faces:

cv2.rectangle(frame, (x, y-50), (x+w, y+h+10), (255, 0, 0), 3)
```

```
roi_gray_frame = img[y:y + h, x:x + w]

cropped_img = np.expand_dims(np.expand_dims(cv2.resize(roi_gray_frame, (48, 48)), -1), 0)

emotion_prediction = emotion_model.predict(cropped_img)

maxindex = int(np.argmax(emotion_prediction))

cv2.putText(frame, emotion_dict[maxindex], (x+20, y-60), cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 255), 2, cv2.LINE_AA)

cv2.imshow('Video', cv2.resize(frame,(1200,860),interpolation = cv2.INTER_CUBIC))

if cv2.waitKey(1) & 0xFF == ord('q'):

cap.release()

cv2.destroyAllWindows()

break

#import tkinter as tk

#from tkinter import filedialog

#from tensorflow.keras.preprocessing import image

#import os

#

#

#application_window = tk.Tk()

#

#my_filetypes = [('all files', '.*'), ('text files', '.txt')]

#

#img=filedialog.askopenfilename(parent=application_window,

#                               initialdir=os.getcwd(),

#                               title="Please select a file:",

#                               filetypes=my_filetypes)
```

```
#img = image.load_img(img, target_size=(48,48),color_mode="grayscale")
#
#
#img_array = image.img_to_array(img)
#img_batch = np.expand_dims(img_array,axis=0)
#img_batch =img_batch/255
#pre=emotion_model.predict(img_batch)
#import matplotlib.pyplot as plt
#plt.imshow(img,cmap="gray")
#predicted_classes = np.argmax((pre),axis=1)
#
#print("predicted Result:",predicted_classes)
#Base=os.path.abspath('Data/test')
#BT=os.listdir(Base)
#print("predicted Result:",BT[predicted_classes[0]])
#application_window.destroy()
```

10. SCREENSHOTS

HAPPY:



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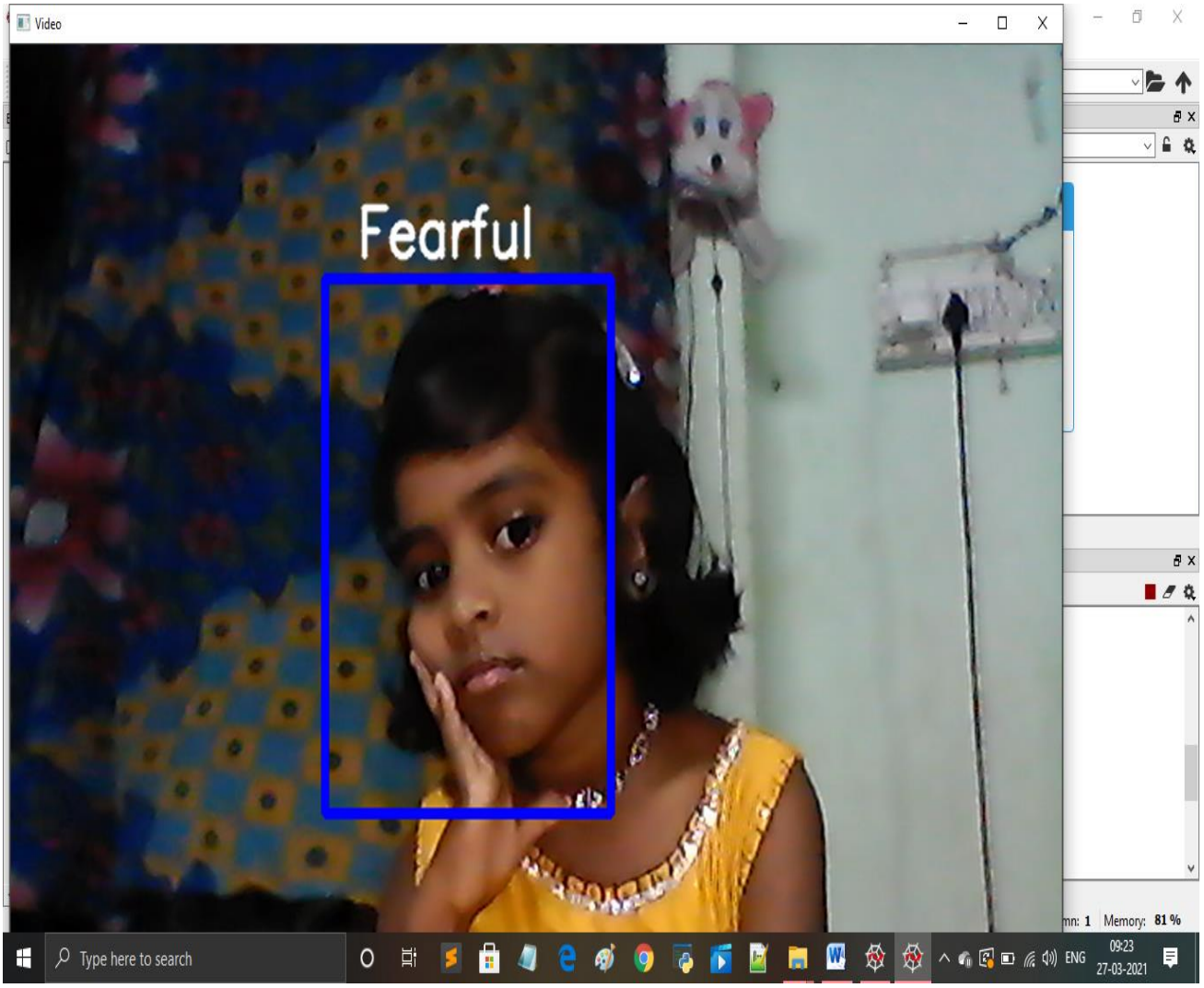
Video
Fearful
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ENG
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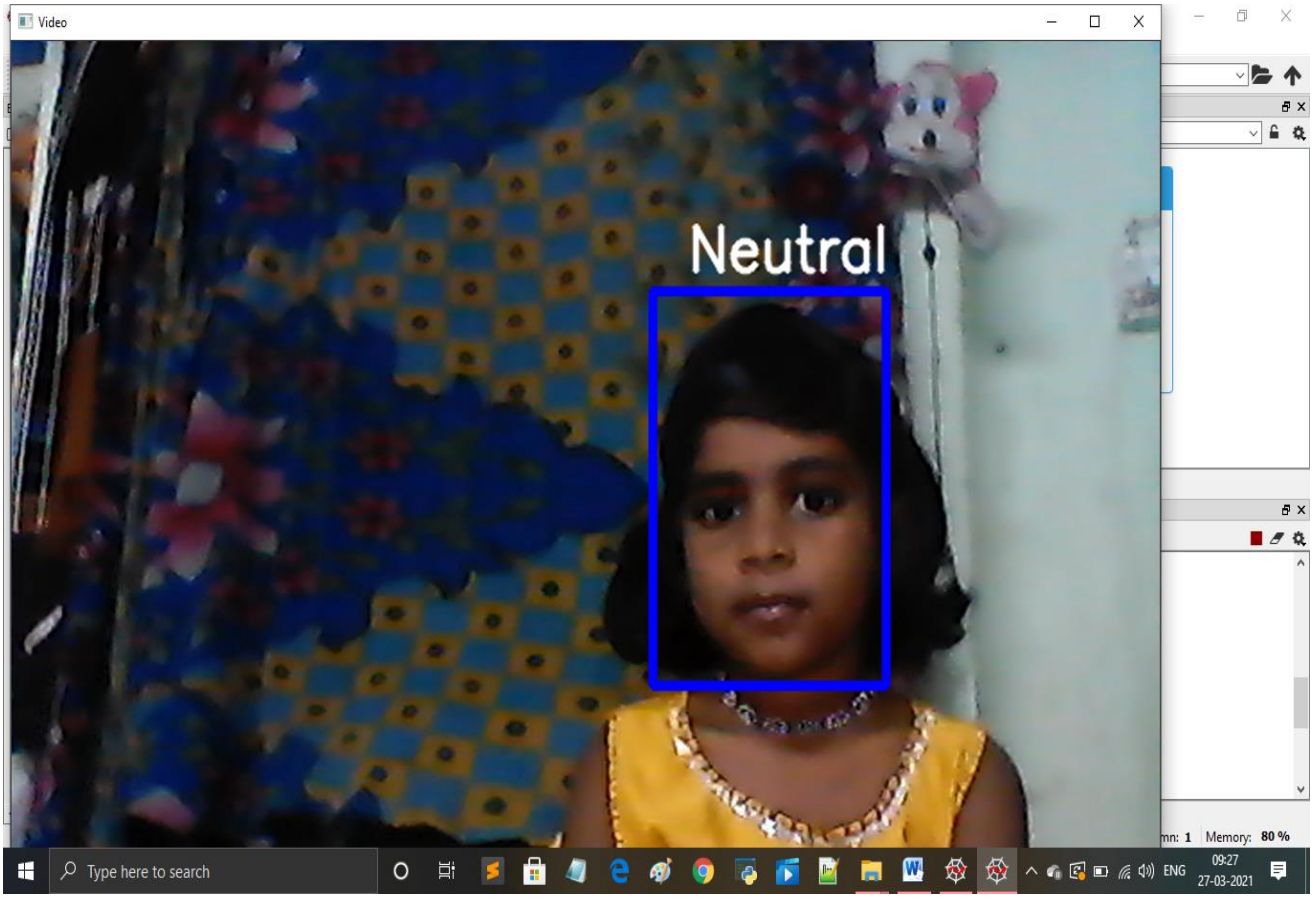
NEUTRAL: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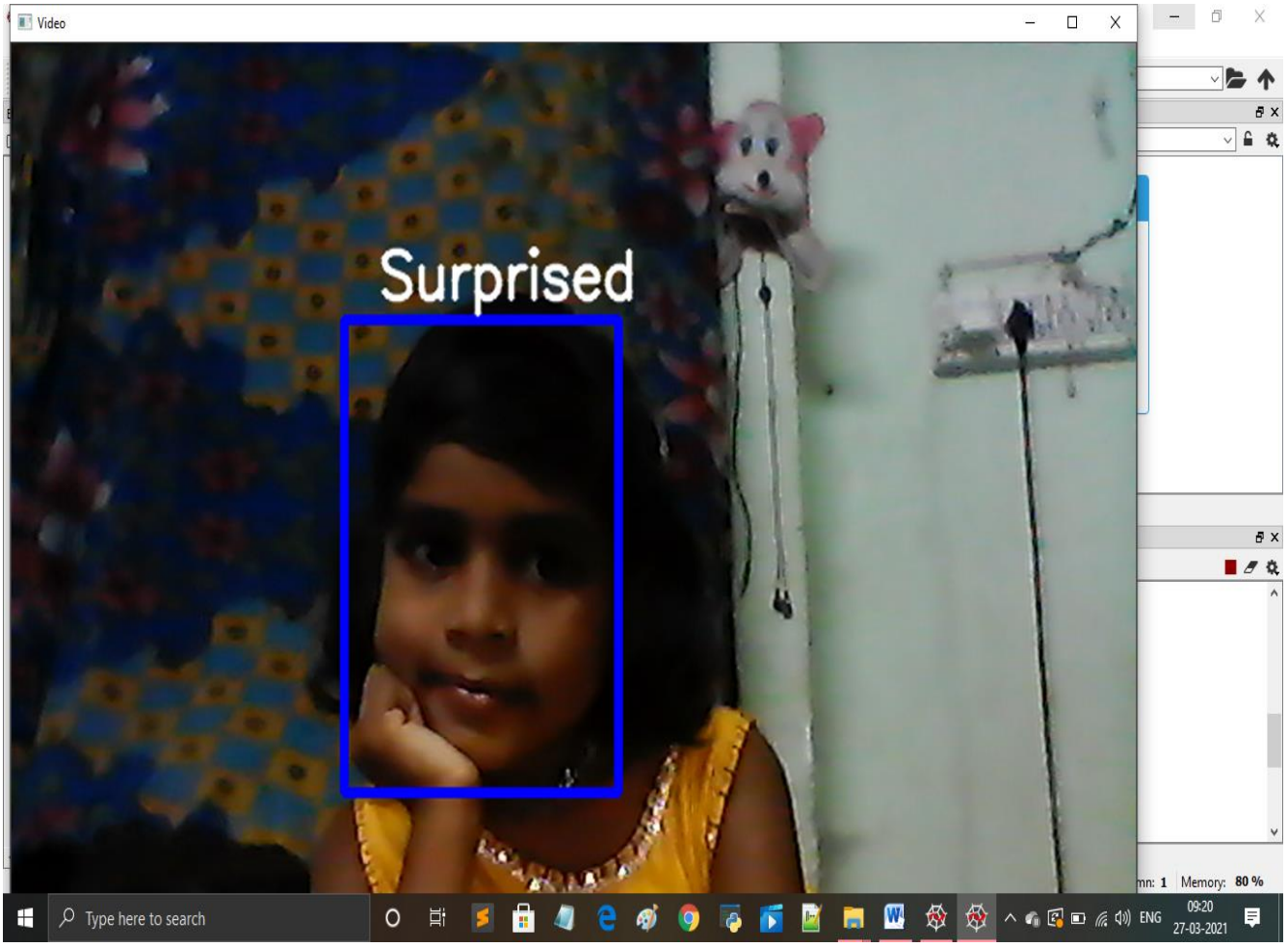
SURPRISED:


Video
Surprised
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ENG
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27-03-2021
Memory: 80 %

11. CONCLUSION

This project proposes an approach for recognizing the category of facial expressions. Face Detection and Extraction of expressions from facial images is useful in many applications, such as robotics vision, video surveillance, digital cameras, security and human-computer interaction. This project's objective was to develop a facial expression recognition system implementing the computer visions and enhancing the advanced feature extraction and classification in face expression recognition.

This project proposes a novel deep learning study convolutional neural network for FER. Based on the characteristic of convolutional neural network and construct multiplication layers for feature learning. In this project summarization layer to further yield high-level features. Based on the proposed techniques, first utilize the energy compaction property of Scalar/Vector and construct the Basic-CNN and the weight-shared CNN for feature learning and the BSS for dimension reduction in frequency domain to construct the Block-CNN. The results of FER show that our models have the ability of learning features in frequency domain and predicting facial expression. Furthermore, the ablation study and parameter analysis demonstrate the effectiveness of the proposed techniques. The comparisons with other state-of-the-art methods show that our CNNs provide promising per.

12. FUTURE ENHANCEMENT

- Having examined techniques to cope with expression variation, in future it may be investigated in more depth about the face classification problem and optimal fusion of color and depth information.
- Further study can be laid down in the direction of allele of gene matching to the geometric factors of the facial expressions.
- The genetic property evolution framework for facial expressional system can be studied to suit the requirement of different security models such as criminal detection, governmental confidential security breaches etc.

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CRUDE OIL PRICE PREDICTION

A project submitted to

ST.MARY'S COLLEGE (Autonomous), THOOTHUKUDI

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

In partial fulfilment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

SANTHANALAKSHMI.B

Reg.No.:20SPCS20

Under the Supervision and Guidance of

Ms. C. NAYANTHRA MASCARENHAS M.Sc.,M.Phil.,SET

PG DEPARTMENT OF COMPUTER SCIENCE(SSC)

St.Mary's College (Autonomous),Thoothukudi-628001

May-2022

CERTIFICATE

This is to certify that this project work entitled **"CRUDE OIL PRICE PREDICTION"** is submitted to St. Mary's college (Autonomous) , Thoothukudi affiliated to **Manonmaniam Sundaranar University, Thirunelveli**, in partial fulfilment for the award of the degree of Master of Science in **Computer Science** for the work done during the year 2021-2022 by **B.SANTHANALAKSHMI (Reg.No.: 20SPCS20).**

Signature of the Guide **Signature of the Co-ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do here by declare that, The project entitled "CRUDE OIL PRICE PREDICTION" submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of Ms.C.Nayanthra Mascarenhas M.Sc., M.Phil., SET, Assistant Professor and Co-ordinator, PG Department of Computer Science (SSC), St. Mary's College (Autonomous), Thoothukudi.

Station: Thoothukudi **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to **Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D. ,** Principal, **Rev. Sr. Flora Mary,** Secretary, **Sr. S. Josephine Jeyarani , Director of SSC**, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I express my hearty thanks to my guide **Ms. C. Nayanthra Mascarenhas M.Sc., M.Phil., SET.,** Assistant Professor and Coordinator, PG Department of Computer Science (SSC) for her valuable suggestions, gentle guidance, enthusiastic ideas and support throughout my project, which helps me to carry out and complete my work effortlessly.

I also express my boundless thanks to **Ms. A. Jenitta Jebamalar M.Sc. (IT), M.Sc. (CS), M.Phil., B.Ed.**, Assistant Professor, PG Department of Computer Science (SSC) and

Dr.A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC) for her encouragement and support.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

ABSTRACT

The international crude oil market plays an important role in the global economy. This Project uses a variable time window and the polynomial decomposition method to define the trend term of time series and proposes a crude oil price forecasting method based on time-varying trend decomposition to describe the changes in trends over time and forecast crude oil prices. First, to characterize the time-varying characteristics of crude oil price trends, the basic concepts of post-position intervals, pre-position intervals and time-varying windows are defined. Second, a crude oil price series is decomposed with a time-varying window to determine the best fitting results. The parameter vector is used as a time-varying trend. Then, to quantitatively describe the continuation of the time-varying trend, the concept of the trend threshold is defined, and a corresponding algorithm for selecting the trend threshold is given. Finally, through the predicted trend thresholds, the historical reference data are selected, and the time-varying trend is combined to complete the crude oil price forecast.

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INTRODUCTION

Price forecasting is predicting a commodity/product/service price by evaluating various factors like its characteristics, demand, seasonal trends, other commodities prices (i.e. fuel), offers from numerous suppliers, etc .The predictions are based on our deep learning analysis. The models are used to forecast crude oil price and then produce a probabilistic prediction for it . The probabilistic prediction is actually generated by running Time series analyses on annual WTI average prices.

Except for the influence factors, researchers are also very concerned about the forecast methods for improving forecast accuracy. The four main forecast method categories: time series models, econometric models, qualitative methods and artificial intelligence techniques are used in oil price modeling and forecasting

Data mining is a process of extracting and discovering patterns in large data sets involving methods at the intersection of machine learning, statistics, and database systems. Data mining is an interdisciplinary subfield of computer science and statistics with an overall goal to extract information (with intelligent methods) from a data set and transform the information into a comprehensible structure for further use. Data mining is the analysis step of the "knowledge discovery in databases" process, or KDD.

The difference between data analysis and data mining is that data analysis is used to test models and hypotheses on the dataset, e.g., analyzing the effectiveness of a marketing campaign, regardless of the amount of data; in contrast, data mining uses machine learning and statistical models to uncover clandestine or hidden patterns in a large volume of data.

Process

The knowledge discovery in databases (KDD) process is commonly defined with the stages:

- Selection
- Pre-processing
- Transformation
- Data mining

- Interpretation/evaluation.

Stock market prediction

Stock market prediction is the act of trying to determine the future value of a company stock or other financial instrument traded on an exchange. The successful prediction of a stock's future price could yield significant profit. The efficient-market hypothesis suggests that stock prices reflect all currently available information and any price changes that are not based on newly revealed information thus are inherently unpredictable. Others disagree and those with this viewpoint possess myriad methods and technologies which purportedly allow them to gain future price information.

Intrinsic value (true value) is the perceived or calculated value of a company, including tangible and intangible factors, using fundamental analysis. It's also frequently called fundamental value. It is used for comparison with the company's market value and finding out whether the company is undervalued on the stock market or not. When calculating it, the investor looks at both the qualitative and quantitative aspects of the business. It is ordinarily calculated by summing the discounted future income generated by the asset to obtain the present value.

Time series aspect structuring

Aspect structuring, also referred to as Jacaruso Aspect Structuring (JAS) is a trend forecasting method which has been shown to be valid for anticipating trend changes on various stock market and geopolitical time series datasets. The method addresses the challenge that arises with high dimensional data in which exogenous variables are too numerous or immeasurable to be accounted for and used to make a forecast. The method identifies the single variable of primary influence on the time series, or "primary factor", and observes trend changes that occur during times of decreased significance in the said primary variable. Presumably, trend changes in these instances are instead due to so-called "background factors". Although this method cannot elucidate the multivariate nature of background factors, it can gauge the effects they have on the time-series at a given point in time even without measuring them. This observation can be used to make a forecast.

SYSTEM ANALYSIS

Introduction

System analysis is the study of sets of interaction entities including computer system analysis. This field is closely related to requirements analysis. Its is closely related to requirement analysis. System analysis consists of problem definition, existing system, proposed system, system requirements and software description. The problem can be defined in problem definition.

EXISTING SYSTEM

In an existing system, an artificial intelligent approach to predicting crude oil price is presented. Decision Trees (DT) are utilized in the modeling and prediction of crude oil from a dataset covering 24 years. The input attributes to the decision tree are key economic indicators that are believed to affect crude oil price and the system has as it's output the numerical value of the predicted crude oil price. Different DT algorithms like Decision stump, Random forest, Random tree amongst others are investigated and a performance analysis is performed between the investigated algorithms.

Drawbacks of Existing system:

1. A small change in the data can cause a large change in the structure of the decision tree causing instability.
2. For a Decision tree sometimes calculation can go far more complex compared to other algorithms.
3. Decision tree often involves higher time to train the model.
4. Decision tree training is relatively expensive as the complexity and time has taken are more.
5. The Decision Tree algorithm is inadequate for applying regression and predicting continuous values.

PROPOSED SYSTEM

The proposed time-varying trends provides a new method for researchers to analyses the trends of time series, thereby resolving the limitation of using fixed-length time windows in traditional methods; moreover, we define time-varying trends by defining the time-varying window. The trend of time series sample points is characterized by different optimal time window fitting parameters. In addition, our model has a good ability to express the historical trend of Brent and WTI(West Texas Intermediate) oil spot prices; hence, the time series trend is more scientifically described and thus more realistic. The presentation of the trend thresholds acknowledges that the data used for the prediction are not perfect, but historical data need to be selected according to the trend characteristics of each point. In addition, the trend thresholds are defined according to the overshoot phenomenon of polynomial functions; therefore, the predicted trend thresholds are obtained by a rolling prediction, and the historical data used for the prediction are determined in combination with a preseted controllable range.

Advantages:

- The investors can use WTI's time-varying trends to predict future Brent's time-varying trends according to the significant lag in the fifth component of the time-varying trend.
- If investors can correctly grasp the value brought by the trend threshold, it will help investors to accurately control the crude oil market and adjust their investment strategies in time.
- The TV-TD model has a good prediction ability in a specific time period, and this ability is significantly improved.

SYSTEM REQUIREMENTS

HARDWARE SPECIFICATION:

Hardware support the PC with the below mentioned configuration.

Processor **:** Pentium (2.10 GHz)

Ram **:** 2.00 GB

System type **:** 64 bit

SOFTWARE SPECIFICATION:

Software specifications for the system are detailed as follows:

Tool **:** NetBeans 8.2

Language **:** JAVA

Domain **:** Data mining

Operating System **:** Windows 7

Documentation **:** MS Word

SOFTWARE DESCRIPTIONS:

JAVA

When we consider a Java program, it can be defined as a collection of objects that communicate via invoking each other's methods. Let us now briefly look into what do class, object, methods, and instance variables mean.

Object - Objects have states and behaviors. Example: A dog has states - color, name, breed as well as behavior such as wagging their tail, barking, eating. An object is an instance of a class.

Class - A class can be defined as a template/blueprint that describes the behavior/state that the object of its type supports.

Methods - A method is basically a behavior. A class can contain many methods.

It is in methods where the logics are written, data is manipulated and all the actions are executed. Instance Variables - Each object has its unique set of instance variables. An object's state is created by the values assigned to these instance variables.

Structure of a Java class

A class is a blueprint for a discrete entity (object) that contains attributes and behavior. The class defines the object's basic structure; at runtime, your application creates an instance of the object. An object has a well-defined boundary and a state, and it can do things when correctly asked.

Packaging classes

A Java package is a mechanism for providing *a* namespace— an area inside of which names are unique, but outside of which they might not be. To identify a construct uniquely, you must fully qualify it by including its namespace.

Packages also give you a nice way to build more-complex applications with discrete units of functionality.To define a package, use the package keyword followed by a legal package name, ending with a semicolon.

Import statements

An import statement tells the Java compiler where to find classes that you reference inside of your code. Any nontrivial class uses other classes for some functionality, and the import statement is how you tell the Java compiler about them.

Class declaration

To define an object in the Java language, you must declare a class. Think of a class as a template for an object, like a cookie cutter.

Variables and methods

Classes can have two types of members—variables and methods.

***1*.Variables**

The values of a class's variables distinguish each instance of that class and define its state. These values are often referred to as instance variables. A variable has:

- An accessSpecifier
- A dataType
- A variableName
- Optionally, an initialValue

The possible accessSpecifier values are:

- public: Any object in any package can see the variable. (Don't ever use this value; see the Public variables sidebar.)

- protected: Any object defined in the same package, or a subclass (defined in any package), can see the variable.
- No specifier (also called friendly or package private access): Only objects whose classes are defined in the same package can see the variable.
- private: Only the class containing the variable can see it.

A variable's dataType depends on what the variable is it might be a primitive type or another class type (more about this later).

2. Methods

A class's methods define its behavior.Methods fall into two main categories: constructors; and all other methods, which come in many types. A constructor method is used only to create an instance of a class. Other types of methods can be used for virtually any application behavior.

- accessSpecifier
- returnType
- methodName
- argumentList

Static and instance methods

Generally, two types of (nonconstructor) methods are used: instance methods and static methods.

Instance methods depend on the state of a specific object instance for their behavior. Static methods are also sometimes called class methods, because their behavior isn't dependent on any single object's state. A static method's behavior happens at the class level.

Static methods are used largely for utility; you can think of them as being global methods while keeping the code for the method with the class that defines it.

SYSTEM STUDY

FEASIBILITY STUDY:

The feasibility of the project is analysed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. Three key considerations involved in the feasibility analysis are,

- Economical Feasibility
- Technical Feasibility
- Social Feasibility

Economical Feasibility:

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

Technical Feasibility:

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources. This will lead to high demands being placed on the client.

Social Feasibility:

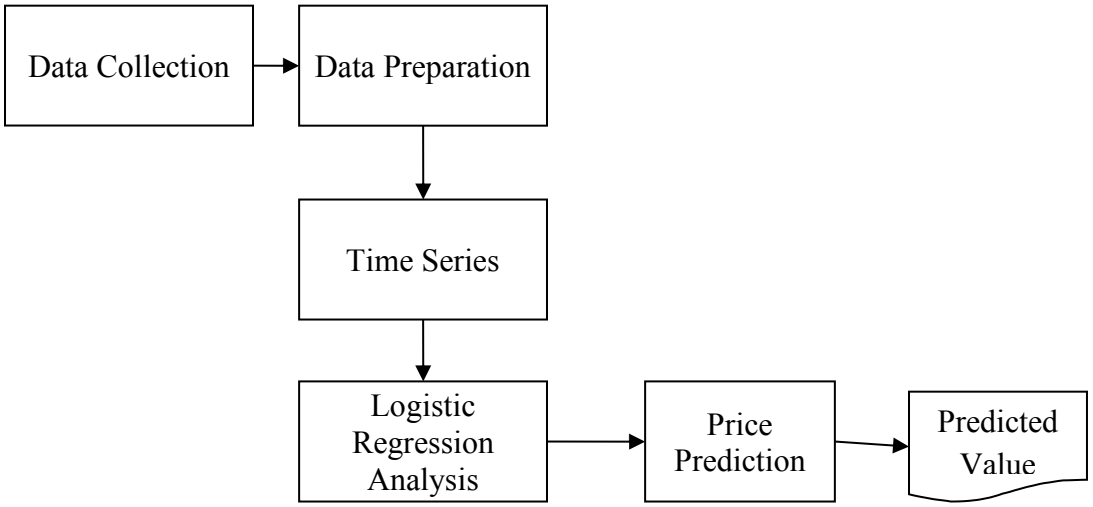
The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it.

SYSTEM DESIGN

INTRODUCTION:

System implementation is the process of defining the architecture, components, features, feature extractions with output.

SYSTEM ARCHITECTURE:



MODULES

- Data Preparation
- Time series
- Logistic Regression Analysis
- Price Prediction

MODULE DESCRIPTION

Data Preparation

The data utilized with the DT models was obtained from the website. On this website, WTI weekly prices from 20th of May 1987 through to 25th January 2021 are extracted and the aim is to model and predict these weekly oil prices. A multi input single output approach is deployed. Thus, we denote key factors that we believe affect crude oil price. These factors serve as the input attributes to the DT with the weekly crude oil price (a numerical value) serving as the output.

A brief description of utilized input attributes and the data coding used is given below:

1. **Date**:

This is varies from 1 to 24 (year 1987- year 2021).

2. **Price of oil:**

This attribute measures the effect of externalities on the price of crude oil. This value ranges from 0.1 to 0.5 where 0.5 represents an event with a huge impact on crude oil price whilst 0.1 represents an event with little impact. future contract prices: suggested that future prices are related to the WTI spot prices. It is on tis basis, that this attribute is included in our model.

Time series

The rising and falling state of a time series sample point is determined by the relationship between the selected sample point and its context data. For the same sample point, selecting different time windows will show different trends. Therefore, to characterize the different trends exhibited by the differences in the selected time windows, we first give the following definitions.

Definition : For the time-varying window [ta, tb] of the sample point Yt, let aYt (ta) = ta + t; then, call aYt (ta) the post-position of the sample point Yt. In addition, let $b_{Y_t}(t_b) = t_b - t_i$; then, call bYt (tb) the pre-position Y_t It is important to note that for a given time t, aYt (ta) is a function of ta, and bYt (tb) is a function of tb. Therefore, the time-varying window represents all possible

intervals containing the time t, and the most suitable time-varying window for the sample point Yt at each moment is not necessarily the same. In Definitions 1 and 2, LIt can reflect the influence of historical information on Yt, and PIt can reflect the impact of Yt on future data.

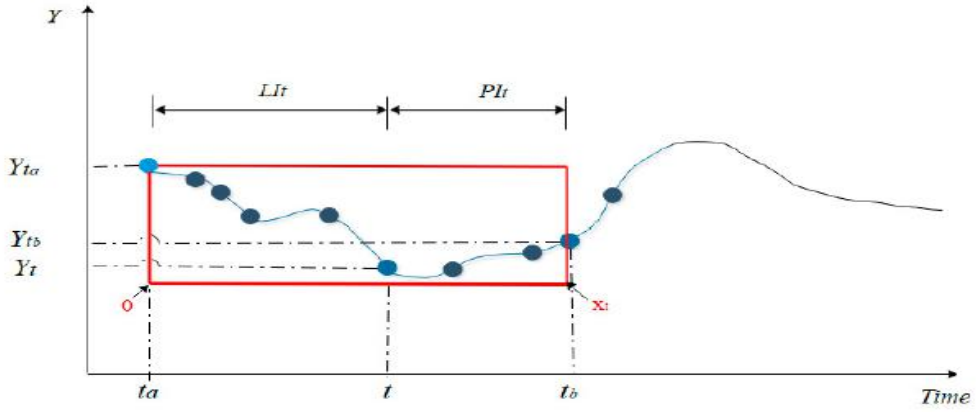


Figure 2. Time-varying window representation of time series sample points.

In financial time series, there are different trend changes for all subsequences contained in a time window of different sample points. Moreover, the closer the sample point is to the trend, the greater the influence on the trend of the point. Although we cannot accurately describe an overall sequence with a single function, the sub sequences within each time window can be described by different fitting functions. We call the coefficients used to fit the fitting functions of the sub sequences in the time window the trends of the sub sequences on this time window. However, although the trends of the sub sequences on the time window have been described, since there are many kinds of time windows for each point, the way in which they can be described is not unique, and thus, we have a limited time variation from this point. In the time window, we find the optimal fitting function for the subsequence containing this point and the time window corresponding to the best fit. At this time, the coefficients and time window of the optimal fit function are referred to as the time-varying trend of the sample points. On the time-varying window [ta, tb] of the time series sample point Yt, there is a fitting function f (x) x 2 [0, ta +tb] such that f (x) has the best fitting e_ect on the time-varying window. Then, the vector formed by the coefficient vector #t = (_t,0, _t,1, _ _ _)T of the coefficients of the optimal fitting function f (x) and the corresponding time window Wt is the time-varying trend of the time series sample point Yt, represented by the symbol Tt. It is easy to find that Tt = (#t,Wt)T = (_t,0, _t,1, _ _ _ ,

aYt (ta0), bYt (tb0))T, where ta0 , tb0 are the time-varying window endpoints corresponding to the optimal fit.

Time Varying Trend Construction algorithm

1. Input: Time series, search space for fitted polynomials $S = \{f_1, f_2, \cdots, f_n\}, n \in N$, search space for time-varying window.
2. Output: Time-varying trend of time series sample point Y_t.
3. Step 1: Use different degree polynomials in S to fit the sample points on the selected window $[t_a, t_b]$ to get different sets of coefficients and errors, and choose a set of coefficients with the smallest error.
4. Step 2: Traverse all windows in the search space and restore the resulting polynomial fitting parameters with time-varying windows. According to the formula $\hat{Y}_t = \sum_{i=0}^{n} \theta_{t,i} x_t^i$ obtain the fitting value $\hat{Y}_t$. Select the fitting polynomial coefficients with the smallest fitting errors with the corresponding time-varying window to form the time-varying trend of sample point Y_t.

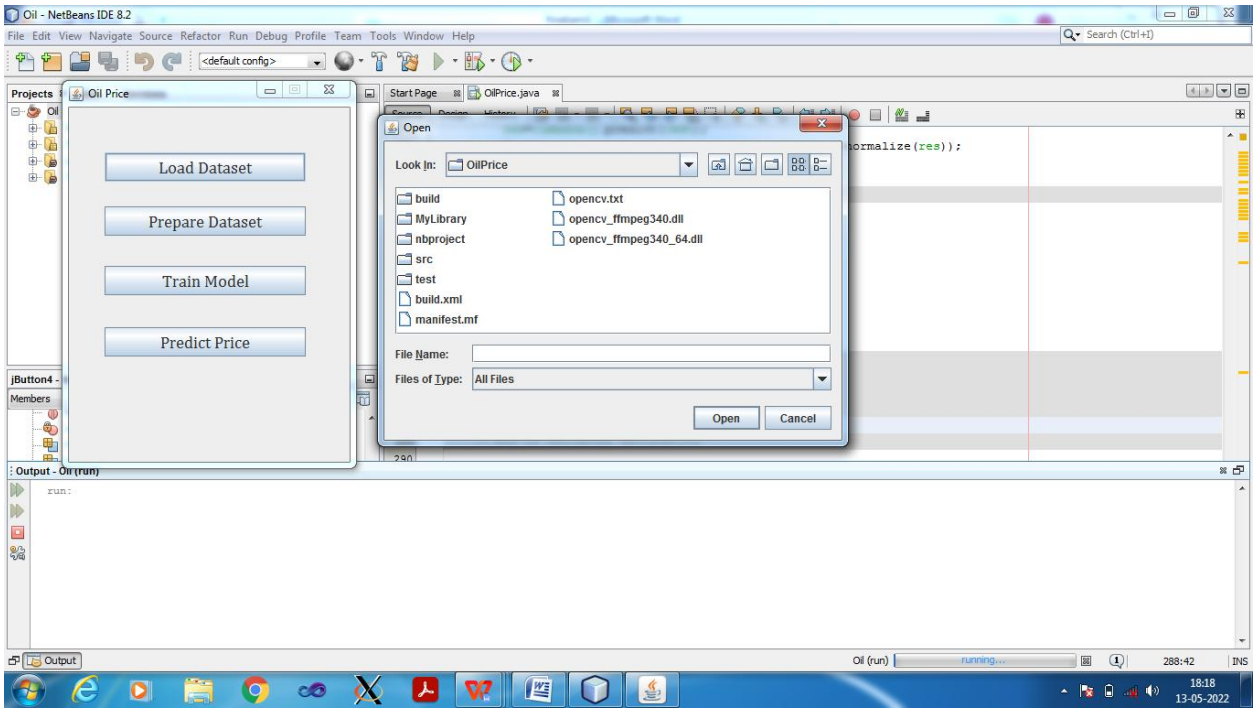
Logistic Regression Analysis

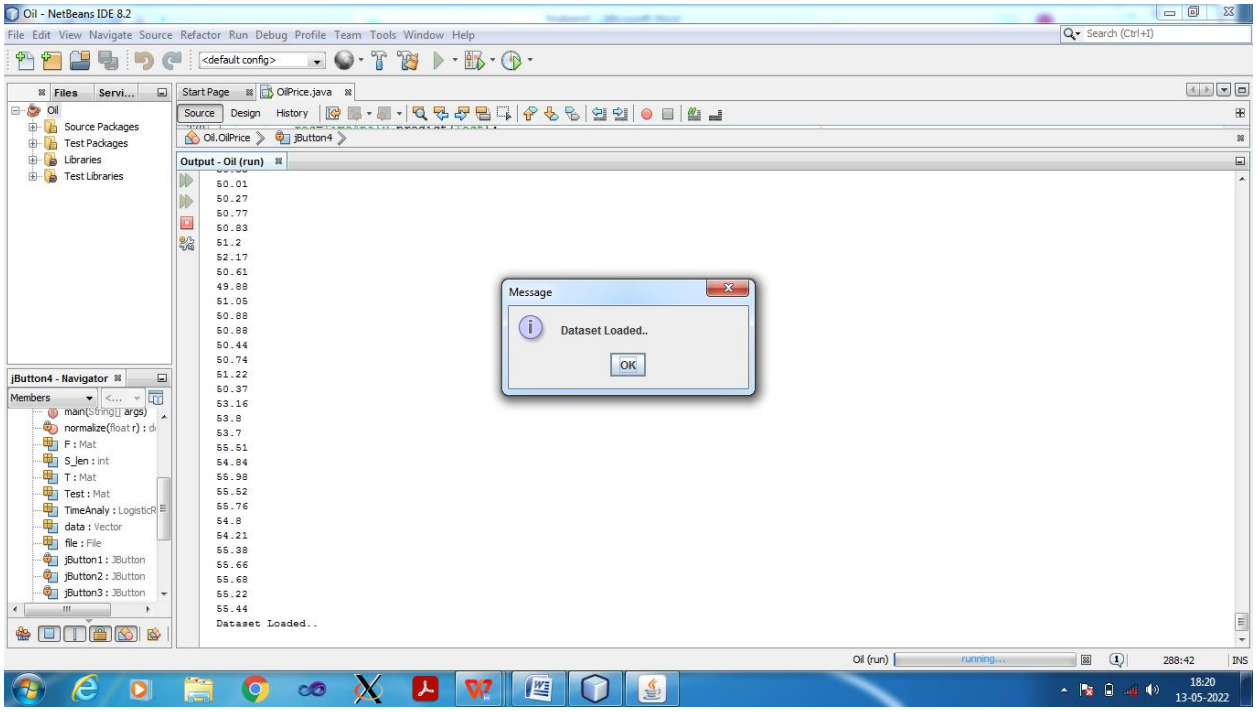
Logistic regression is the appropriate regression analysis to conduct when the dependent variable is dichotomous (binary). Like all regression analyses, the logistic regression is a predictive analysis. Logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more nominal, ordinal, interval or ratio-level independent variables.

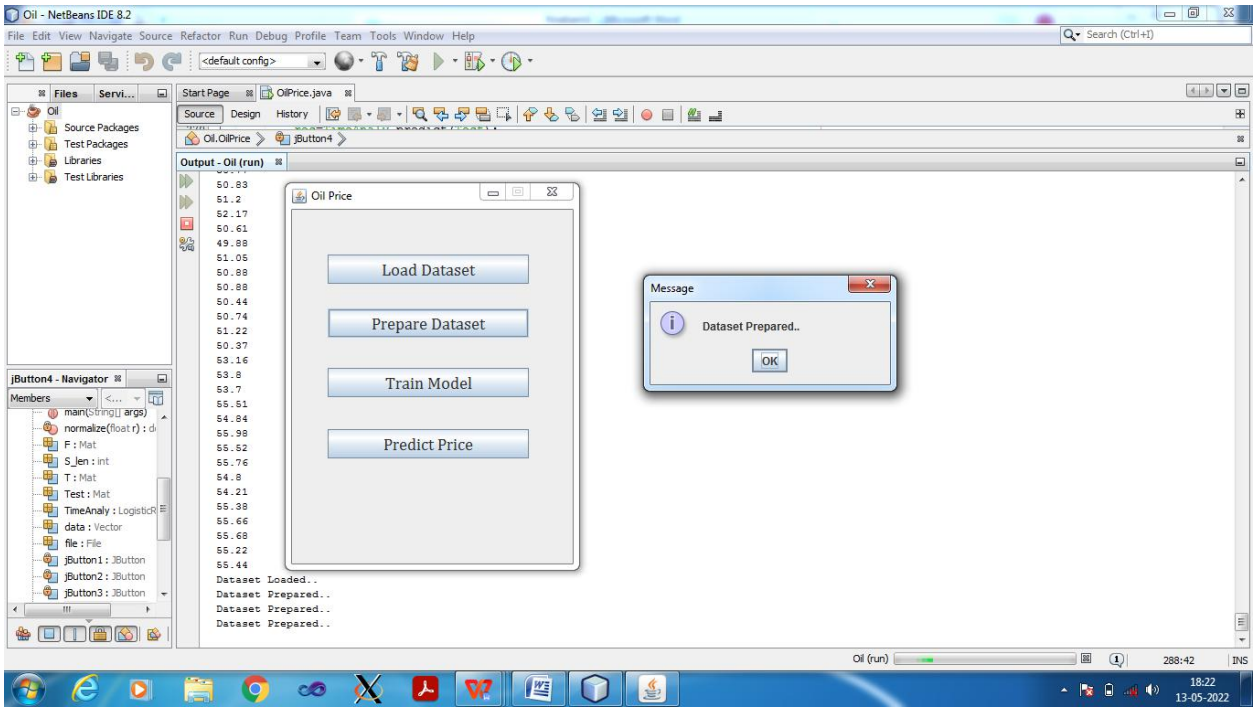
Price Prediction

Based on the forecasting results of the time-varying trends and trend thresholds, a new method for forecasting oil prices is presented. By using Algorithm 2, the predicted oil price can be obtained by inputting the time-varying trend and the trend threshold of the sample point to be predicted. At the same time, different models need to be used for comparison to verify the superiority of the proposed model. To test the prediction accuracy of the TV-TD model outside the sample, we use the mean absolute percentage error ratio (MAPE-ratio), mean squared prediction error ratio (MSPE ratio) and success ratio as evaluation indices.

SCREENSHOTS



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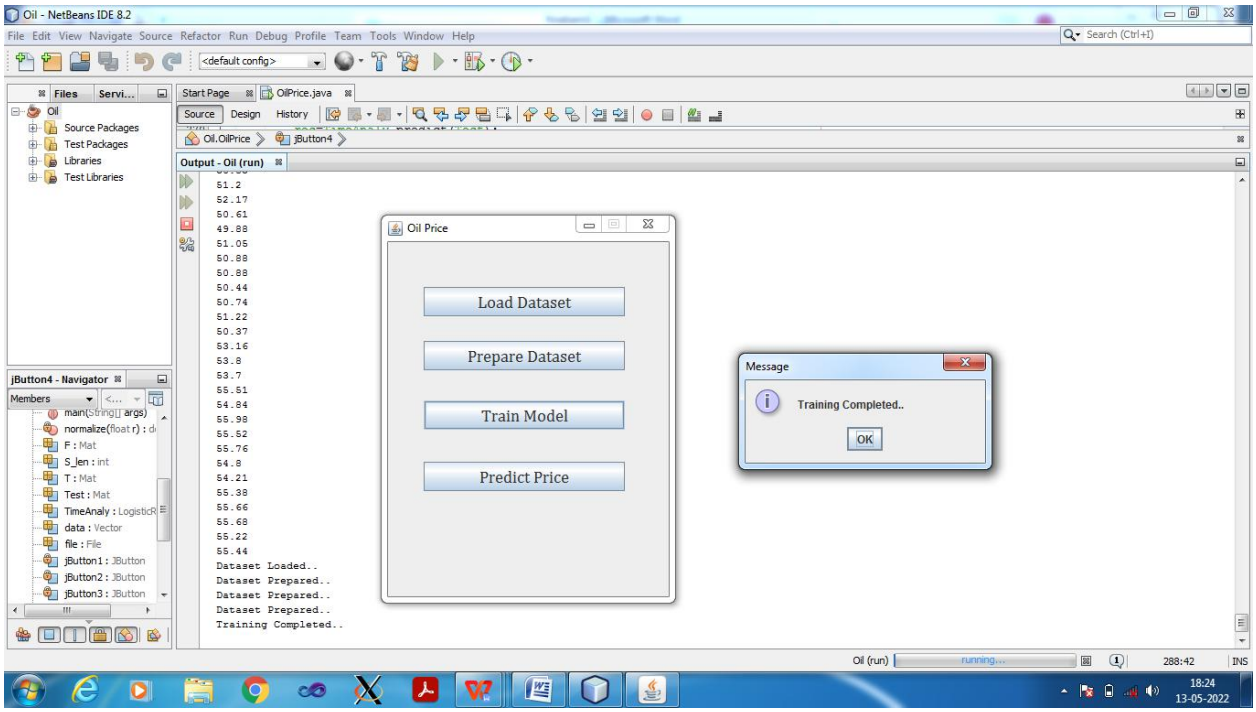
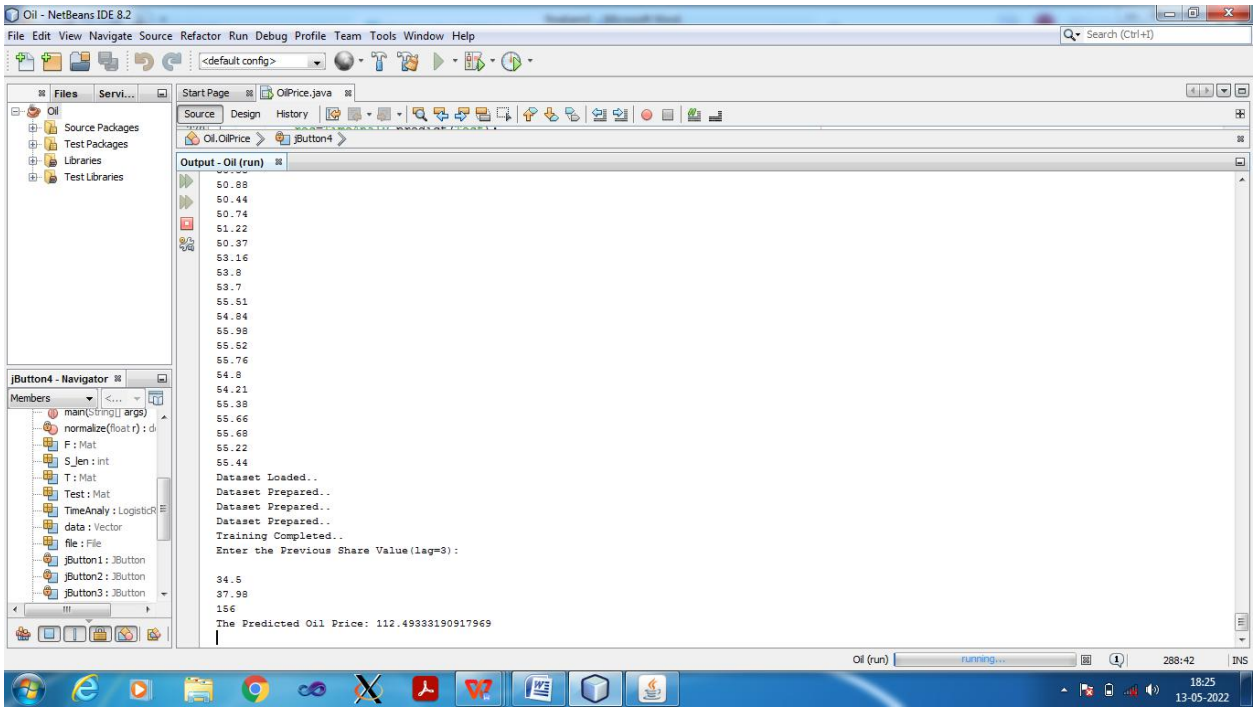

Oil - NetBeans IDE 8.2
Oil Price
Load Dataset
Prepare Dataset
Train Model
Predict Price
Message
Training Completed..
OK
Dataset Loaded..
Dataset Prepared..
Dataset Prepared..
Dataset Prepared..
Training Completed..


Oil - NetBeans IDE 8.2
File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help
Search (Ctrl+I)
<default config>
Files
Servi...
Oil
Source Packages
Test Packages
Libraries
Test Libraries
Start Page
OilPrice.java
Source
Design
History
Oil.OilPrice
jButton4
Output - Oil (run)
50.88
50.44
50.74
51.22
50.37
53.16
53.8
53.7
55.51
54.84
55.98
55.52
55.76
54.8
54.21
55.38
55.66
55.68
55.22
55.44
Dataset Loaded..
Dataset Prepared..
Dataset Prepared..
Dataset Prepared..
Training Completed..
Enter the Previous Share Value(lag=3):
34.5
37.98
156
The Predicted Oil Price: 112.49333190917969
jButton4 - Navigator
Members
main(String[] args)
normalize(float r) : d
F : Mat
S_len : int
T : Mat
Test : Mat
TimeAnaly : LogisticR
data : Vector
file : File
jButton1 : JButton
jButton2 : JButton
jButton3 : JButton
Oil (run)
running...
288:42
INS
18:25
13-05-2022

CODING

```
package Oil;

import static java.awt.Frame.NORMAL;

import java.awt.Graphics;

public class OilPrice extends javax.swing.JFrame {

File file;

String path;

Mat sample;

Mat F;

Mat T;

Mat Test;

float res,s;

LogisticRegression TimeAnaly;

static {

System.loadLibrary(Core.NATIVE_LIBRARY_NAME);  }

public OilPrice() {

initComponents();    }

private void initComponents() {

jButton1 = new javax.swing.JButton();

jButton2 = new javax.swing.JButton();

jButton3 = new javax.swing.JButton();

jButton4 = new javax.swing.JButton();

setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
```

```
setTitle("Oil Price");

setCursor(new java.awt.Cursor(java.awt.Cursor.DEFAULT_CURSOR));

setResizable(false);

addWindowListener(new java.awt.event.WindowAdapter() {

public void windowClosed(java.awt.event.WindowEvent evt) {

formWindowClosed(evt);        }


private void jButton1ActionPerformed(java.awt.event.ActionEvent evt)
{                                        int count = 0;

JFileChooser ch = new JFileChooser();

ch.setCurrentDirectory(new java.io.File("."));

ch.showOpenDialog(null);

file = ch.getSelectedFile();

try {

workbook = Workbook.getWorkbook(file);

sheet = workbook.getSheet(0);

S_len=sheet.getRows();

sample = new Mat(S_len, 1, CV_32FC1);

for (int j = 1; j < sheet.getRows(); j++)

{

for (int i = 0; i < sheet.getColumns(); i++) {

Cell cell = sheet.getCell(i, j);

sample.put(count, 0, Float.parseFloat(cell.getContents()));

count++;
```

```
System.out.println(cell.getContents());
}
}
System.out.println("Dataset Loaded..");
JOptionPane.showMessageDialog(null, "Dataset Loaded..");
}
catch (Exception e) {
e.printStackTrace();
}      }
private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {
lag=3;
F = new Mat(S_len-lag, lag, CV_32FC1);
T = new Mat(S_len-lag, 1, CV_32FC1);
int count=0;
for (int i=lag;i<S_len;i++)
{
for (int j=lag;j>0;j--)
{
F.put(count, j-1, sample.get((i-j),0));
}
T.put(count, 0, sample.get(i,0));
count++;
}
```

```
System.out.println("Dataset Prepared..");
JOptionPane.showMessageDialog(null, "Dataset Prepared..");    }
private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {
TimeAnaly= LogisticRegression.create();
TimeAnaly.train(F, ROW_SAMPLE, T);
System.out.println("Training Completed..");
JOptionPane.showMessageDialog(null, "Training Completed..");
}
private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {
Scanner in=new Scanner(System.in);
Test = new Mat(1, lag, CV_32FC1);
System.out.println("Enter the Previous Share Value(lag="+lag+"): ");
for(int i=0; i<lag;i++)
{
float x=in.nextFloat();
if (x>0)
{            s+=x;
Test.put(1, i, x);
}
else
{
System.out.println("Entet Correct Price Value");
i--;
```

```
} }
res=TimeAnaly.predict(Test);
System.out.println("The Predicted Oil Price: "+normalize(res));
}
public static void main(String args[]) {
new OilPrice().setVisible(true);   }
private javax.swing.JButton jButton1;
private javax.swing.JButton jButton2;
private javax.swing.JButton jButton3;
private javax.swing.JButton jButton4;
private double normalize(float r) {

return ((s/lag)+(r/lag));
} }
```

CONCLUSION

In this project, a new perspective on the description of time series trends-time-varying trends is introduced, and time-varying trends are constructed using coefficients of fitted polynomials and time-varying windows; then, short-term predictions of time series are presented.

The TV-TD model proposed in this project consists of three parts. The first part constructs the time-varying trends. For this part, a new method for decomposing time series is proposed. Time series are decomposed by polynomial fitting into coefficients of the fitting polynomials and the corresponding time-varying window lengths. At the same time, this study also develops a specific algorithm for finding the time-varying trends of time series sample points**.**

FUTURE ENHANCEMENT

In future research, the relationship between time-varying trends and oil prices will be explored so that investors could predict the future changes in Brent oil prices based on changes in WTI's oil prices. On the other hand, the TV-TD model can significantly improve accuracy in areas with large fluctuation ranges. Therefore, the model could be improved to suitable for small price fluctuation ranges.

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[1] A. Khashman and N.I. Nwulu , “Support Vector Machines versus Back Propagation Algorithm for Oil Price Prediction”, Lecture Notes in Computer Science (LNCS), vol. 6677, pp. 530- 538, May/June 2011.

[2] A. Khashman and N.I. Nwulu, “Intelligent Prediction of Crude Oil Prices Using Support Vector Machines”, Proceedings of the 9 th International Symposium on Applied Machine Intelligence and Informatics (SAMI2011),Smolenice, Slovakia, 27-29 January 2011.

[3] L. Yu, Z. Wang and L. Tang, "A decomposition–ensemble model with data-characteristic-driven reconstruction for crude oil price forecasting", vol. 156, pp. 251–267, 15 October 2015.

[4] L. A.Gabralla, R. Jammazi and A. Abraham, "Oil Price Prediction Using Ensemble Machine Learning", Procedings of the International Conference on Computing, Electrical and Electronic Engineeering (ICCEEE), Khartoum, Sudan, 26-28 August 2013.

[5] L. Yu, W. Dai and L. Tang, " A novel decomposition ensemble model with extended extreme learning machine for crude oil price forecasting", Engineering Applications of Artificial Intelligence, vol. 47, pp. 110–121, January 2016.

[6] L. Yu, S. Wang, and K.K. Lai, “Forecasting Crude Oil Price with an EMD-Based Neural Network Ensemble Learning Paradigm”, Energy Economics vol. 30, no. 5, pp. 2623–2635, 2008.

[7] A. Ghaffari and S. Zare, “A Novel Algorithm for Prediction of Crude Oil Price Variation Based on Soft Computing”, Energy Economics vol. 31, no. 4, pp. 531–536, 2009.

INTRODUCTION

The COVID-19 outbreak, which first emerged in China, has spread worldwide. The disease has disrupted global trade, employment, and travel, and many governments had to take strict measures to control the spread of the virus and minimize the burden of morbidity and mortality so that health care systems remain functional. The ongoing COVID-19 pandemic has pushed the need for mobile app solutions at the forefront to reduce the risk of cross-contamination caused by close contact. It becomes harder for universities to trace and track the students manually it becomes automated and easier for monitoring and ensuring safeness among students. As the Safe Campus Management Admin App helps to manage safe campus in the college and universities. The opening of colleges and universities poses new challenges and accompanying risks for transmission on campuses and in their surrounding communities. Although the risk of severe health outcomes from COVID-19 in young adults without underlying health conditions is relatively low, faculty, university staff, and close contacts of college students at home and in the campus might be at a considerably higher risk for severe illness and death if they were to become infected.

Contact tracing and quarantine of contacts identified through contact tracing interrupt transmission between people and are essential public health tools for controlling the virus. Contact tracing can also help people who are at a higher risk of developing severe disease know earlier that they have been exposed so that they can get medical care quicker if they go on to develop symptoms. This app has been implemented for contact tracing, risk assessment, announcement, management of positive students, quarantine students, Covid information about separate students, Contact history, Department Master, Location Master etc. This app is used for rapidly offering effective and usable tools for managing the COVID-19 pandemic in college campuses. Contact tracing is the process of identifying, assessing, and managing people who have been exposed to someone who has been infected with the COVID-19 virus.

Objective

- To identify and classify contacts as early as possible for preventing spread of further transmission around the college campus and other students.
- The main purpose is to test the contacts and to quarantine affected peers based on the covid result process considering factors like –proximity tests, duration, as well as other factors.

SYSTEM SPECIFICATION

HARDWARE REQUIREMENT:

- Hardware specification:
- **Processor:** Intel® Celeron® CPU 3865U / AMD Pro
- **Ram:** 8 GB
- **Hard Disk:** 40GB
- **System type:** 64-bit Operating System

SOFTWARE REQUIREMENTS:

- **Frontend:** Flutter.
- **Backend:** Google Cloud Platform (Firebase)

PROJECT DESCRIPTION

The project for **Infrastructure University Kuala Lumpur** was designed for a **Safe Campus** in a university to detect the linked covid affected peers among the students. The IUKL app consists of a JSON Response stream when parsing it reads to get a device ID. Every profile will be linked to the device ID using the JSON response parsed to find and trace the contacts between the two profiles, which helps to track down link between device to device. By using this we map the people to people contact by changing it. The main technologies used in this was App engine.

We use the App Engine to call the response which was fetched from JSON to parse and update with the working database. The Google Pub Scheduler allows to call the function in the App Engine per minute which is the part of the Google Cloud Engine. The Cloud functions were used as it is a Google Cloud Engine Service along with this the Firebase and Fire store were used to sync the real time database with App Engine.

The other details like Assessments, Announcements were saved in the cloud fire store. The firebase authentication was used with custom claims. As per the custom claims the database security rules were checked for each roll in the data document with user privilege which was limited per security check. There were 2 apps in this such as one for admin and other for students. These were the technologies used in this project. In this App, the admin adds all the details of the student in the university and each student has given a unique device ID. The covid test is result is uploaded to student will be visible to admin in which positive students was visible under the positive student module and they were quarantined in home, in-campus.

If a student (user-negative patient) accidently, came contact with other student (user-positive patient) the automated information will be sent to the student who was in close contact. There are 2 application one for Admin and other for Student**.** The admin consists of

- ❑ Student list
- ❑ Positive student
- ❑ Roomed student
- ❑ My profile
- ❑ Complaints
- ❑ Announcements
- ❑ Assessments
- ❑ Carousel

- Location Master
- Department Master

Student List:

The student list module consists of list of students who were registered in the app both by the user and by the student.

Positive Student:

This module consists of the students whose test result were positive on the PCR and RPC test methods.

Roomed Students:

The Roomed student consist of list of students who were quarantined in the campus on the particular block by admin using location and department master modules.

My Profile Module:

This module consists of Profile of the Super admin who is responsible for creating other admins

Complaints Module:

This module consists of the complaints registered by the students to the university by which the admin can view and close the complaint accordingly.

Assessment Module:

This module consists of the creating assessment by admin to the students for regular checking up among the students.

Announcement Module:

The Announcement Module consists of the announcements made by the admin to the students to announce or release a message by the management.

Carousel Module:

The Carrousel Module consist of the image addition section in which the admin can add image by which the student can view in their app.

Department Master Module:

The Department Module consist of the list of departments by which the admin can also add new department.

Location Master Module:

The Location Module consist of the location and blocks information by which the admin can add the particular location of the university.

SYSTEM STUDY

EXISTING SYSTEM

The existing system in covid-19 pandemic was so destructive that which was over 3 years and can only trace and find out the people manually by the test records taken by individuals from the hospitals and test centres. And there is only manual tracing was applicable in certain era where Traditional contact tracing is a labour-intensive process of interviews and detective work and it is also an unknown scenario if someone crossed the affected areas. In the case of a pandemic, manual processes take too long time. Therefore, quicker measures need to be put in place to curb the spread of the disease and not overwhelm the public health system, while building layout and management will shift radically in months to find out and keeping track of who enters a particular building from a security standpoint is always critical.

PROPOSED SYSTEM

This proposed system can aid in outbreak response and symptom tracking aspects of contact tracing include case investigation, listing and monitoring of contacts, and monitoring. This proposed system will manage dynamic relationships between cases and contacts because contacts may have multiple links. This system will combine the phone and the Internet to create a real-time contact tracing system of COVID-19 pandemic as a complement of the manual contact tracing. It will be an interactive student response application for both student and management by which each crossed person will be notified in a second even if they crossed any affected persons in the area. By the data given in the organization each data will be assigned for individual.

SYSTEM ANALYSIS

FEASIBILITY STUDY:

The feasibility of the project is analysed in this phase and a brief study about the application is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are

- ♦ ECONOMICAL FEASIBILITY
- ♦ TECHNICAL FEASIBILITY
- ♦ SOCIAL FEASIBILITY

ECONOMICAL FEASIBILITY:

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used under GCP which is freely available to develop a application. Only the customized products had to be purchased.

TECHNICAL FEASIBILITY:

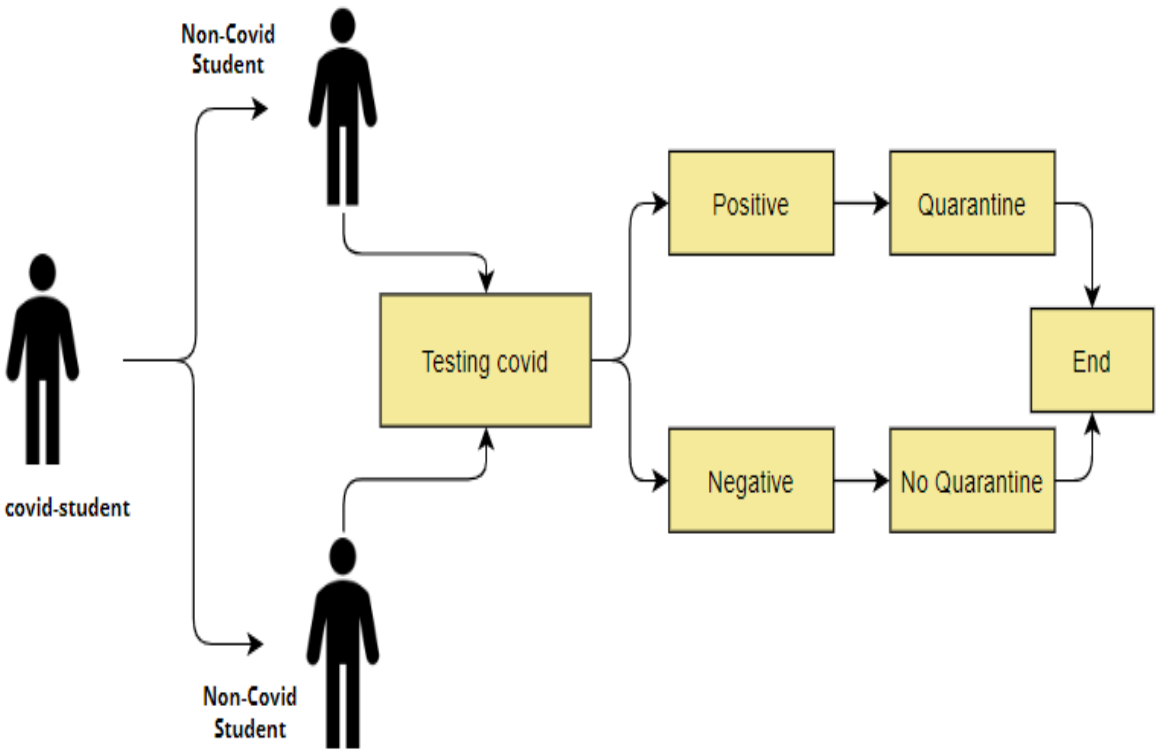
This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

SOCIAL FEASIBILITY:

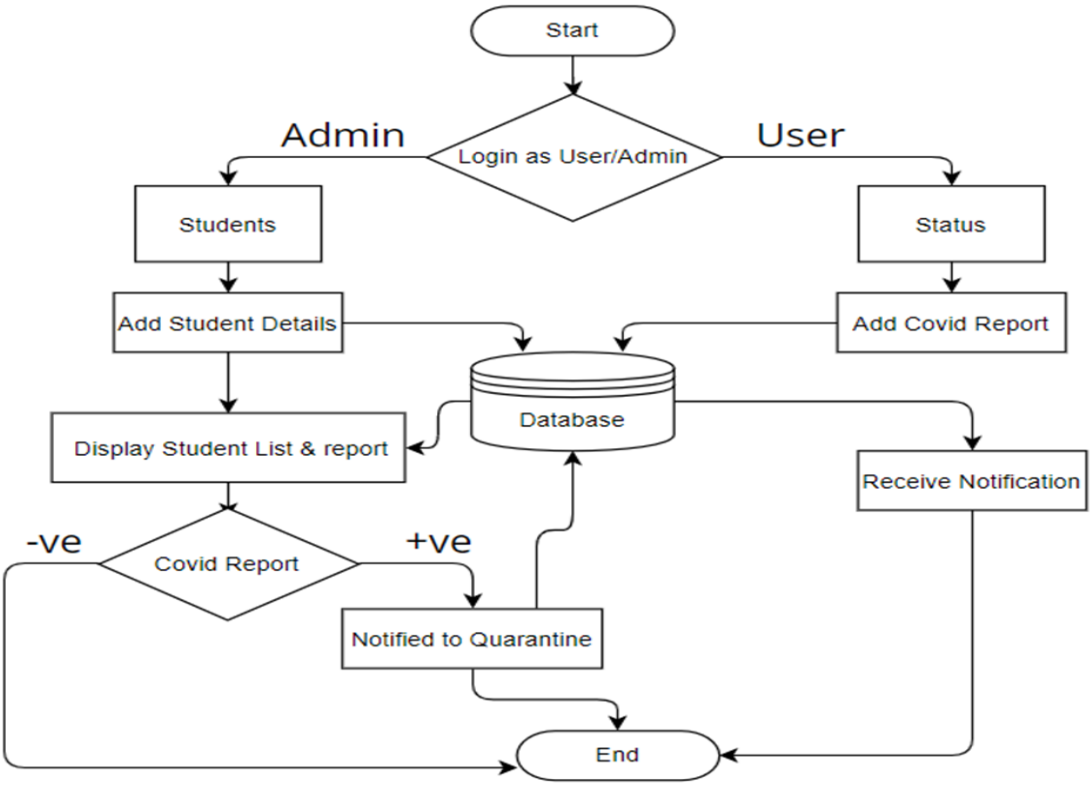
The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. The level of confidence must be raised so that one should also be able to make some constructive criticism, which is welcomed, as he is the final user of the system.

SYSTEM DESIGN

FLOW CHART



DATA FLOW DIAGRAM



SYSTEM TESTING

Testing is a process of checking whether the developed system is working according to the original objectives and requirements. It is a set of activities that can be planned in advance and conducted systematically. Testing is vital to the success of the system. System testing makes a logical assumption that if all the parts of the system are correct, the global will be successfully achieved. In adequate testing if not testing leads to errors that may not appear even many months. This creates two problems, the time lag between the cause and the appearance of the problem and the effect of the system errors on the files and records within the system. A small system error can conceivably explode into a much larger Problem. Effective testing early in the purpose translates directly into long term cost savings from a reduced number of errors. Another reason for system testing is its utility, as a user-oriented vehicle before implementation. The best programs are worthless if it produces the correct outputs.

UNIT TESTING:

A program represents the logical elements of a system. For a program to run satisfactorily, it must compile and test data correctly and tie in properly with other programs. Achieving an error free program is the responsibility of the programmer. Program testing checks for two types of errors: syntax and logical. Syntax error is a program statement that violates one or more rules of the language in which it is written. An improperly defined field dimension or omitted keywords are common syntax errors. These errors are shown through error message generated by the computer. For Logic errors the programmer must examine the output carefully.

Description	Expected result
Test for application mobile ratio properties.	All the properties of the pixel in a mobile resolution are to be properly aligned and displayed.
Test for touch operations.	All the mouse (like touch operations) like click, drag, etc. must perform the necessary operations without any exceptions.

FUNCTIONAL TESTING:

Functional testing of an application is used to prove the application delivers correct results, using enough inputs to give an adequate level of confidence that will work correctly for all sets of inputs. The functional testing will need to prove that the application works for each client type and that personalization function work correctly. When a program is tested, the actual output is compared with the expected output. When there is a discrepancy the sequence of instructions must be traced to determine the problem. The process is facilitated by breaking the program into self-contained portions, each of which can be checked at certain key points. The idea is to compare program values against desk-calculated values to isolate the problems.

Description	Expected result
Test for all modules.	All peers should communicate in the group.
Test for various peer in a distributed network framework as it displays all users available in the group.	The result after execution should give the accurate result.

NON-FUNCTIONAL TESTING:

The Non-Functional software testing encompasses a rich spectrum of testing strategies, describing the expected results for every test case. It uses symbolic analysis techniques. This testing used to check that an application will work in the operational environment. Non-functional testing includes:

- Load testing
- Performance testing
- Usability testing
- Reliability testing
- Security testing

LOAD TESTING:

An important tool for implementing system tests is a Load generator. A Load generator is essential for testing quality requirements such as performance and stress. A load can be a real load, that is, the system can be put under test to real usage by having actual telephone users connected to it. They will generate test input data for system test.

Description	Expected result
It is necessary to ascertain that the application behaves correctly under loads when ‘Server busy’ response is received.	Should designate another active node as a Server.

PERFORMANCE TESTING:

Performance tests are utilized in order to determine the widely defined performance of the software system such as execution time associated with various parts of the code, response time and device utilization. The intent of this testing is to identify weak points of the software system and quantify its shortcomings.

Description	Expected result
This is required to assure that an application perforce adequately, having the capability to handle many peers, delivering its results in expected time and using an acceptable level of resource and it is an aspect of operational management.	Should handle large input values, and produce accurate result in an expected time.

RELIABILITY TESTING:

The software reliability is the ability of a system or component to perform its required functions under stated conditions for a specified period of time and it is being ensured in this testing. Reliability can be expressed as the ability of the software to reveal defects under testing conditions, according to the specified requirements. It the portability that a software system will operate without failure under given conditions for a given time interval and it focuses on the behaviour of the software element. It forms a part of the software quality control team.

Description	Expected result
This is to check that the server is rugged and reliable and can handle the failure of any of the components involved in provide the application.	In case of failure of the server an alternate server should take over the job.

SECURITY TESTING:

Security testing evaluates system characteristics that relate to the availability, integrity and confidentiality of the system data and services. Users/Clients should be encouraged to make sure their security needs are very clearly known at requirements time, so that the security issues can be addressed by the designers and testers.

Description	Expected result
Checking that the user identification is authenticated.	In case failure it should not be connected in the framework.
Check whether group keys in a tree are shared by all peers.	The peers should know group key in the same group.

WHITE BOX TESTING:

White box testing, sometimes called glass-box testing is a test case design method that uses the control structure of the procedural design to derive test cases. Using white box testing method, the software engineer can derive test cases. The White box testing focuses on the inner structure of the software structure to be tested.

Description	Expected result
Exercise all logical decisions on their true and false sides.	All the logical decisions must be valid.
Execute all loops at their boundaries and within their operational bounds.	All the loops must be finite.
Exercise internal data structures to ensure their validity.	All the data structures must be valid.

BLACK BOX TESTING:

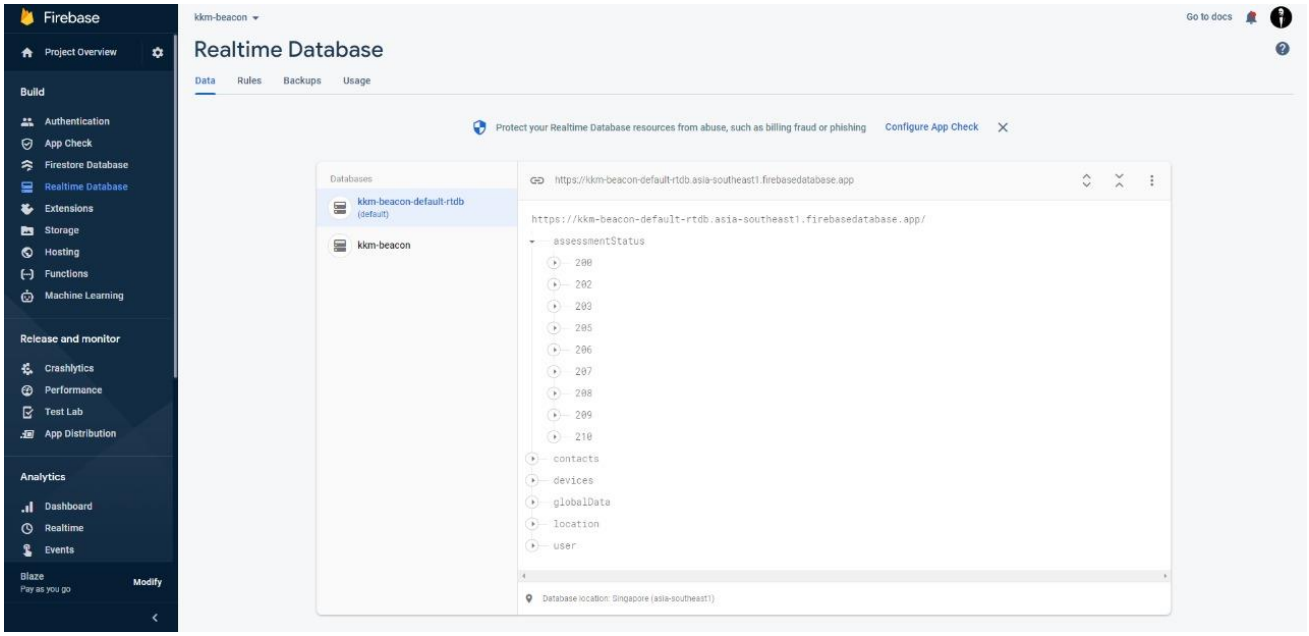
Black box testing, also called behavioural testing, focuses on the functional requirements of the software. That is, black testing enables the software engineer to derive sets of input conditions that will fully exercise all functional requirements for a program. Black box testing is not alternative to white box techniques. Rather it is a complementary approach that is likely to uncover a different class of errors than white box methods. Black box testing attempts to find errors which focuses on inputs, outputs, and principal function of a software module. The starting point of the black box testing is either a specification or code. The contents of the box are hidden and the stimulated software should produce the desired results.

Description	Expected result
To check for incorrect or missing functions.	All the functions must be valid.
To check for interface errors.	The entire interface must function normally.
To check for errors in a data structures or external data base access.	The database updating and retrieval must be done.
To check for initialization and termination errors.	All the functions and data structures must be initialized properly and terminated normally.

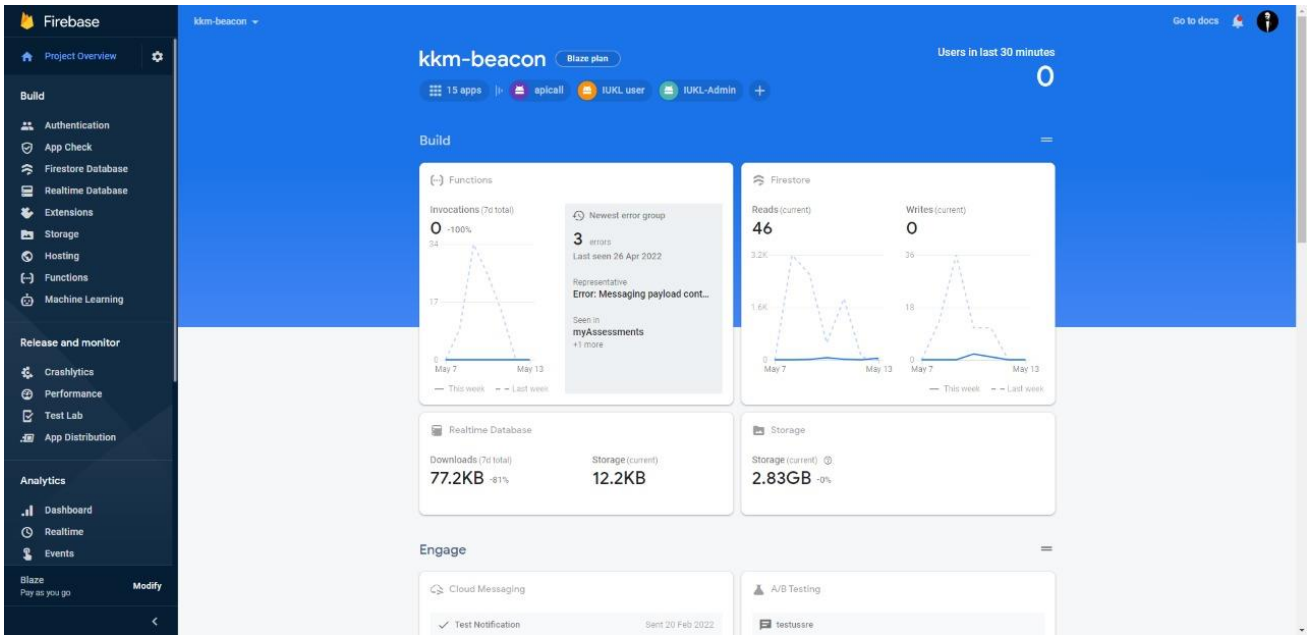
All the above system testing strategies are carried out in as the development, documentation and institutionalization of the proposed goals and related policies is essential.

DATABASE DESCRIPTION

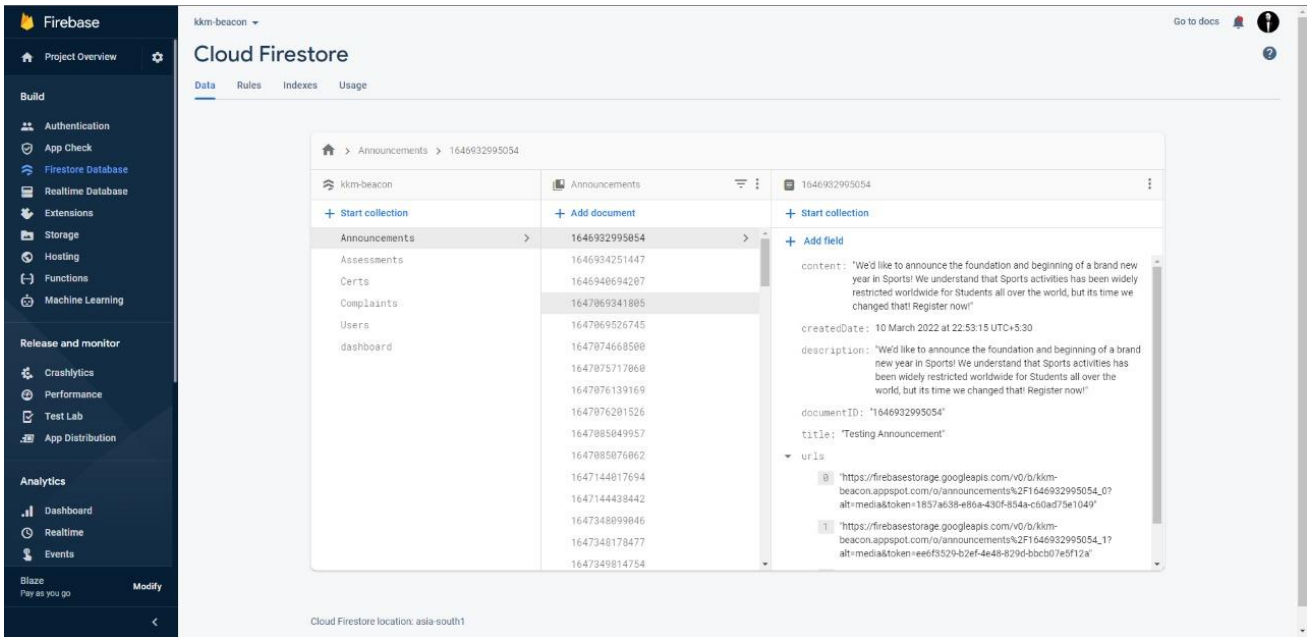
Real-time Database



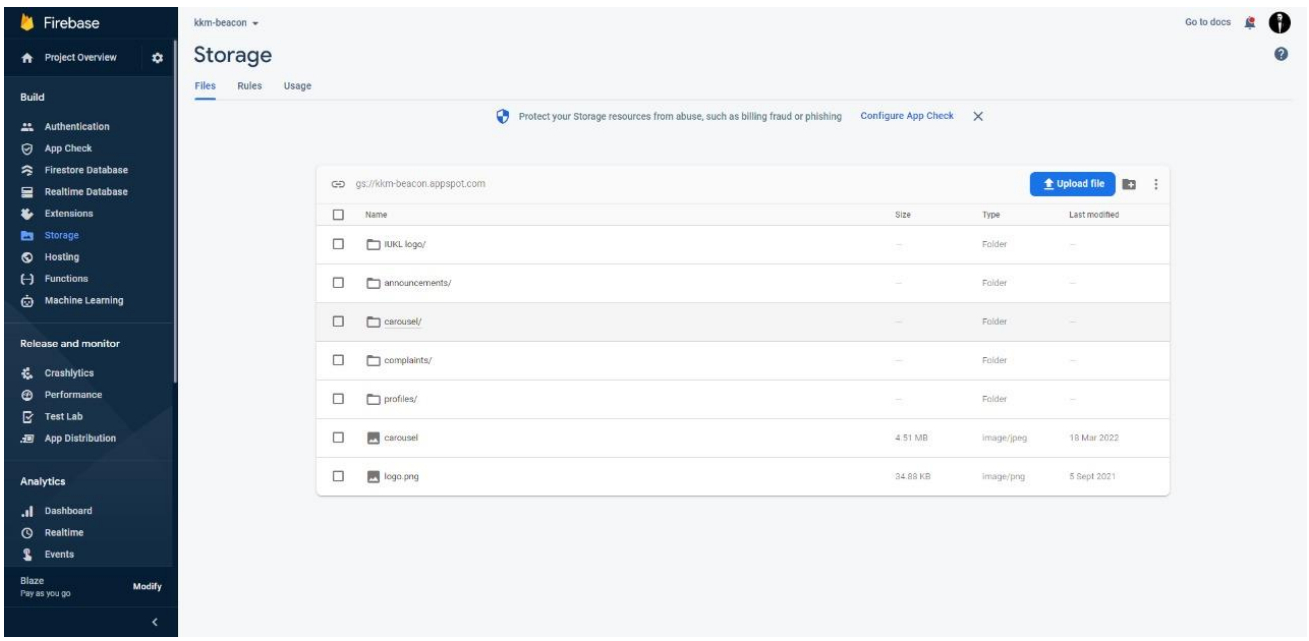
Beacon History



User Data



Storage



CODING

Contact – Mail Alert

```
<body class="body"
style="padding:0 !important; margin:0 auto !important; display:block !important; min-width:100%
!important; width:100% !important; background:#f4ecfa; -webkit-text-size-adjust:none;">
<center>
<table width="100%" border="0" cellspacing="0" cellpadding="0"
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<tr>
<td style="margin: 0; padding: 0; width: 100%; height: 100%;" align="center" valign="top">
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<tr>
<td class="td"
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!important; color:#6e6e6e; text-align:right; padding-top: 20px; padding-bottom: 20px;">
</td>
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<!-- Container -->
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<tr>
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right: 15px;">
<!-- <a href="#" target="_blank"><img
src="https://iukl.edu.my/wp-content/uploads/2020/01/IUKL-Logo.png"
width="112" height="43"
border="0" alt="" /></a> -->
```

```
</td>
</tr>
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<!-- Logo -->

<!-- Main -->
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<strong>RESET
PASSWORD</strong>
</td>
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</a>
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We've received a
request to reset
the password for
the IUKL Safe
```

Campus

Application account
associated with
User (ID) .
No
changes have
been made to
your account yet.
</td>
</tr>
<tr>
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You can reset
password by
clicking the
button below:
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<span
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Your
Password

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If you didn't
make this
request, please
disregard this
email.
</td>

```
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Please note that
your password
will not change
unless you
click the link
above and create
a new one. This
link will expire
in one day. If your link has
expired, you can
always request
another
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if you've
requested
multiple reset
emails,

please make sure
you click the
link inside the
most recent
email.
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-The
IUKL
Team
</td>
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<!--END Bottom -->
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</center>
</body>
```
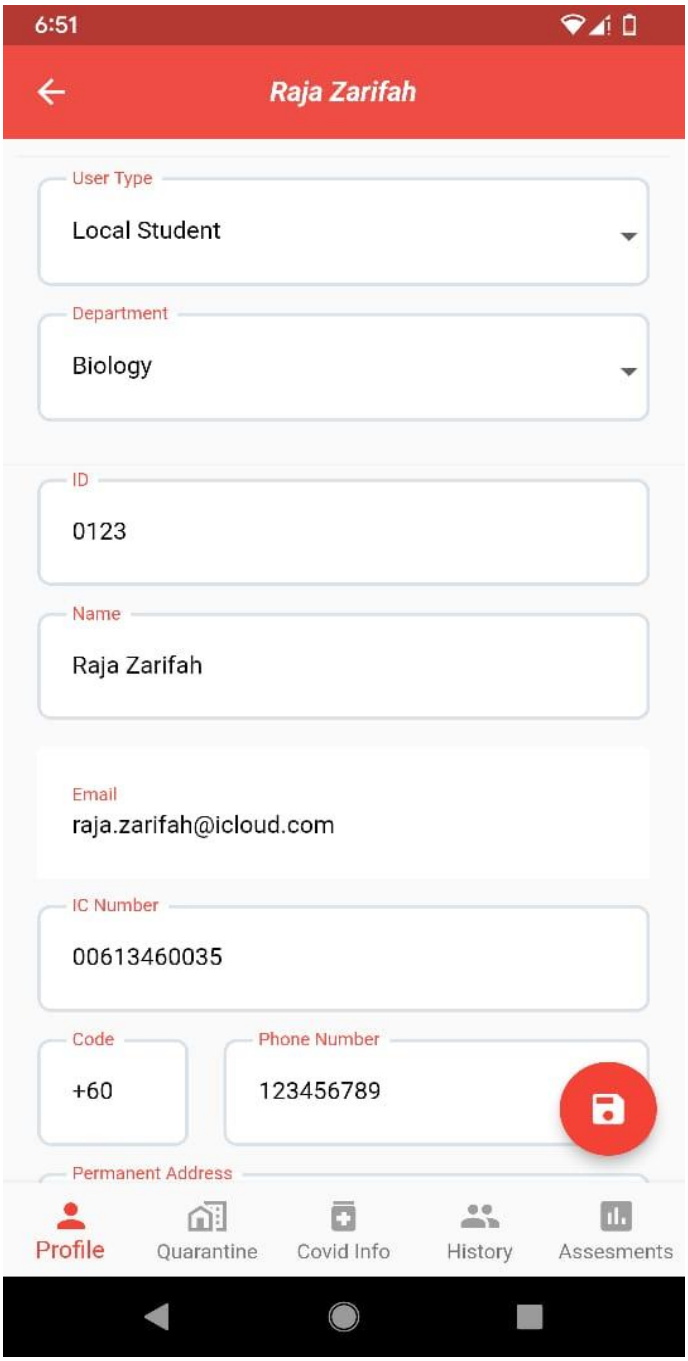
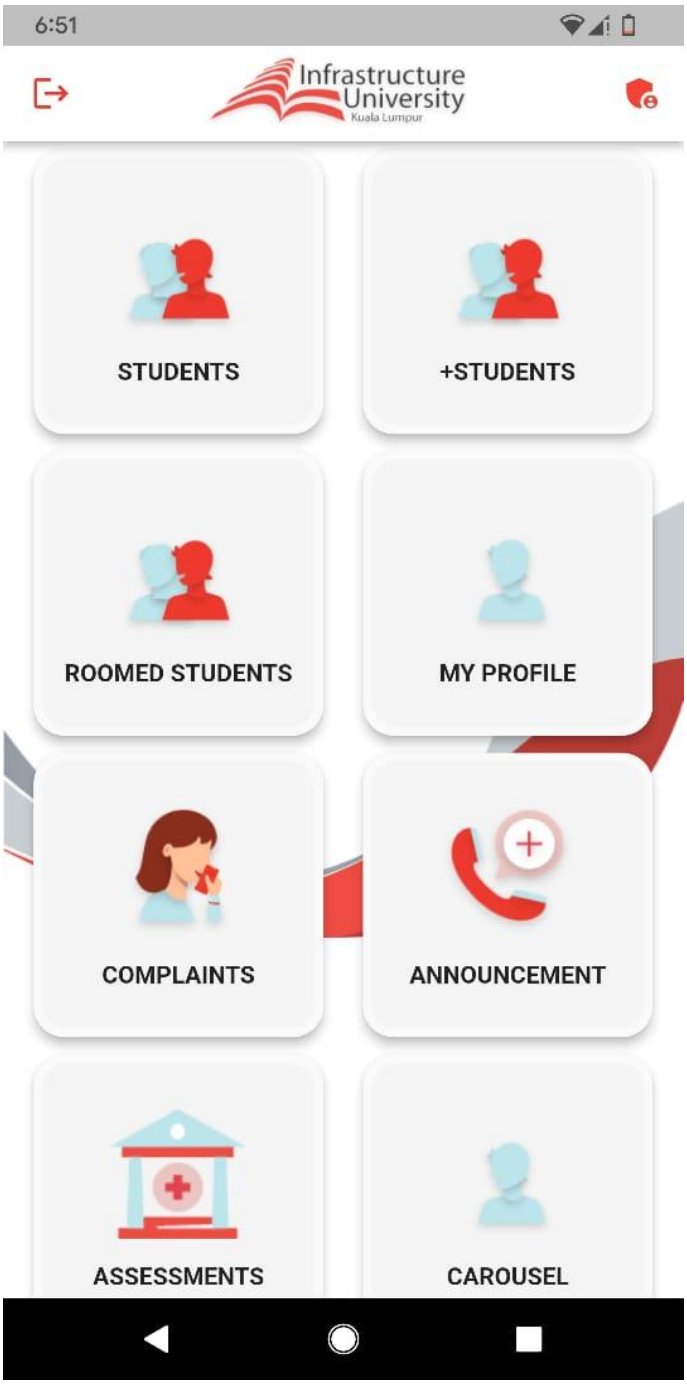

SCREENSHOTS

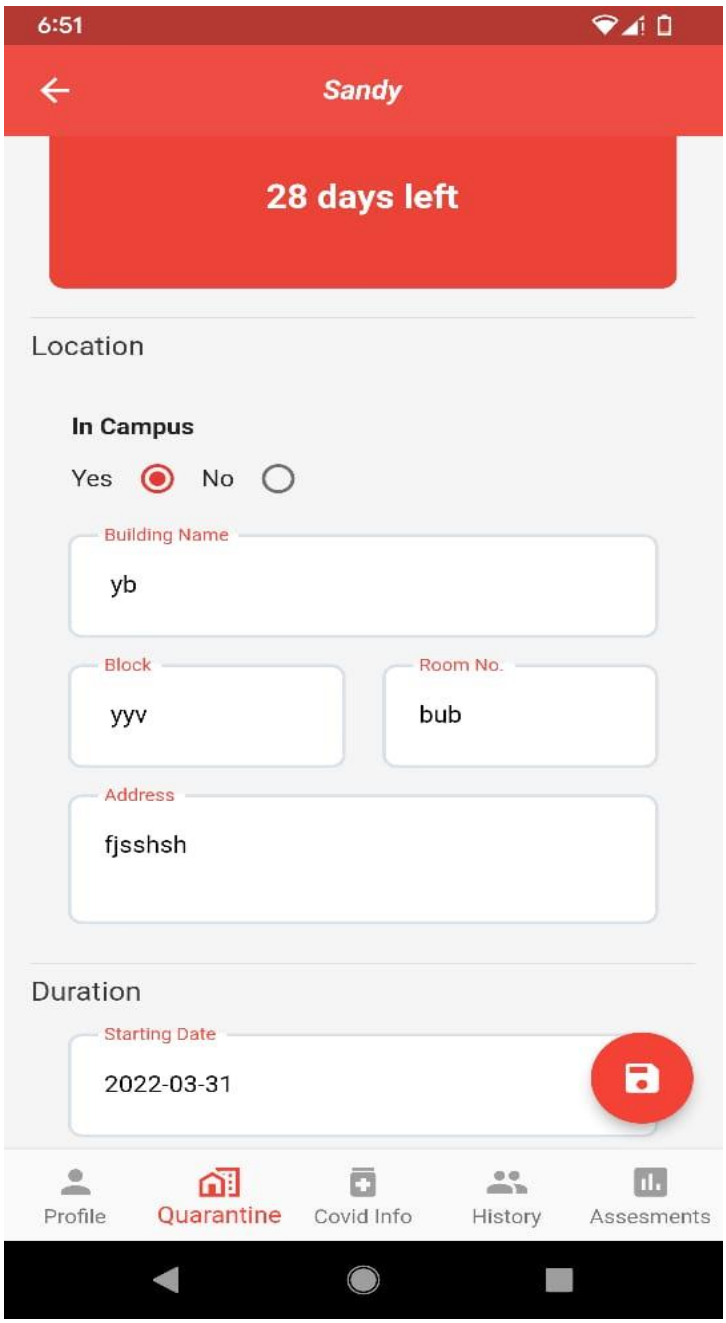
Student Profile



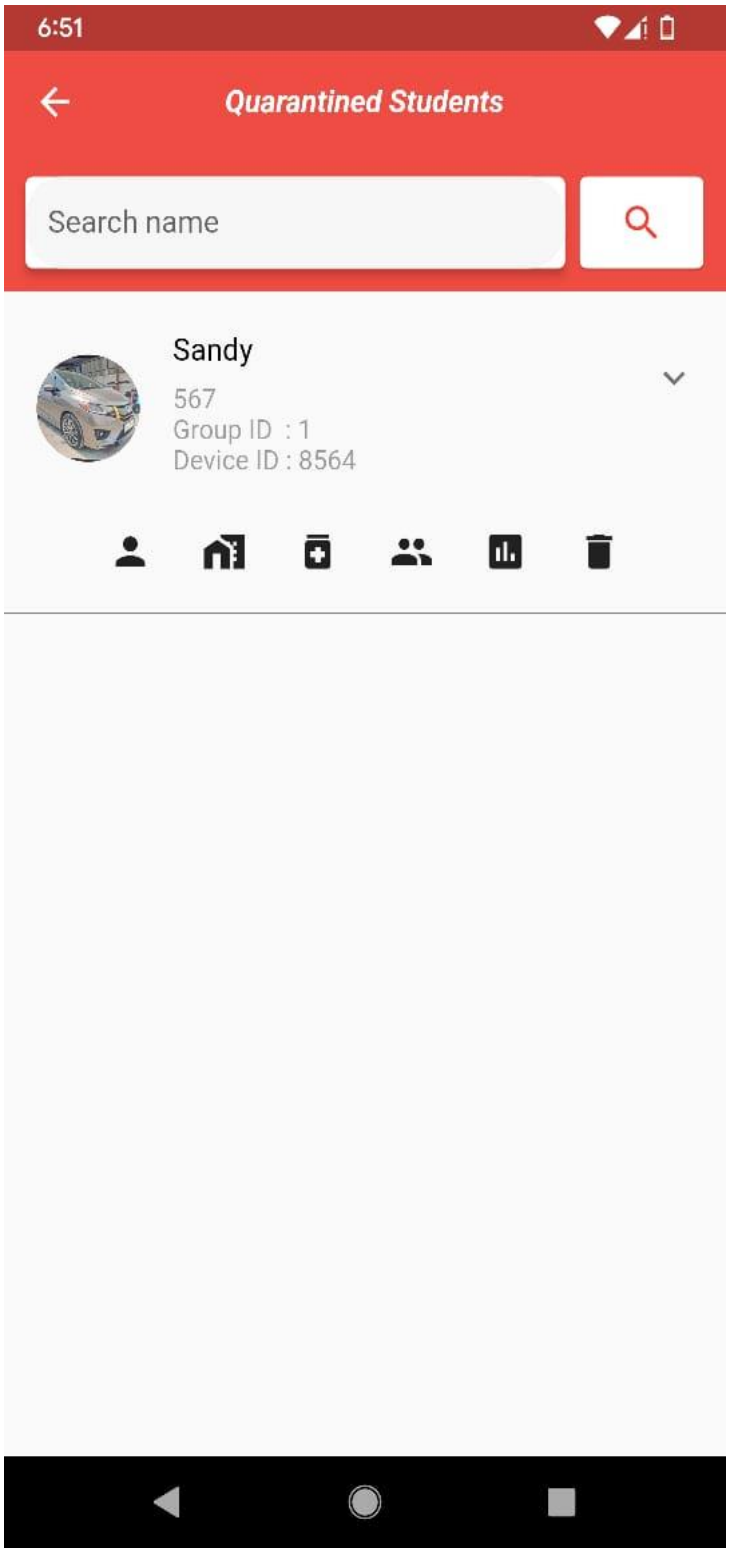
Admin Panel


6:51
Infrastructure University
Kuala Lumpur
STUDENTS
+STUDENTS
ROOMED STUDENTS
MY PROFILE
COMPLAINTS
ANNOUNCEMENT
ASSESSMENTS
CAROUSEL

Student details Module



Quarantine Module



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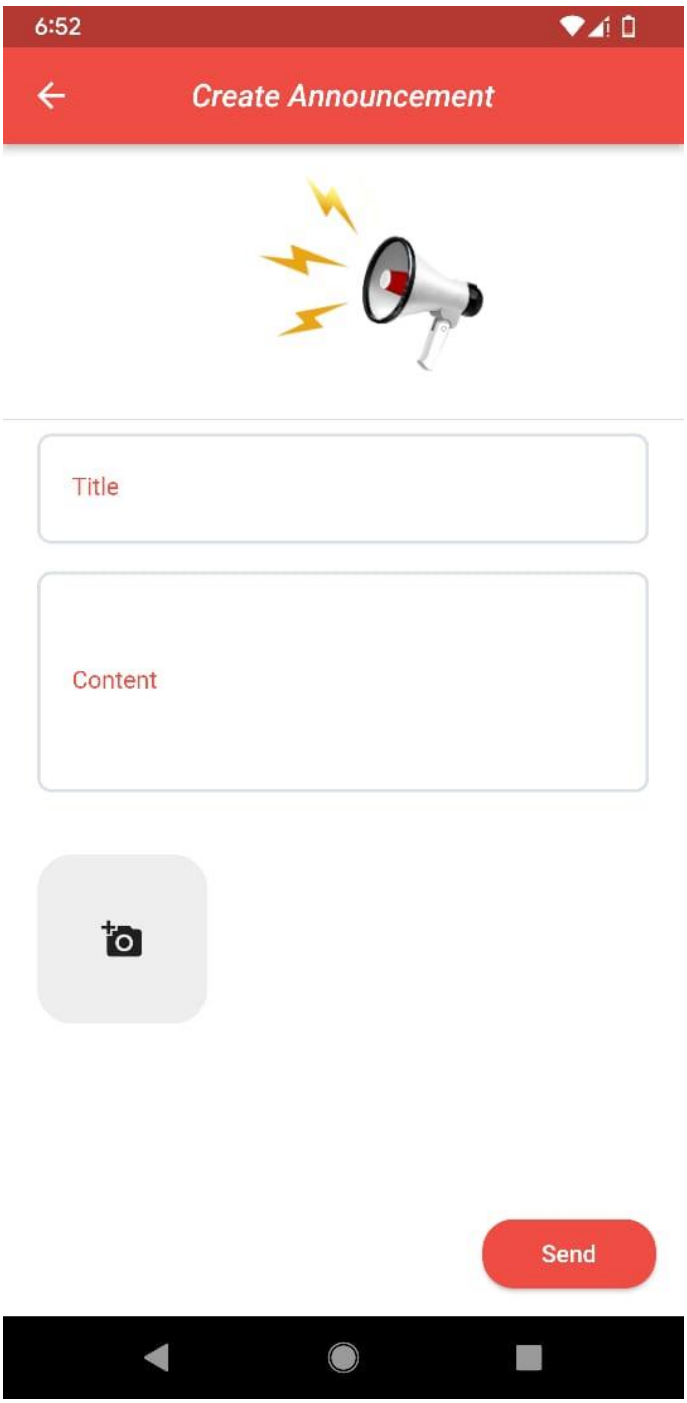
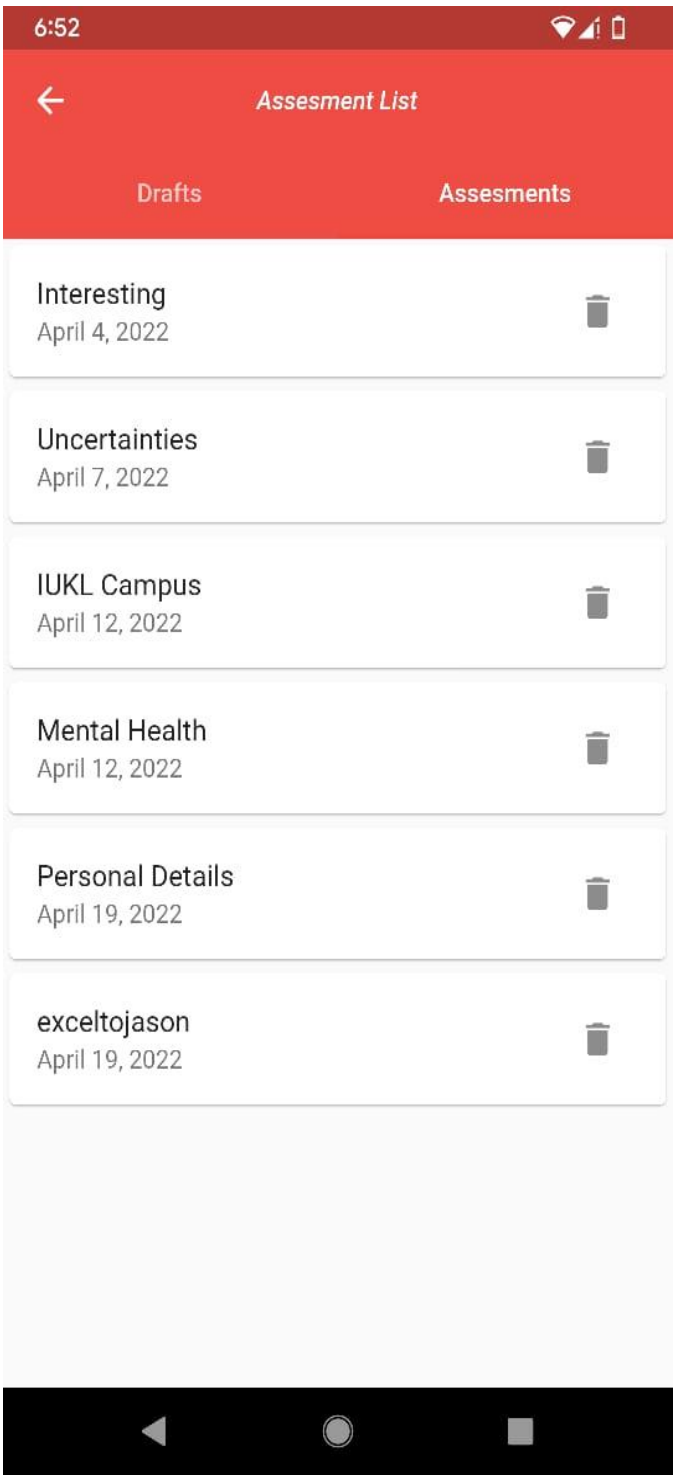
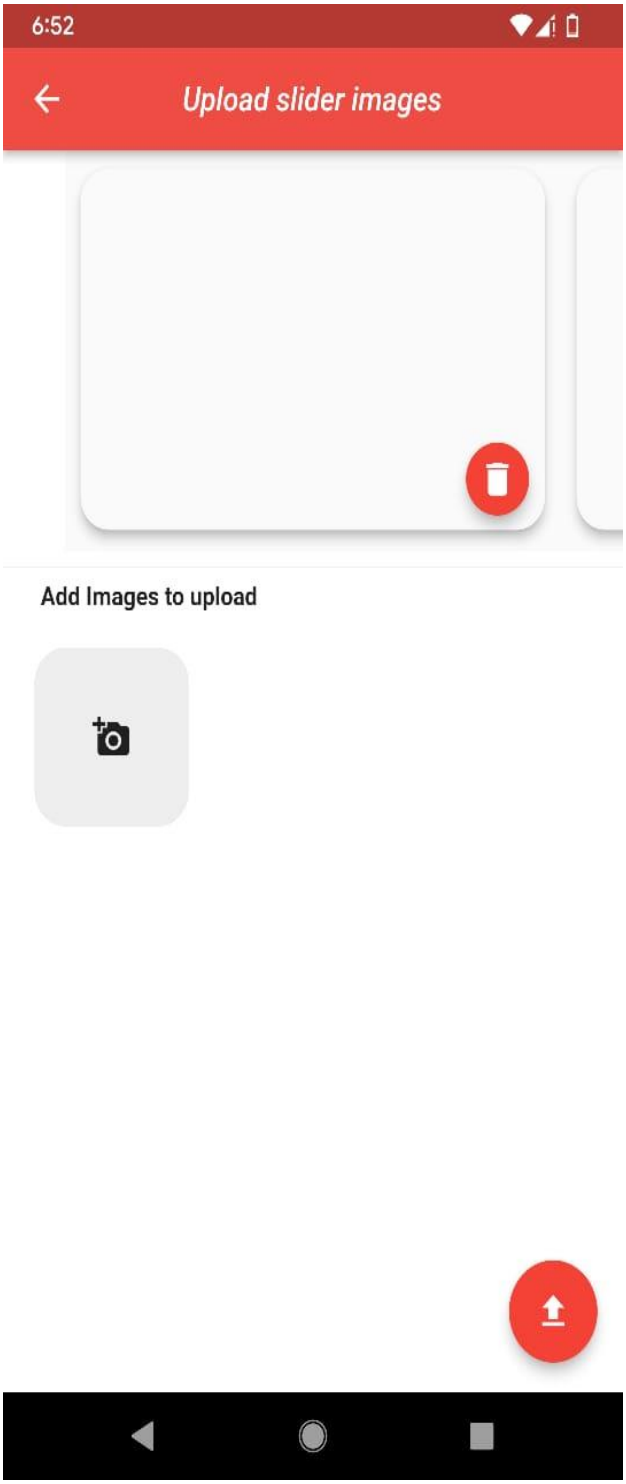


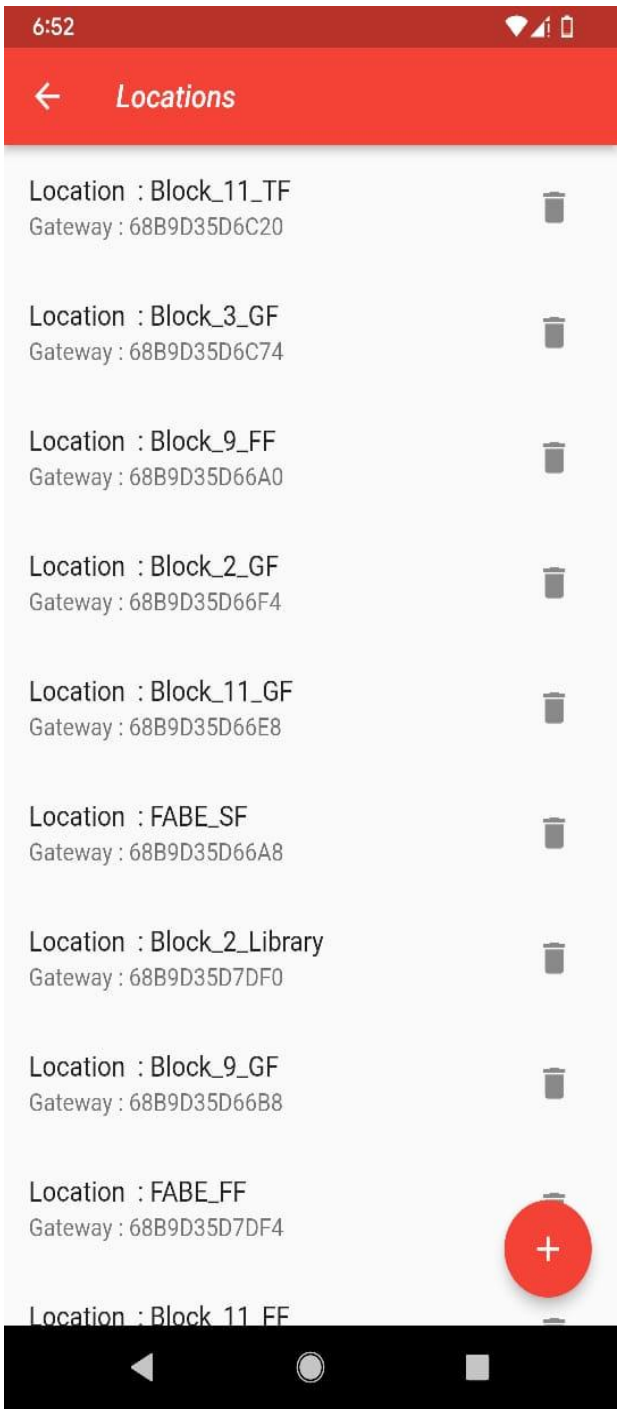
Assessment Module



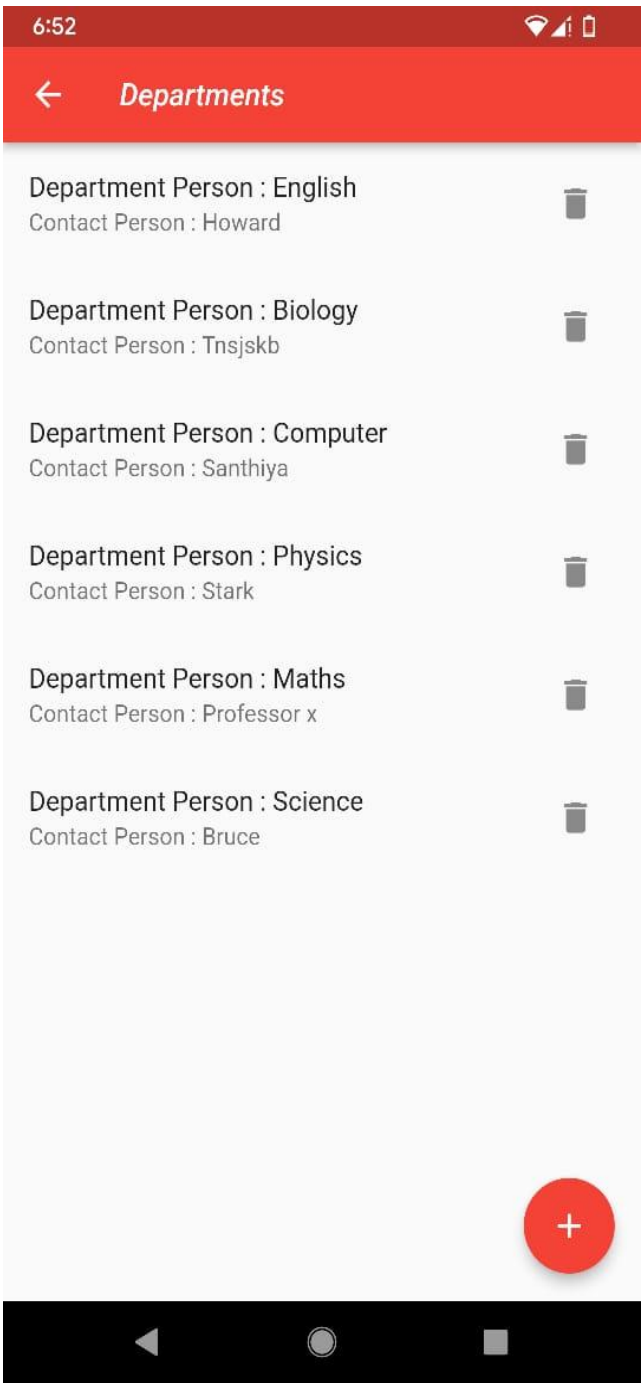
Carousel Module



Location Module



Department Module



CONCLUSION

The overall system was designed for the purpose to manage safe campus in the universities. The digital contact tracing has been introduced as one of the easy and efficient methods to trace people in close contact with infected COVID-19 cases. This tracing could be an effective strategy to break the chain of infection transmission among people in the world which makes the world healthier and safer to live in. The resulting information and trends are valuable for governments and organisations who were seeking to track the COVID-19 outbreak, warn vulnerable communities, and understand the impact of policies such as social distancing and confinement.

Future Enhancement

- As the future enhancement we can implement this app in students ID Card to trace and track close contacts between them.
- We can also implement this in students watch so that it will easy for managing covid cases in campus.
- We can also implement Google Map Engine in this app to find particular person location.
- We can also integrate zoom, google meet classes to help the students and universities for developing virtual classes.
- We can also integrate chatbot.

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- https://material.io/develop/flutter
- https://dart.dev/tutorials
- https://cloud.google.com/training

CROP YIELD PREDICTION USING DEEP REINFORCEMET LEARNING

A project submitted to

ST.MARY'S COLLEGE (Autonomous), Thoothukudi.

Affiliated to

MANONMANIAM SUNDARANAR UNIVERSITY,

TIRUNELVELI

In partial fulfillment of the award of the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

Submitted by

H. SATHYA BALA

Reg.No.: 20SPCS22

Under the Supervision and Guidance

of

Ms.A.Jenitta Jebamalar MSc(IT).,MSc(CS).,MPhil.,B.Ed.,

PG DEPARTMENT OF COMPUTER SCIENCE (SSC)

St. Mary's College (Autonomous), Thoothukudi-628001

May 2022

CERTIFICATE

This is to certify that this project work entitled as **"CROP YIELD PREDICTION USING DEEP REINFORCEMET LEARNING"** is submitted to St. Mary's College (Autonomous), Thoothukudi affiliated to Manonmaniam Sundaranar University, Tirunelveli, in partial fulfillment for the award of the degree of Master of Science in Computer Science for the work done during the year 2021-2022 by

H. SATHYA BALA (Reg.No.: 20SPCS22).

Signature of the Guide **Signature of the Co-Ordinator**

Signature of the Director **Signature of the Principal**

Signature of the Examiner

DECLARATION

I do hereby declare that the project entitled **"CROP YIELD PREDICTION USING DEEP REINFORCEMET LEARNING"** submitted for the degree of Master of Science in Computer Science in my original work carried out under the guidance of **Ms. A. Jenitta Jebamalar MSc(IT)., MSc(CS)., MPhil., B.Ed,** Assistant Professor**,** PG Department of Computer Science(SSC), St.Mary's College (Autonomous), Thoothukudi.

Station: Thoothukudi. **Signature of the Student**

Date:

ACKNOWLEDGEMENT

I express my first and foremost thanks to God Almighty for his gracious help and shower of blessings for having rendered us the strength and support to finish our project successfully.

My sincere thanks to Dr. Sr. A. S. J. Lucia Rose M.Sc., PGDCA., M.Phil., Ph.D., Principal,
Rev. Sr. Flora Mary, Secretary, Rev. Sr. S. Josephine Jeyarani, Director of SSC, St. Mary's College (Autonomous), Thoothukudi, for giving permission to work on this project.

I convey my heartfelt thanks to Ms.C.Nayanthra Mascarenhas M.Sc., M.Phil., SET., Assistant Professor and Coordinator, PG Computer Science(SSC), for her support and counsel.

I express my hearty thanks to my guide Ms. A. Jenitta Jebamalar M.Sc (IT)., M.Sc (CS)., M.Phil., B.Ed., Assistant professor, PG Department of Computer Science (SSC),for her support and counsel. For her valuable suggestions, gentle guidance, enthusiastic ideas, to carry out and complete my work entirely.

I also express my boundless thanks to Dr. A. Vithya Vijayalakshmi., MCA., M.Phil., Ph.D., Assistant Professor, PG Department of Computer Science (SSC),for their kind cooperation in successful completion of the project.

I am much indebted to Dr.P.Johnson Durai Raj, Director, Postulate Infotech for his untiring effort, Immense knowledge and priceless contribution without which I couldn't have finished my work effectively on time.

I thank my family members especially my parents for their encouragement and support both morally and financially which helped me to finish the project successfully.

POSTULATE

14-05-2022

To

The Head of the Department

PG Department of Computer Science (SSC)

St. Mary's College (Autonomous)

Thoothukudi

Dear Sir/Madam,

Sub: Project Completion Certificate-Reg

On behalf of **POSTULATE**, We are pleasure to inform you that **Ms. H. Sathya Bala, Reg No: 20SPCS22** studying **Master of Computer Science** Final year has been done the project work at our concern on **"Crop Yield Prediction using Deep Reinforcement Learning"** during the period from February 2022 to May 2022.

During this period, we noticed her to be diligent, sincere and hardworking and she accomplished her task within stipulated deadline. We wish her for all future endeavors.

POSTULATE INFO TECH ★ Thoothukudi ★

PROJECT DIRECTOR

ABSTRACT

Predicting crop yield based on the environmental, soil, silt, nitrogen, clay, Obessive Complusive Order (OCD), Octopine Synthase Gene (OCS), PHH2O, sand, Soil Organic Carbon (SOC), Cation Exchange Capacity (CEC), water and crop parameters has been a potential research topic. Deep-learning-based models are broadly used to extract significant crop features for prediction. Deep RNN by combining the intelligence of CNN and RNN builds a complete crop yield prediction framework.

The proposed work constructs along with the several layers of CNN and RNN which includes the layers like batch normalization, max-pooling, dropout, time distributed flatten layer, flatten and dense layer. Our proposed method has high performance on predicting the crop yield. Our proposed method used for both the soyabeans and corn crop for predicting their yield.

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INTRODUCTION

OBJECTIVES

Crop yield prediction is based on the environmental factors and parameters. Deep RNN by combining the intelligence of CNN and RNN to build crop yield prediction framework. Our proposed crop yield prediction framework used for predicting both the soyabeans and corn crops for predicting their yield. Crop yield prediction is helpful for farmers, Capture the time dependencies of environmental factors and the genetic improvement of seeds. Yield prediction for untested environments without significant drop in the prediction accuracy. Deep learning is a form of machine learning that utilizes a neural network to transform a set of inputs into a set of outputs via an artificial neural network. Deep learning methods, often using supervised learning with labeled datasets, have been shown to solve tasks that involve handling complex, high-dimensional raw input data such as images, with less manual feature engineering than prior methods, enabling significant progress in several fields including computer vision and natural language processing. Deep reinforcement learning (deep RL) is a sub field of machine learning that combines reinforcement learning (RL) and deep learning. RL considers the problem of a computational agent learning to make decisions by trial and error. Deep RL incorporates deep learning into the solution, allowing agents to make decisions from unstructured input data without manual engineering of the state space.

Deep RL algorithms are able to take in very large inputs (e.g. every pixel rendered to the screen in a video game) and decide what actions to perform to optimize an objective (eg. maximizing the game score). Deep reinforcement learning has been used for a diverse set of applications including but not limited to robotics, video games, natural language processing, computer vision, education, transportation, finance and healthcare.

SYSTEM SPECIFICATION

In the system specification, the latest hardware and software specifications must be proposed to enable faster retrieval of the information the system specifications are involves three concepts.

- Software Requirements
- Hardware Requirements

The detailed Hardware and Software specifications are given below.

SOFTWARE REQUIREMENTS

- O/S : Windows 10.
- Language : python
- IDE : Anaconda3
- Data Set : Excel
- Tool : Spyder

HARDWARE REQUIREMENTS

- System : Pentium IV 2.4 GH
- Monitor : 15 VGA color
- Ram : 2GB
- Mouse : Logitech

PROJECT DESCRIPTION

The project entitled Crop Yield Prediction Using Deep Reinforcement Learning has following modules:

- Convolutional Neural Network
- Recurrent Neural Network

❖ **CNN (Convolutional Neural Network):**

In deep learning , a convolutional neural network is a class of deep neural network used in data recognition and processing that is specifically designed to process pixel data. CNNs are used to analyse the visual data. It has 6 layers. It contains,

i. Convolution layer
ii. Batch normalization layer
iii. Max pooling layer,
iv. Dropout layer
v. Flatten layer.
vi. Fully connected

(i) Convolution layer:

- The first layer of a Convolutional Neural Network is a always a Convolutional Layer. This layer is applies a filter only to the input data to extracts the features from the input data with the filter of particular size M*M.
- It gives the output as corners and edges of the input data.

(ii) Batch normalization layer:

- Batch normalization typically behaves differently in training mode and prediction mode.
- It resizes or rescales and re-center the data.

(iii) Max pooling layer:

- The largest element is taken from feature map. This layer reduces the spatial size of the features and reduces overfitting and provide abstract representation.
- The pooling layer usually serves as a bridge between the convolutional layer and the FC layer.

(iv) Drop out layer:

- Dropout is only used after the pooling, but this is just a rough heuristic. This layer prevents the model form overfitting.
- The dropout layers randomly sets input units to 0 with a frequency of rate at each step during training.
- The drop out layer only applies when training is set to true such that no values are dropped during inference.

(v) Time distributed flatten layer:

- This layer works with the time series data .
- Flattening is converting the data into a 1-dimensional array for inputting it to the next layer

(vi) Fully connected layer:

- The fully connected layer consists of the weights and biases along with the neurons between two different layers.
- The input data from the previous layers are flattened and fed to the FC layer.

CNN Advantage

- It automatically detects the important features without any human supervision.

❖ **RNN (Recurrent Neural Network) :**

RNNs are known as Recurrent Neural Network. RNN are a type of neural network where the output from the previous step is fed as input to the current step .RNN is a type of artificial neural network which uses sequential data or time series data. It has 2 layers. It contains,

- ✓ Flatten layer
- ✓ Dense layer

✧ **Flatten layer:**

- This layer collapses the spatial dimensions of the input into channel dimension 15.

✧ **Dense layer:**

- Dense layer is the regularly deeply connected neural network layer.
- Dense layer does below operation on the input and return the output. This layer collects all the output from the previous layer.

RNN Advantage

- RNN can process inputs of any length
- Even if the input size is larger, the mode size does not increase.

SYSTEM STUDY

Existing System

In Existing System aim to Constructed a Deep Recurrent Q-Network model which is a Recurrent Neural Network deep learning algorithm over the Q-Learning reinforcement learning algorithm to forecast the crop yield. The sequentially stacked layers of Recurrent Neural network is fed by the data parameters. Q-learning network constructs a crop yield prediction environment based on the input parameters. Linear layer maps the Recurrent Neural Network output values to the Q-values. Reinforcement learning agent incorporates a combination of parametric features with the threshold that assist in predicting crop yield. Finally, the agent receives an aggregate score for the actions performed by minimizing the error and maximizing the forecast accuracy.

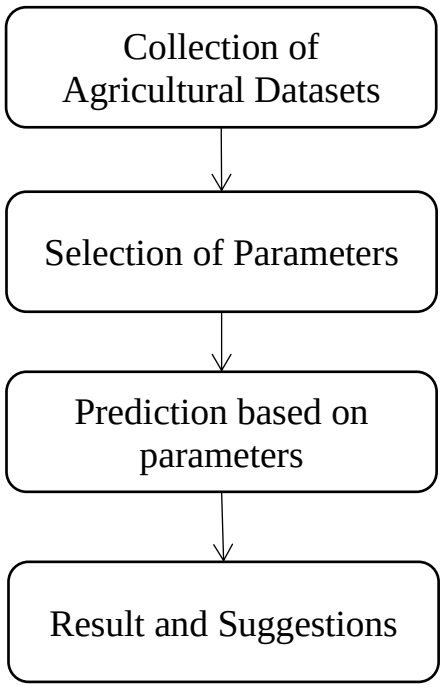
Disadvantages

It predict preserving the original data distribution within accuracy of 93.7%, so that improve in the computing efficiency of the training process is an intriguing .

Proposed System

Crop yield prediction Helpful for farmers. Capture the time dependencies of environmental factors and the genetic improvement of seeds.Yield prediction for untested environments without significant drop in the prediction accuracy.

Proposed Architecture



SYSTEM ANALYSIS

FEASIBILITY STUDY

The feasibility study of our proposed system can be analyzed in this section. In this system, it analyzes how the project objectives can be achieved successfully, accounting for internal and external influences that affect the project such as economic, technological, legal and time factors.

For this project, the factors considered include the following:

- How much investment is required for the development process?
- Are the skills required for developing this system?
- Is this system is technically provable?
- Will the final outcome of our proposed system be useful or usable?
- Will the proposed system is useful for major participants in the market?

TECHNICAL FEASIBILITY

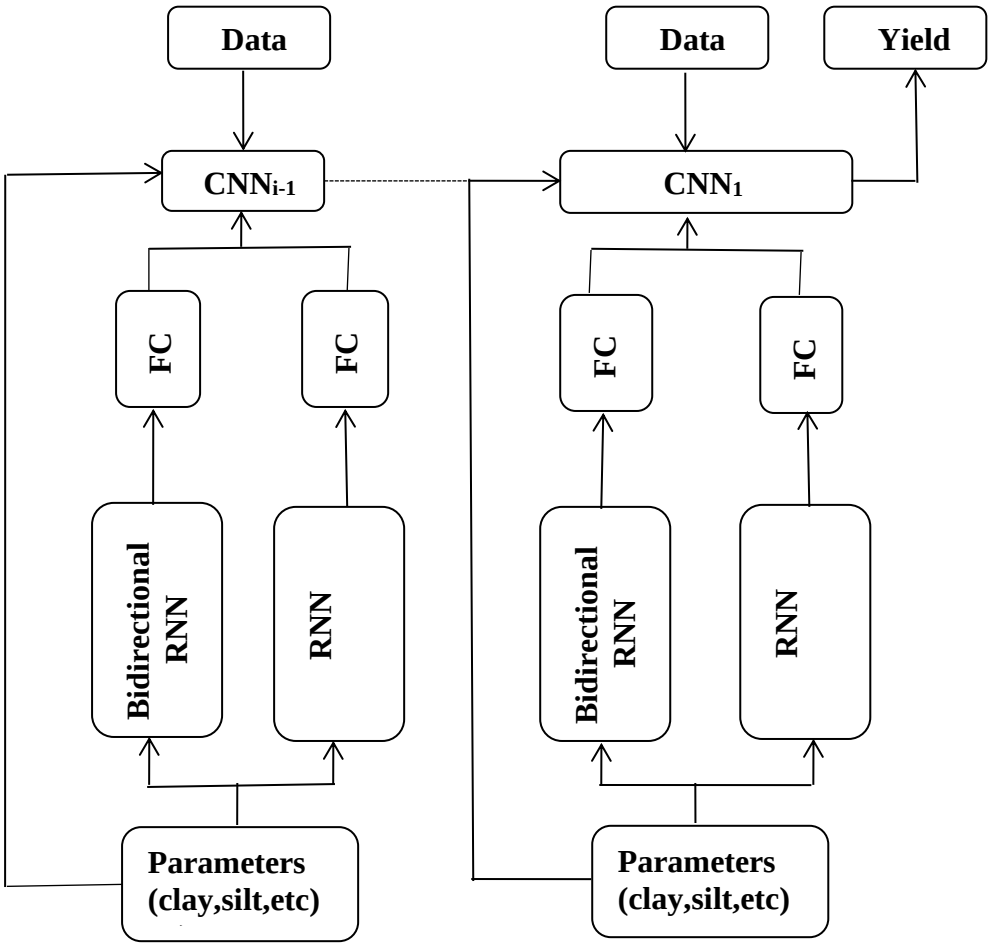
In this technical feasibility study, conducted a study whether the technical assumptions of this proposed system is provable, whether the technical requirements and milestones of the system can be achievable with the resources available. In this study, the quality and quantity of the developers or designers are also studied to make the proposed system and to check the both the development productivity and the skills of the programmers are enough sufficient for the development of the required proposed system.

ECONOMIC FEASIBILITY

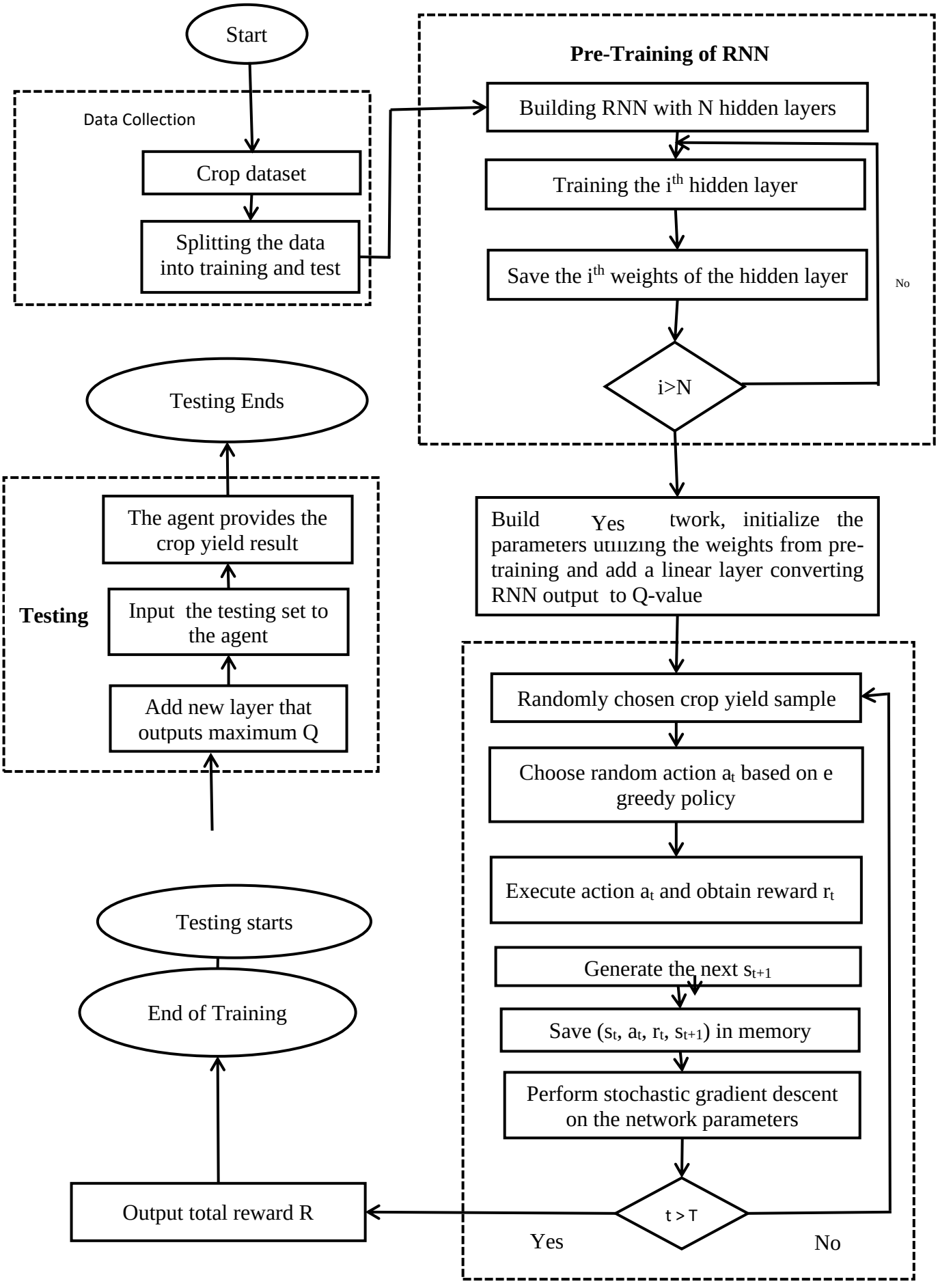
In this economic feasibility study, conducted a study based on the cost or financially benefit analysis of the required project. Economic feasibility study had performed as follows:

- How much capital and financial investment are available?
    - Software and hardware tools required for this project are free and open source. So, no capital investment is required. Need minimum financial requirements for internet subscriptions and these costs can be covered by the researcher.
    - The developer had required skills and no further training is required.
- How the project outcome is profitable?
    - This system detects and classifies the crop yielding in particular year. So, our proposed system is helpful in predicting the crop yield using the limited time and resources.

SYSTEM DESIGN



The flow diagram of the proposed deep recurrent Q-Network model for crop yield prediction.



SYSTEM TESTING

System Testing is a process, which reveals errors in the program. It is the major quality measure employed during software development. During testing, the program is executed with a set of conditions known as test cases and the output is evaluated to determine whether the program is performing as expected.

Software testing is the process of testing the functionality and correctness of software by running it. Process of executing a program with the intent of finding an error.

A good test case is one that has a high probability of finding an as yet undiscovered error. A successful test is one that uncovers an as yet undiscovered error. Software testing is usually performed for two reasons.

- ✓ Defect detection
- ✓ Reliability estimation

TESTING OBJECTIVE

- ❖ Testing is a process of executing a program with the intent of finding an error.
- ❖ A good test case is one that has a high probability of finding an as yet undiscovered.
- ❖ A successful test is one that uncovers an as yet undiscovered error.

TESTING PRINCIPLES

- ❖ All tests should be traceable to customer requirements.
- ❖ Tests should be planned large before testing begins.
- ❖ Testing should begin “In the Small” and progress towards “In the Large”.

TYPES OF TESTING

In order to make sure that the system does not have errors, the different levels of testing strategies that are applied at differing phases of software development are:

1.Unit Testing

- ➢ Unit Testing is done on individual modules as they are completed and become executable.
- ➢ It is confined only to the designer's requirements.
- ➢ Each module can be tested using the following two strategies:

i)Black Box Testing

In this strategy some test cases are generated as input conditions that fully execute all functional requirements for the program. This testing has been uses to find errors in the following categories:

a) Incorrect or missing functions

b) Interface errors

c) Errors in data structure or external database access

d) Performance errors

e) Initialization and termination errors.

In this testing only the output is checked for correctness. The logical flow of the data is not checked.

ii) White Box testing

In this the test cases are generated on the logic of each module by drawing flow graphs of that module and logical decisions are tested on all the cases.

It has been uses to generate the test cases in the following cases:

a) Guarantee that all independent paths have been executed.

b) Execute all logical decisions on their true and false sides.

c) Execute all loops at their boundaries and within their operational bounds.

d) Execute internal data structures to ensure their valid

OUTPUT TEST

The successful output screens are placed in the output screens section below.

EXPERIMENTAL RESULTS

Our crop yield prediction is compared using deep reinforcement learning method against Q learning. For a fair assessment, all of the compared methods use codes provided by their authors and set default parameters. To predicate crop yield for corn and soyabean. For the crop testing images, use 40 location data with different conditions for soyabean and corn use 39 location data with different condition. Use the different parameters like soil, slit, clay, ceo, phH2O in our method for all of the testing crop yield data. The experiment for all parameter are training them and testing each of the parameter. Here using CNN and RNN combined with Deep RL , their parameters and test.

CODING

CORN

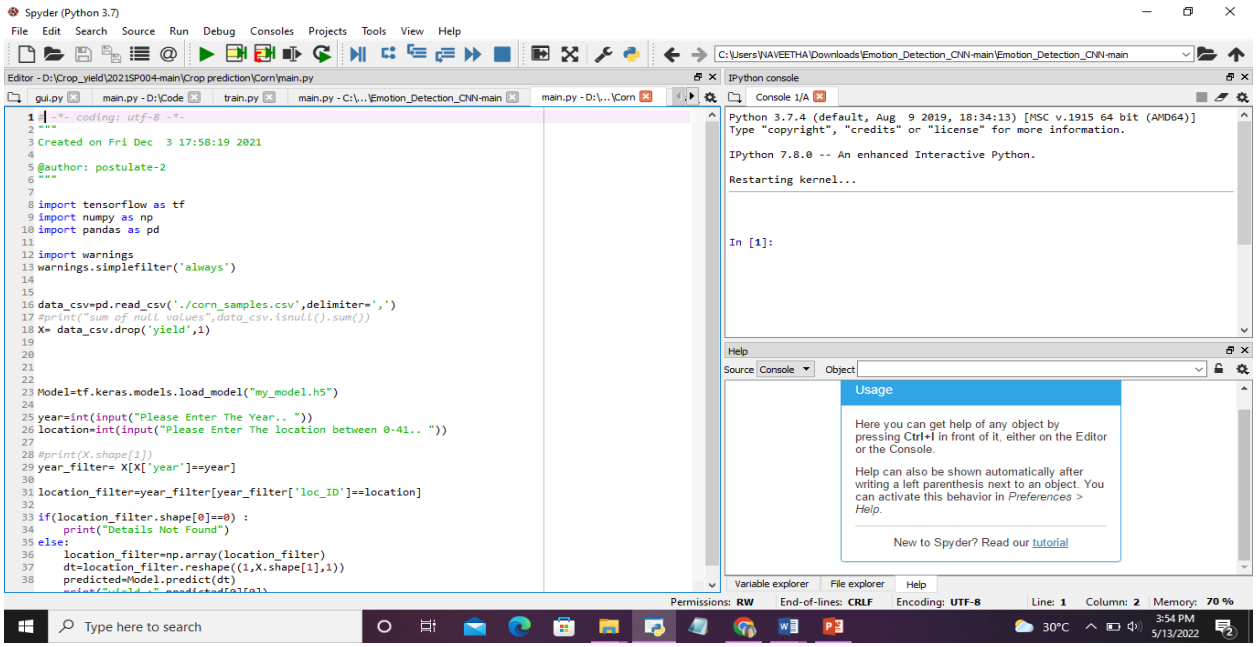
```
import tensorflow as tf
import numpy as np
import pandas as pd
import warnings
warnings.simplefilter('always')
data_csv=pd.read_csv('/content/drive/MyDrive/Colab
Notebooks/corn_samples.csv',delimiter=',')
#print("sum of null values",data_csv.isnull().sum())
X= data_csv.drop('yield',1)
Model=tf.keras.models.load_model("/content/drive/MyDrive/Colab
Notebooks/my_model_corn.h5")
year=int(input("Please Enter The Year.. "))
location=int(input("Please Enter The location between 0-41.. "))
#print(X.shape[1])
year_filter= X[X['year']==year]
location_filter=year_filter[year_filter['loc_ID']==location]
if(location_filter.shape[0]==0) :
print("Details Not Found")
else:
location_filter=np.array(location_filter)
dt=location_filter.reshape((1,X.shape[1],1))
predicted=Model.predict(dt)
print("yield :",predicted[0][0])
```

SOYABEAN

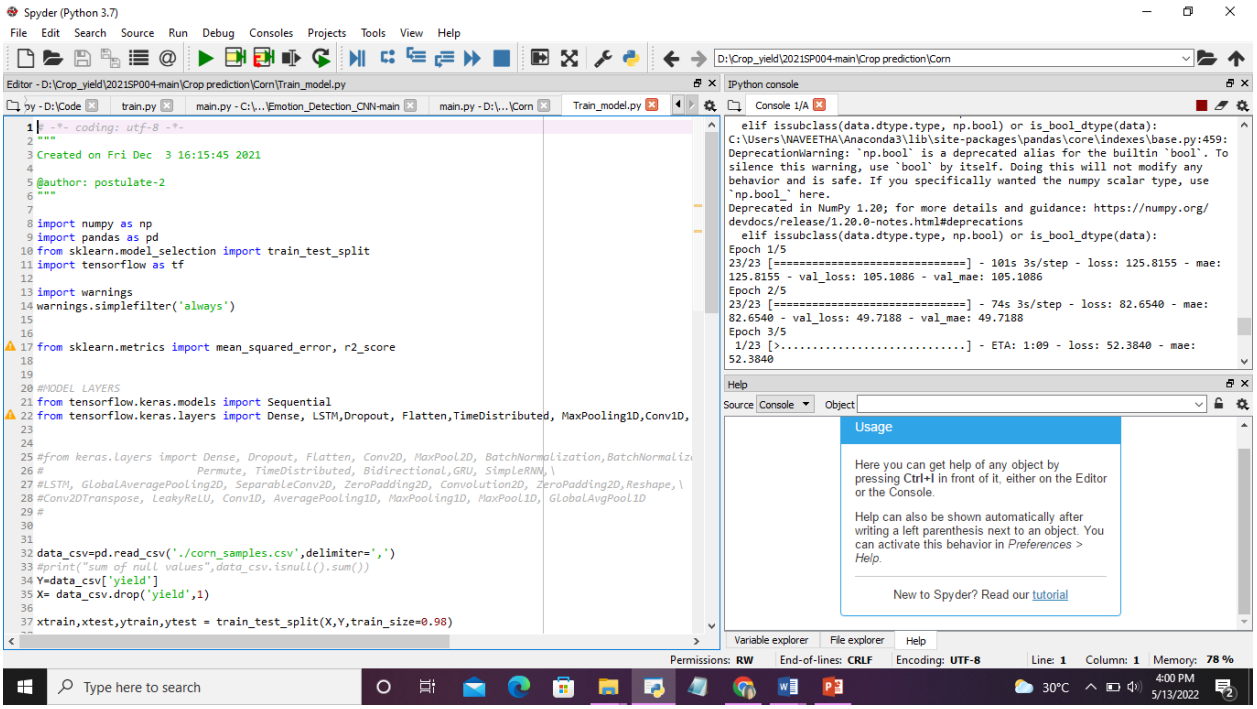
```
import tensorflow as tf
import numpy as np
import pandas as pd
import warnings
warnings.simplefilter('always')
data_csv=pd.read_csv('/content/drive/MyDrive/Colab
Notebooks/soybean_samples.csv',delimiter=',')
X= data_csv.drop('yield',1)
Model=tf.keras.models.load_model("/content/drive/MyDrive/Colab
Notebooks/my_model_soybeans.h5")
year=int(input("Please Enter The Year.. "))
location=int(input("Please Enter The location between 0-39.. "))
year_filter= X[X['year']==year]
location_filter=year_filter[year_filter['loc_ID']==location]
if(location_filter.shape[0]==0) :
print("Details Not Found")
else:
location_filter=np.array(location_filter)
dt=location_filter.reshape((1,394,1))
predicted=Model.predict(dt)
print("yield :",predicted[0][0])
```

SCREENSHOTS

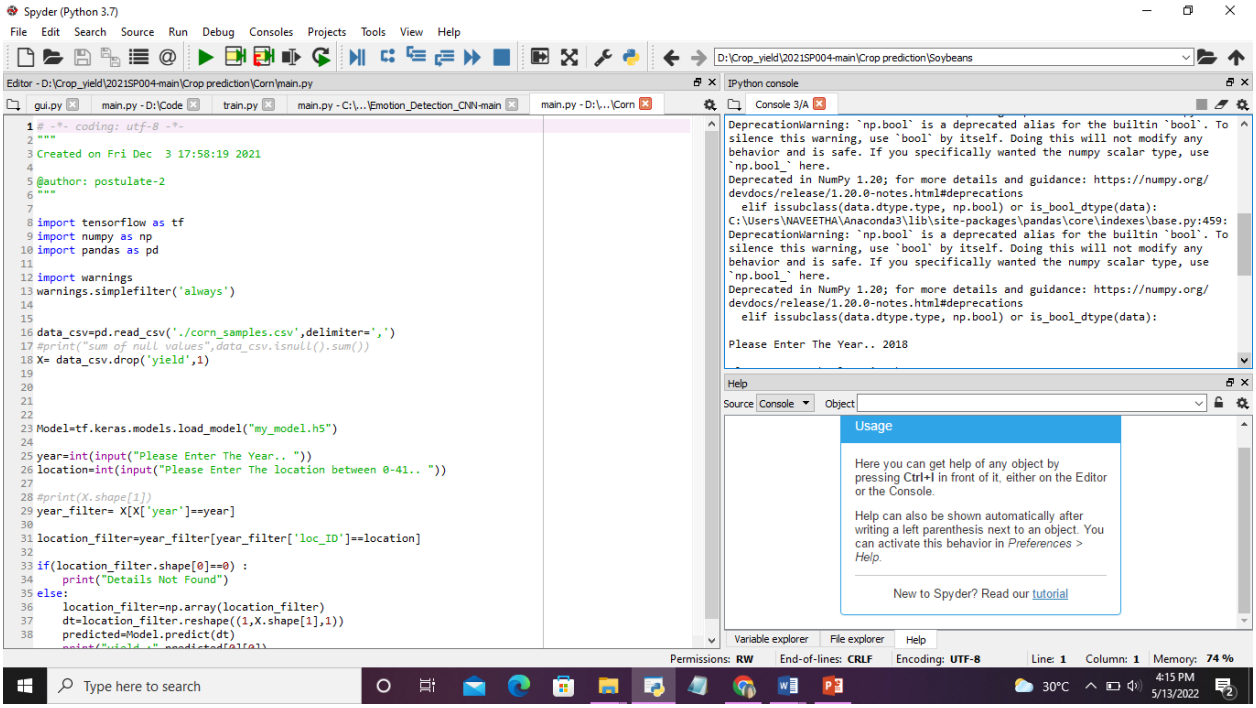
CORN:

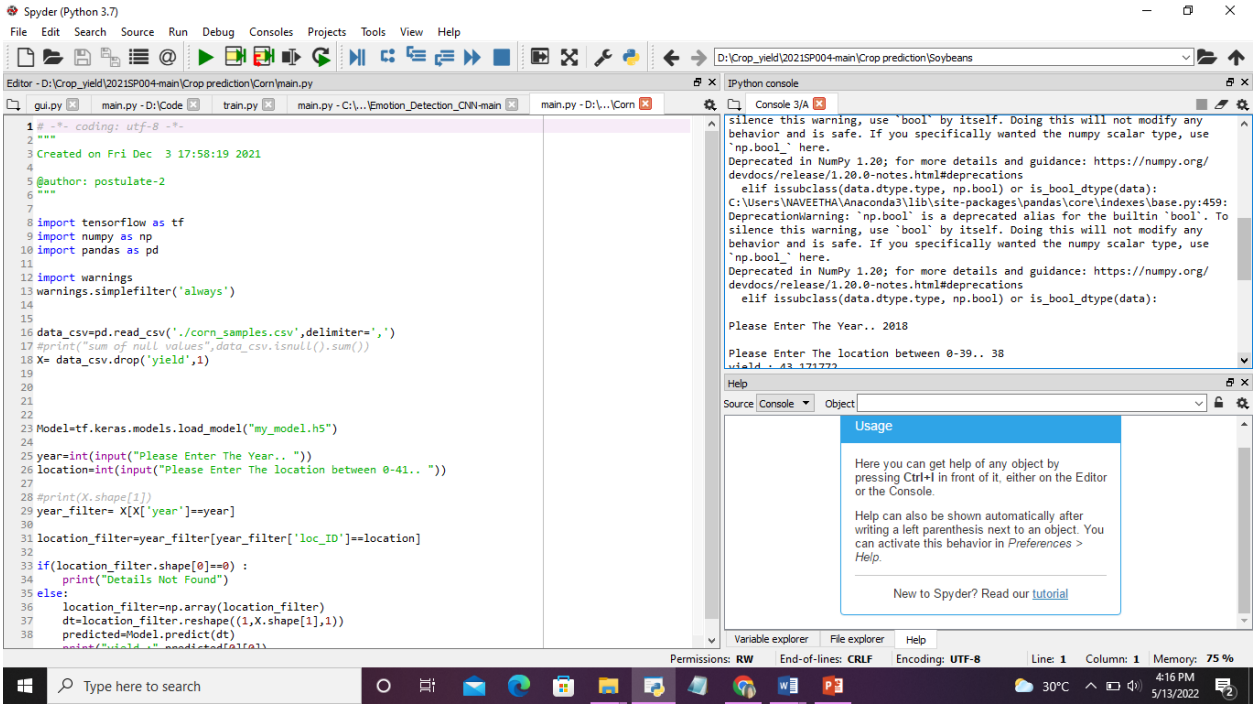


Train

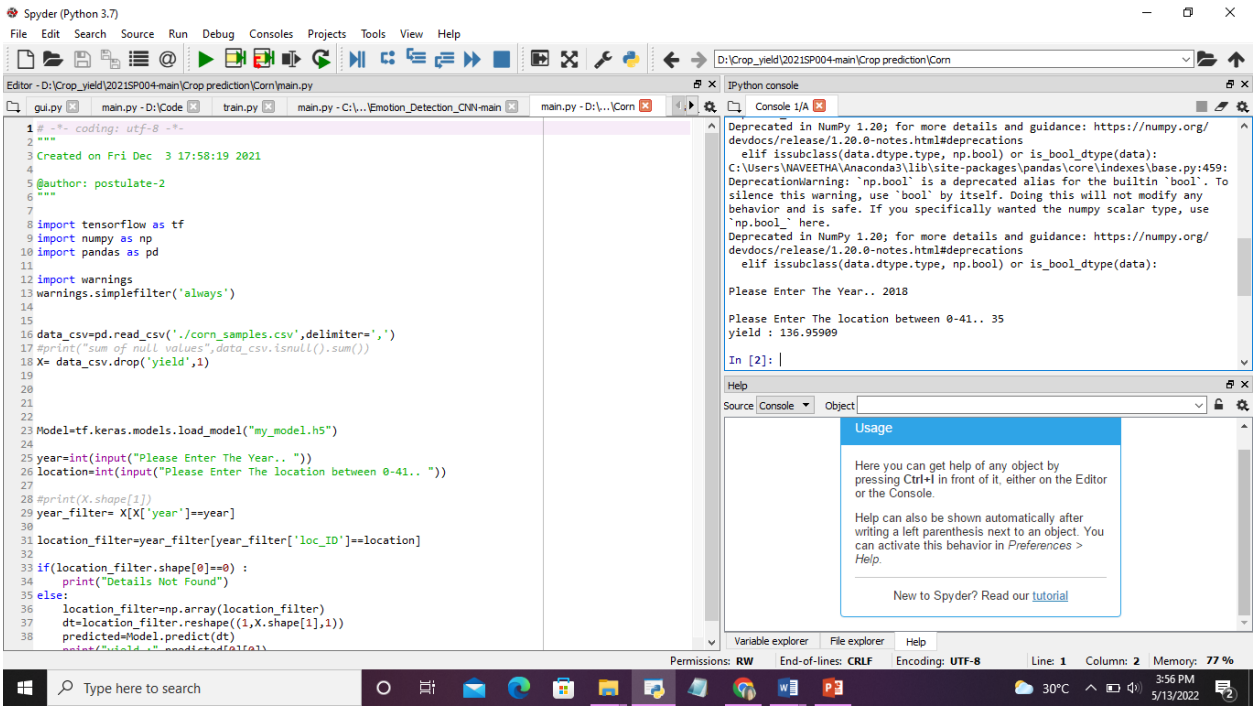


Test


Spyder (Python 3.7)
File Edit Search Source Run Debug Consoles Projects Tools View Help
Editor - D:\Crop_yield\2021SP004-main\Crop prediction\Corn\main.py
IPython console
Console 3/A
Help
Usage
Here you can get help of any object by pressing Ctrl+I in front of it, either on the Editor or the Console.
Help can also be shown automatically after writing a left parenthesis next to an object. You can activate this behavior in Preferences > Help.
New to Spyder? Read our tutorial
Variable explorer
File explorer
Help
Permissions: RW
End-of-lines: CRLF
Encoding: UTF-8
Line: 1
Column: 1
Memory: 74 %
Type here to search
30°C
4:15 PM
5/13/2022

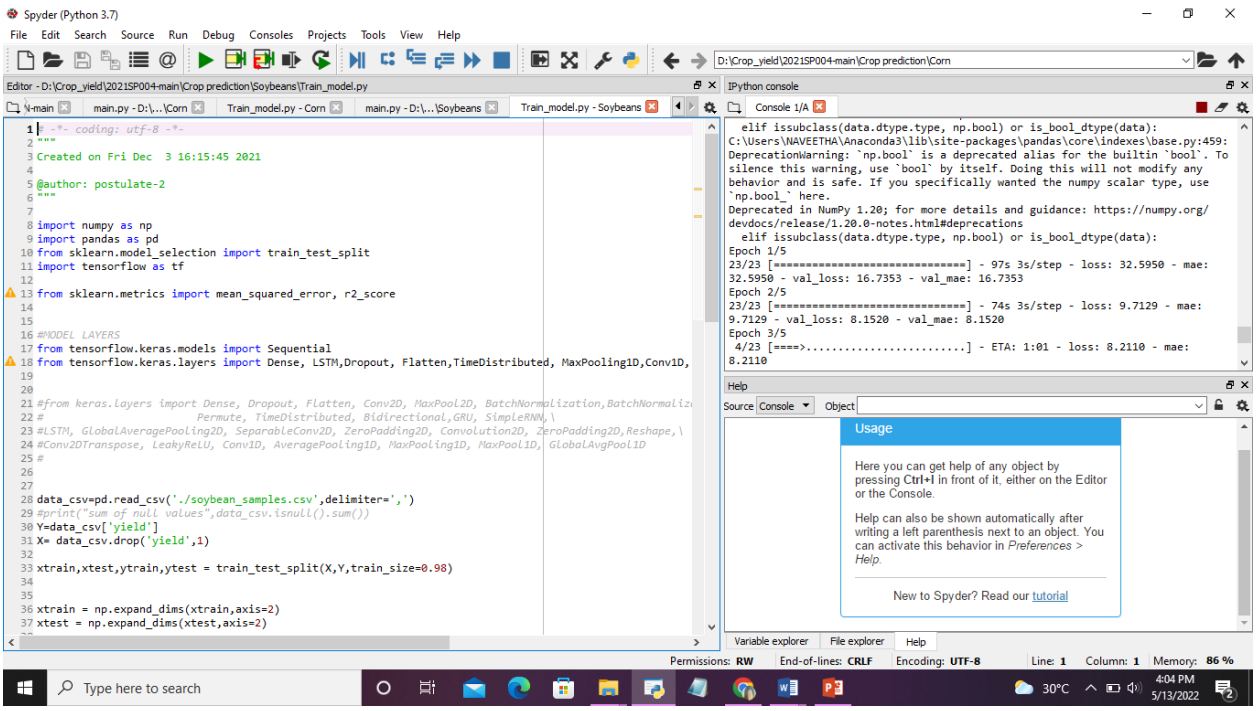

Spyder (Python 3.7)
File Edit Search Source Run Debug Consoles Projects Tools View Help
Editor - D:\Crop_yield\2021SP004-main\Crop prediction\Corn\main.py
IPython console
Console 3/A
Help
Usage
Here you can get help of any object by pressing Ctrl+I in front of it, either on the Editor or the Console.
Help can also be shown automatically after writing a left parenthesis next to an object. You can activate this behavior in Preferences > Help.
New to Spyder? Read our tutorial
Variable explorer
File explorer
Help
Permissions: RW
End-of-lines: CRLF
Encoding: UTF-8
Line: 1
Column: 1
Memory: 75 %
Type here to search
30°C
4:16 PM
5/13/2022

OUTPUT :

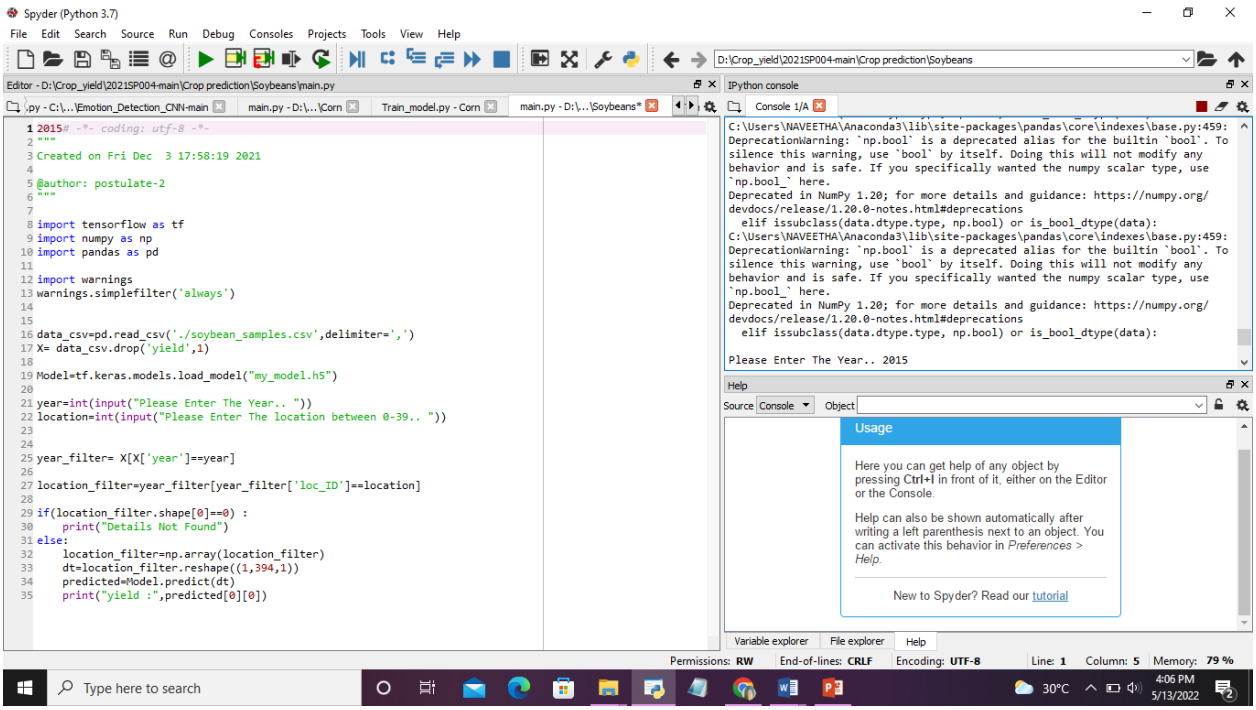


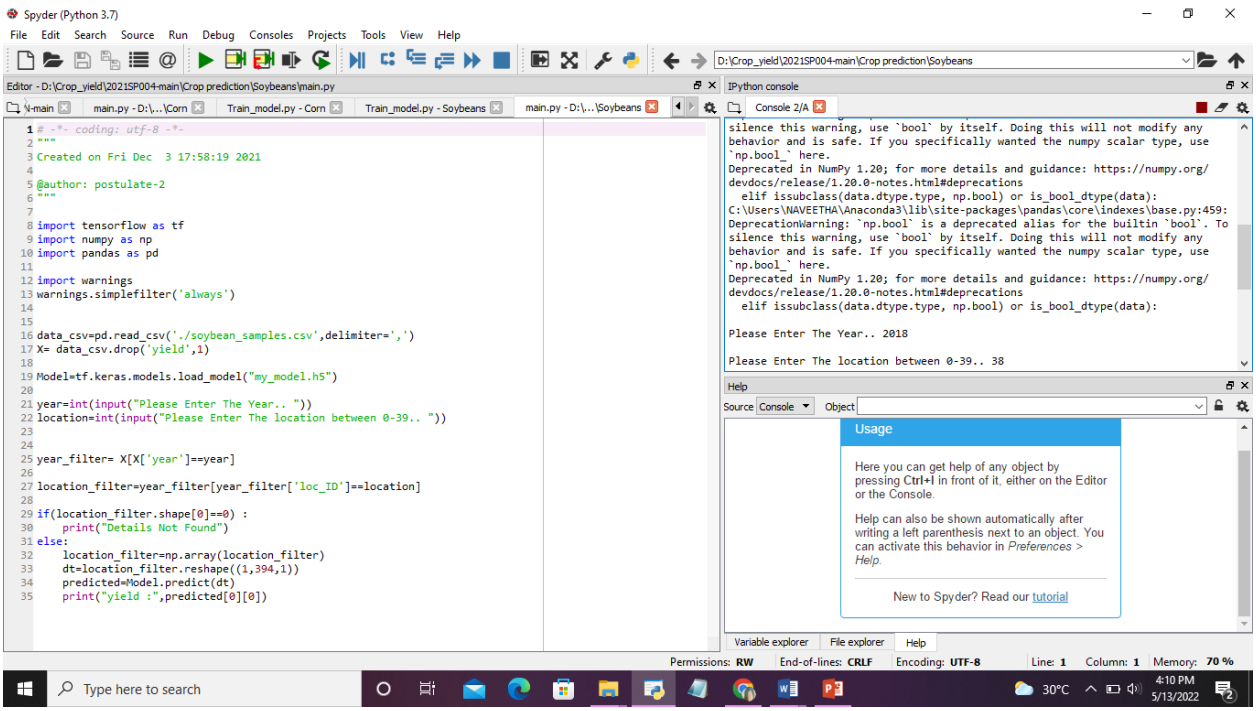
SOYABEANS:

Train

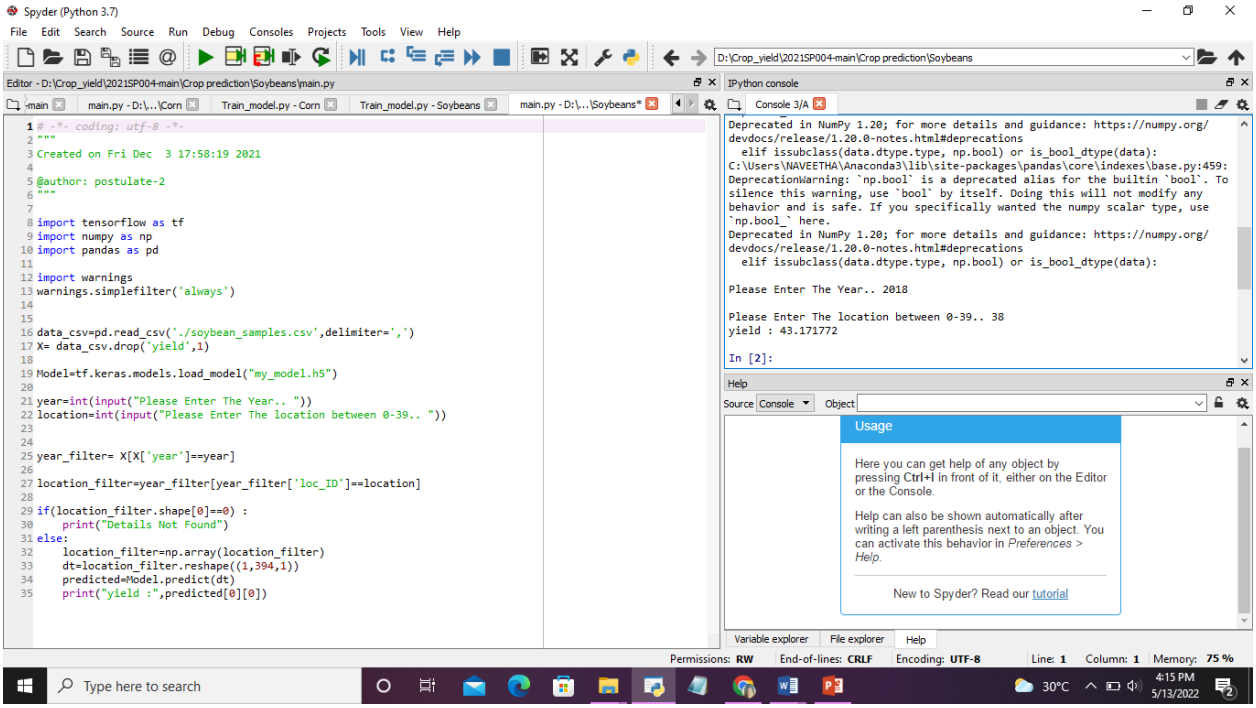


Test


Spyder (Python 3.7)
File Edit Search Source Run Debug Consoles Projects Tools View Help
D:\Crop_yield\2021SP004-main\Crop prediction\Soybeans
Editor - D:\Crop_yield\2021SP004-main\Crop prediction\Soybeans\main.py
IPython console
Console 1/A
2015# -*- coding: utf-8 -*-
"""
Created on Fri Dec 3 17:58:19 2021
@author: postulate-2
"""
import tensorflow as tf
import numpy as np
import pandas as pd
import warnings
warnings.simplefilter('always')
data_csv=pd.read_csv('./soybean_samples.csv',delimiter=',')
X= data_csv.drop('yield',1)
Model=tf.keras.models.load_model("my_model.h5")
year=int(input("Please Enter The Year.. "))
location=int(input("Please Enter The location between 0-39.. "))
year_filter= X[X['year']==year]
location_filter=year_filter[year_filter['loc_ID']==location]
if(location_filter.shape[0]==0) :
print("Details Not Found")
else:
location_filter=np.array(location_filter)
dt=location_filter.reshape((1,394,1))
predicted=Model.predict(dt)
print("yield :",predicted[0][0])
C:\Users\NAVEETHA\Anaconda3\lib\site-packages\pandas\core\indexes\base.py:459:
DeprecationWarning: `np.bool` is a deprecated alias for the builtin `bool`. To
silence this warning, use `bool` by itself. Doing this will not modify any
behavior and is safe. If you specifically wanted the numpy scalar type, use
`np.bool_` here.
Deprecated in NumPy 1.20; for more details and guidance: https://numpy.org/
devdocs/release/1.20.0-notes.html#deprecations
elif issubclass(data.dtype.type, np.bool) or is_bool_dtype(data):
C:\Users\NAVEETHA\Anaconda3\lib\site-packages\pandas\core\indexes\base.py:459:
DeprecationWarning: `np.bool` is a deprecated alias for the builtin `bool`. To
silence this warning, use `bool` by itself. Doing this will not modify any
behavior and is safe. If you specifically wanted the numpy scalar type, use
`np.bool_` here.
Deprecated in NumPy 1.20; for more details and guidance: https://numpy.org/
devdocs/release/1.20.0-notes.html#deprecations
elif issubclass(data.dtype.type, np.bool) or is_bool_dtype(data):
Please Enter The Year.. 2015
Help
Source Console Object
Usage
Here you can get help of any object by pressing Ctrl+I in front of it, either on the Editor or the Console.
Help can also be shown automatically after writing a left parenthesis next to an object. You can activate this behavior in Preferences > Help.
New to Spyder? Read our tutorial
Variable explorer File explorer Help
Permissions: RW End-of-lines: CRLF Encoding: UTF-8 Line: 1 Column: 5 Memory: 79 %
Type here to search
30°C
4:06 PM
5/13/2022


Spyder (Python 3.7)
File Edit Search Source Run Debug Consoles Projects Tools View Help
D:\Crop_yield\2021SP004-main\Crop prediction\Soybeans
Editor - D:\Crop_yield\2021SP004-main\Crop prediction\Soybeans\main.py
IPython console
Console 2/A
-*- coding: utf-8 -*-
"""
Created on Fri Dec 3 17:58:19 2021
@author: postulate-2
"""
import tensorflow as tf
import numpy as np
import pandas as pd
import warnings
warnings.simplefilter('always')
data_csv=pd.read_csv('./soybean_samples.csv',delimiter=',')
X= data_csv.drop('yield',1)
Model=tf.keras.models.load_model("my_model.h5")
year=int(input("Please Enter The Year.. "))
location=int(input("Please Enter The location between 0-39.. "))
year_filter= X[X['year']==year]
location_filter=year_filter[year_filter['loc_ID']==location]
if(location_filter.shape[0]==0) :
print("Details Not Found")
else:
location_filter=np.array(location_filter)
dt=location_filter.reshape((1,394,1))
predicted=Model.predict(dt)
print("yield :",predicted[0][0])
silence this warning, use `bool` by itself. Doing this will not modify any
behavior and is safe. If you specifically wanted the numpy scalar type, use
`np.bool_` here.
Deprecated in NumPy 1.20; for more details and guidance: https://numpy.org/
devdocs/release/1.20.0-notes.html#deprecations
elif issubclass(data.dtype.type, np.bool) or is_bool_dtype(data):
C:\Users\NAVEETHA\Anaconda3\lib\site-packages\pandas\core\indexes\base.py:459:
DeprecationWarning: `np.bool` is a deprecated alias for the builtin `bool`. To
silence this warning, use `bool` by itself. Doing this will not modify any
behavior and is safe. If you specifically wanted the numpy scalar type, use
`np.bool_` here.
Deprecated in NumPy 1.20; for more details and guidance: https://numpy.org/
devdocs/release/1.20.0-notes.html#deprecations
elif issubclass(data.dtype.type, np.bool) or is_bool_dtype(data):
Please Enter The Year.. 2018
Please Enter The location between 0-39.. 38
Help
Source Console Object
Usage
Here you can get help of any object by pressing Ctrl+I in front of it, either on the Editor or the Console.
Help can also be shown automatically after writing a left parenthesis next to an object. You can activate this behavior in Preferences > Help.
New to Spyder? Read our tutorial
Variable explorer File explorer Help
Permissions: RW End-of-lines: CRLF Encoding: UTF-8 Line: 1 Column: 1 Memory: 70 %
Type here to search
30°C
4:10 PM
5/13/2022

OUTPUT :


Spyder (Python 3.7)
File Edit Search Source Run Debug Consoles Projects Tools View Help
Editor - D:\Crop_yield\2021SP004-main\Crop prediction\Soybeans\main.py
IPython console
Console 3/A
-*- coding: utf-8 -*-
"""
Created on Fri Dec 3 17:58:19 2021
@author: postulate-2
"""
import tensorflow as tf
import numpy as np
import pandas as pd
import warnings
warnings.simplefilter('always')
data_csv=pd.read_csv('./soybean_samples.csv',delimiter=',')
X= data_csv.drop('yield',1)
Model=tf.keras.models.load_model("my_model.h5")
year=int(input("Please Enter The Year.. "))
location=int(input("Please Enter The location between 0-39.. "))
year_filter= X[X['year']==year]
location_filter=year_filter[year_filter['loc_ID']==location]
if(location_filter.shape[0]==0) :
print("Details Not Found")
else:
location_filter=np.array(location_filter)
dt=location_filter.reshape((1,394,1))
predicted=Model.predict(dt)
print("yield :",predicted[0][0])
Please Enter The Year.. 2018
Please Enter The location between 0-39.. 38
yield : 43.171772
In [2]:
Usage
Here you can get help of any object by pressing Ctrl+I in front of it, either on the Editor or the Console.
Help can also be shown automatically after writing a left parenthesis next to an object. You can activate this behavior in Preferences > Help.
New to Spyder? Read our tutorial
Variable explorer
File explorer
Help
Permissions: RW
End-of-lines: CRLF
Encoding: UTF-8
Line: 1
Column: 1
Memory: 75 %
Type here to search
30°C
4:15 PM
5/13/2022

CONCLUSION

We presented a machine learning approach for crop yield prediction. The approach used deep neural networks to make yield predictions based on environment data. The carefully designed deep neural networks were able to learn nonlinear and complex relationships between genes, environmental conditions, as well as their interactions from historical data and make reasonably accurate predictions of yields for new hybrids planted in new locations with known weather conditions. Performance of the model was found to be relatively sensitive to the quality of weather prediction, which suggested the importance of weather prediction techniques. A major limitation of the proposed model is its black box property, which is shared by many machine learning methods. The feature selection approach successfully found important features, and revealed that environmental factors had a greater effect on the crop yield than genotype.

FUTURE ENHANCEMENT

Whenever time and technology changes everything needs to be changed as enhanced. In future the system can be expanded in the following services. The system is developed in such a way that any further modification to system can be achieved without any great alteration in program structure. Our future research is to overcome this limitation by looking for more advanced models that are not only more accurate but also more explainable. In future the work is to predict and extract the crop yield with an extended algorithm for more advanced and intelligent way of learning and predicting the results. This system can further extend to finding the yields with less discriminative data and high prediction power.

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