

GAMIFIED TOOL FOR TEACHING CYBERSECURITY

Design Manual

Author: Patrick Alabi

Student ID: C00224965

Project Supervisor: James Egan

Contents

1) Introduction	3
2) Operation Flow Diagram	4
3) Sequence Diagram	5
4) Use Case	6
5) Front-End Layout	7
Registration:	8
XML Code:	9
Login Page:	12
XML Code:	13
Home Page/Menu Screen:	16
XML Code:	17
Exam:	22
6) Database	22

1) Introduction

This document will provide the reader with a better understanding of how the application will be developed. The reader will have a more in depth understanding of how the design of the application will be implemented. This document will focus on the internal and the user interface.

I will be focusing on a few sections for this document; front-end, database and UML diagrams. The front-end section of this document will be covering the user interface and how the visual layout editor will be utilized in Android Studio and how the navigation of the application will work.

The database section will provide a broad overview of how the database will be used in the overall project. The technology stack will give a description of the languages and IDE used to implement the features of this application. UML diagrams will go more in depth than the functional specification to give the reader a better understanding.

2) Operation Flow Diagram

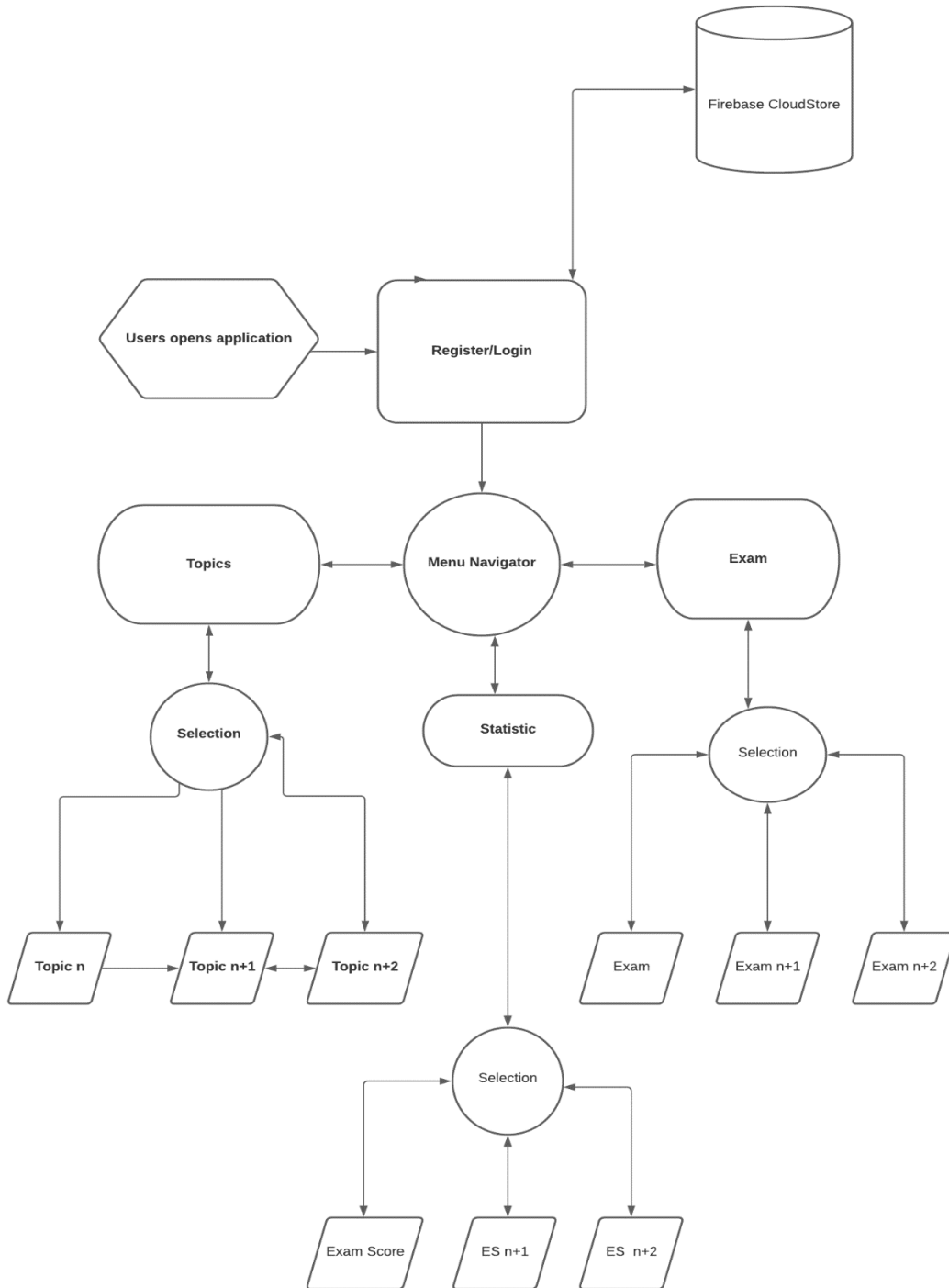


Figure 2 – Operational Flow Diagram

The use of the operation flow diagram is to show the paths the user will be using to navigate through the application. The user will operate from the homepage as far the last topic of what they are studying.

3) Sequence Diagram

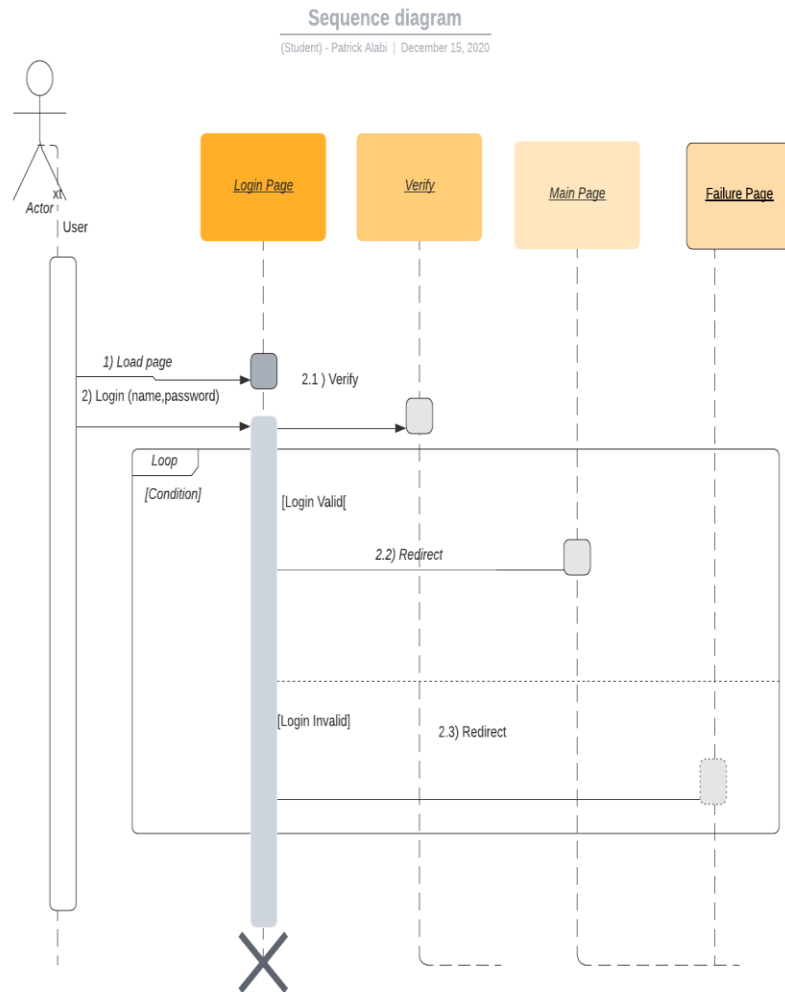
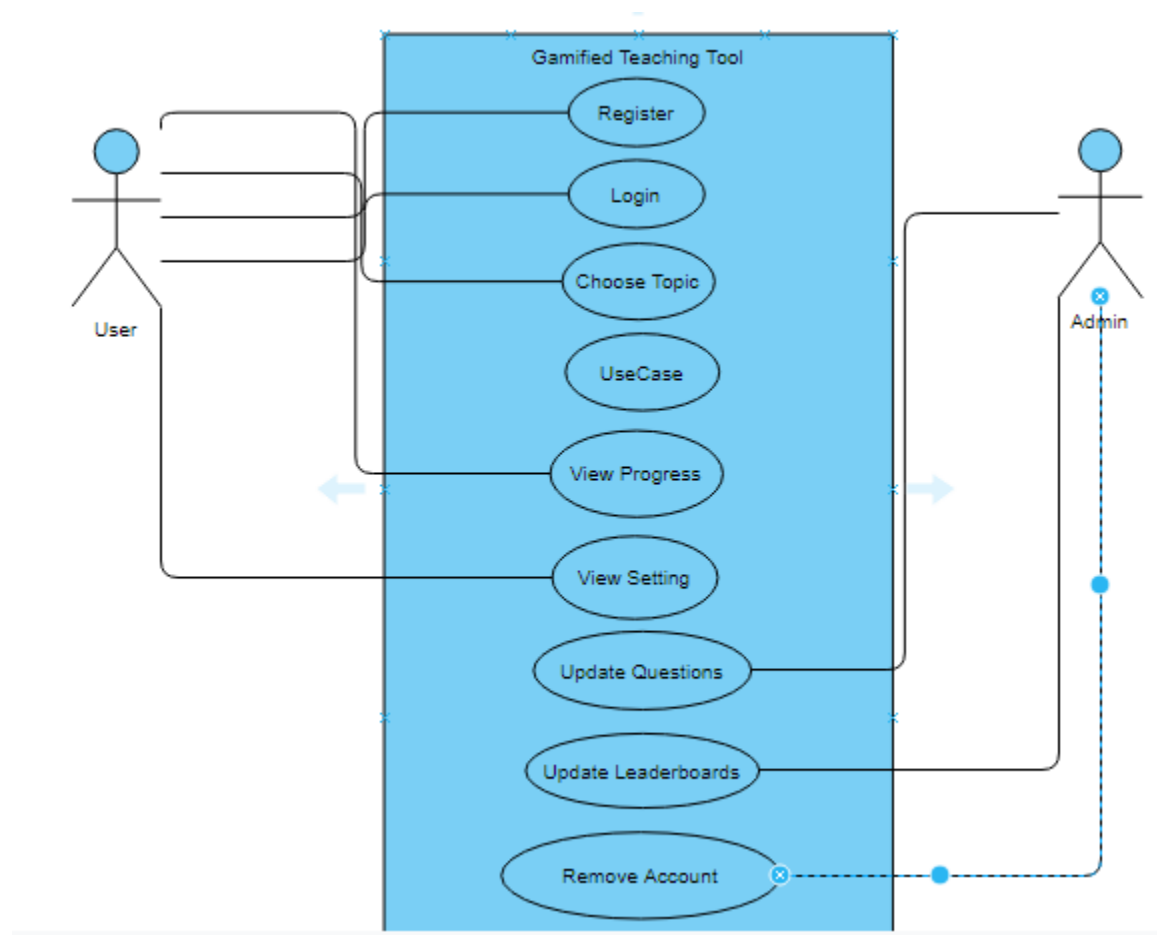


Figure 3 – Sequence Diagram Example

4) Use Case



5) Front-End Layout

Splash Screen/Landing Page:

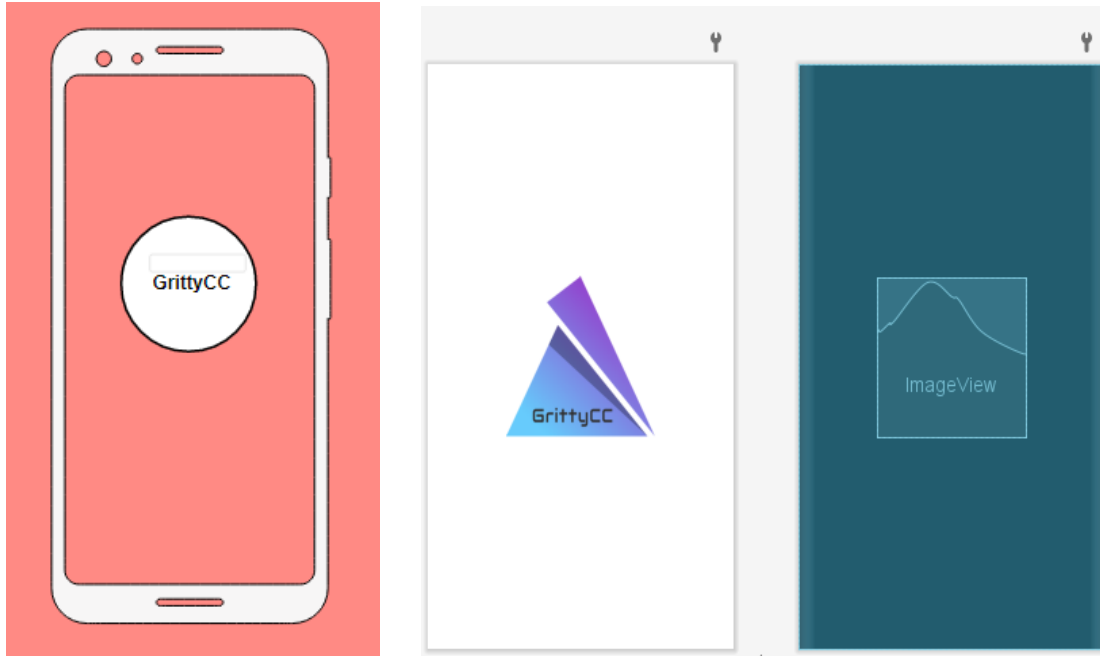


Figure 5.1.1 – Splash screen front end layout.

In the above figure, the user will see this landing page once the application opens up. The landing page will load the application logo and then boot into the home page for the user. This is also known as the splash screen.

XML Code:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center"
    android:background="@color/white"
    tools:context=".SplashActivity">

    <ImageView
        android:layout_width="200dp"
        android:layout_height="200dp"
        android:scaleType="fitXY"
        android:src="@drawable/ic_logo"/>

</LinearLayout>
```

The logo for the application was created with an online icon generator. A linear layout is used in the xml of the splash screen activity. The background colour is white because I felt it would contrast the icon/logo really well and looks very user friendly. The 200 x 200 icon sits in the middle of the background and loads for approximately 5 seconds before booting into the registration/login screen.

Registration:

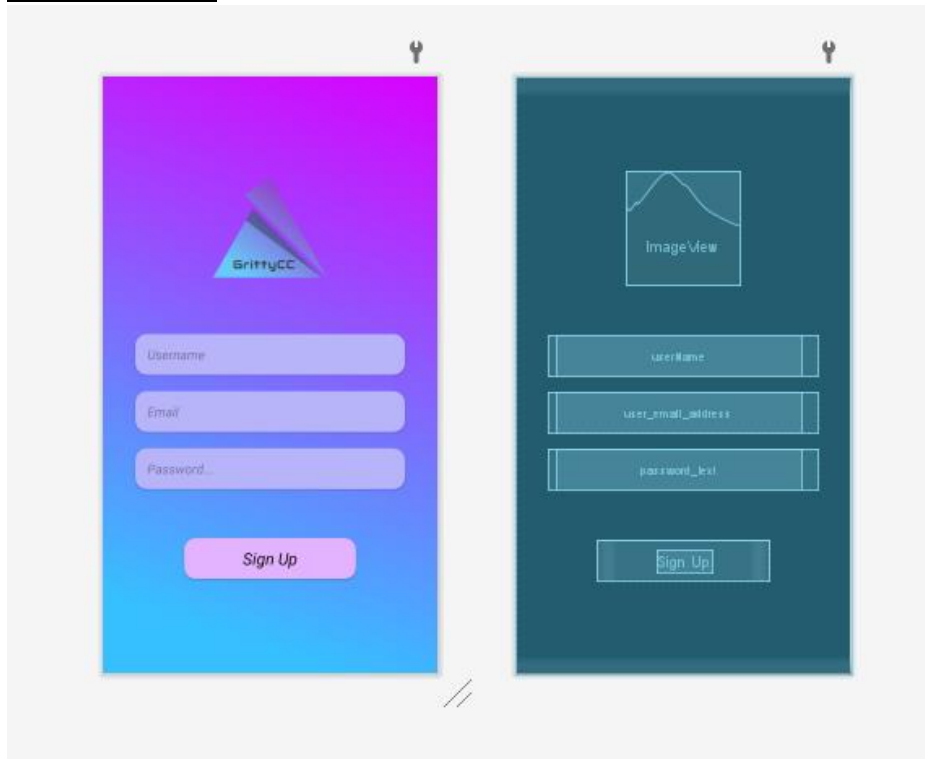


Figure 5.1.2 – Sign Up/ Register GUI Front-end Layout.

XML Code:

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="@drawable/ic_background"
    android:gravity="center"
    android:orientation="vertical"
    tools:context=".SignUpActivity">
    <ImageView
        android:layout_width="140dp"
        android:layout_height="140dp"
        android:src="@drawable/ic_logo" />
    <androidx.cardview.widget.CardView
        android:layout_width="match_parent"
        android:layout_height="50dp"
        android:layout_marginStart="40dp"
        android:layout_marginTop="60dp"
        android:layout_marginEnd="40dp"
        app:cardBackgroundColor="@color/edit_text_bg"
        app:cardCornerRadius="14dp">
        <EditText
            android:id="@+id/userName"
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:layout_marginStart="10dp"
            android:layout_marginEnd="20dp"
            android:maxLength="20"
            android:background="@null"
            android:padding="5dp"
            android:textSize="16sp"
            android:hint="Username"
            android:inputType="textCapSentences"
            android:textStyle="italic" />
    </androidx.cardview.widget.CardView>
    <androidx.cardview.widget.CardView
        android:layout_width="match_parent"
        android:layout_height="50dp"
        android:layout_marginStart="40dp"
        android:layout_marginTop="20dp"
        android:layout_marginEnd="40dp"
        app:cardBackgroundColor="@color/edit_text_bg"
        app:cardCornerRadius="14dp">

```

```
<EditText
    android:id="@+id/user_email_address"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_marginStart="10dp"
    android:layout_marginEnd="20dp"
    android:maxLength="30"
    android:background="@null"
    android:padding="5dp"
    android:textSize="16sp"
    android:hint="Email"
    android:inputType="textEmailAddress"
    android:textStyle="italic" />

</androidx.cardview.widget.CardView>

<androidx.cardview.widget.CardView
    android:layout_width="match_parent"
    android:layout_height="50dp"
    android:layout_marginStart="40dp"
    android:layout_marginTop="20dp"
    android:layout_marginEnd="40dp"
    app:cardBackgroundColor="@color/edit_text_bg"
    app:cardCornerRadius="14dp">
```

```

<EditText
    android:id="@+id/password_text"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_marginStart="10dp"
    android:layout_marginEnd="20dp"
    android:background="@null"
    android:hint="Password..."
    android:maxLength="15"
    android:padding="5dp"
    android:textSize="16sp"
    android:inputType="textPassword"
    android:maxLines="1"
    android:textStyle="italic" />

</androidx.cardview.widget.CardView>

<androidx.cardview.widget.CardView
    android:layout_width="match_parent"
    android:layout_height="50dp"
    android:layout_marginStart="100dp"
    android:layout_marginTop="60dp"
    android:layout_marginEnd="100dp"
    app:cardBackgroundColor="@color/button_bg"
    app:cardCornerRadius="14dp">

    <LinearLayout
        android:id="@+id/sign_up_user"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:gravity="center"
        >

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Sign Up"
            android:textSize="20dp"
            android:textColor="@color/black"
            android:textStyle="italic|normal"/>
    </LinearLayout>

</androidx.cardview.widget.CardView>

</LinearLayout>

```

Figure 5.1.3 – The XML code for the registration of the application

The XML for the registration screen uses a `LinearLayout`, `ImageView` and the use of a `CardView` for the user input such as email address, username, password text and the button for signup. The UI palette of the registration are warm colours that match the logo and contrast the fields and buttons accordingly.

Login Page:

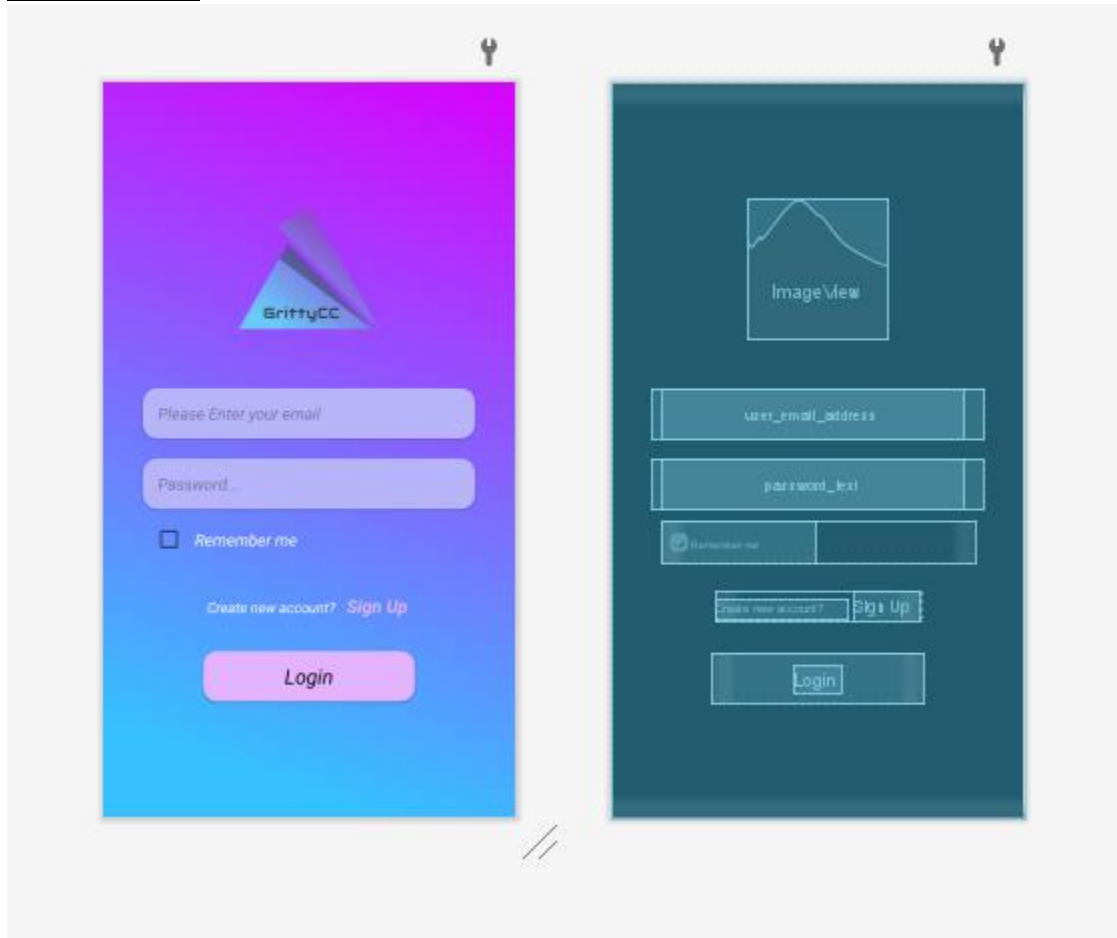


Figure 5.1.4 – Login front end layout.

XML Code:

```

1  <?xml version="1.0" encoding="utf-8"?>
2  <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
3      xmlns:app="http://schemas.android.com/apk/res-auto"
4      xmlns:tools="http://schemas.android.com/tools"
5      android:layout_width="match_parent"
6      android:layout_height="match_parent"
7      android:background="@drawable/ic_background"
8      android:gravity="center"
9      android:orientation="vertical"
10     tools:context=".LoginActivity">
11
12     <ImageView
13         android:layout_width="140dp"
14         android:layout_height="140dp"
15         android:src="@drawable/ic_logo" />
16
17     <androidx.cardview.widget.CardView
18         android:layout_width="match_parent"
19         android:layout_height="50dp"
20         android:layout_marginStart="40dp"
21         android:layout_marginTop="50dp"
22         android:layout_marginEnd="40dp"
23         app:cardBackgroundColor="@color/edit_text_bg"
24         app:cardCornerRadius="14dp">
25
26         <EditText
27             android:id="@+id/user_email_address"
28             android:layout_width="match_parent"
29             android:layout_height="match_parent"
30             android:layout_marginStart="10dp"
31             android:layout_marginEnd="20dp"
32             android:background="@null"
33             android:maxLength="35"
34             android:padding="5dp"
35             android:textSize="16sp"
36             android:hint="Please Enter your email"
37             android:inputType="textEmailAddress"
38             android:textStyle="italic" />
39     </androidx.cardview.widget.CardView>
40
41     <androidx.cardview.widget.CardView
42         android:layout_width="match_parent"
43         android:layout_height="50dp"
44         android:layout_marginStart="40dp"
45         android:layout_marginTop="20dp"
46         android:padding="5dp"
47         android:layout_marginEnd="40dp"
48         app:cardBackgroundColor="@color/edit_text_bg"
49         app:cardCornerRadius="14dp">

```

```
<EditText
    android:id="@+id/password_text"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_marginStart="10dp"
    android:layout_marginEnd="20dp"
    android:background="@null"
    android:hint="Password..."
    android:padding="5dp"
    android:maxLength="20"
    android:textSize="16sp"
    android:inputType="textPassword"
    android:maxLines="1"
    android:textStyle="italic" />
</androidx.cardview.widget.CardView>

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginStart="50dp"
    android:layout_marginEnd="50dp"
    android:layout_marginTop="10dp"
    android:orientation="horizontal"
    >
    <CheckBox
        android:id="@+id/check_remember"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Remember me"
        android:textColor="@color/white"
        android:textStyle="italic"
        android:padding="10dp"
        android:textSize="16sp"/>
</LinearLayout>
```

```

<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="30dp"
    android:orientation="horizontal">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Create new account? "
        android:textColor="@color/white"
        android:textStyle="italic"
        android:textSize="14dp"
        android:layout_marginEnd="5dp"/>

    <TextView
        android:id="@+id/go_to_sign_up"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Sign Up"
        android:padding="3dp"
        android:textStyle="bold|italic"
        android:textSize="18dp"
        android:textColor="@color/button_bg"
    />
</LinearLayout>

<androidx.cardview.widget.CardView
    android:layout_width="match_parent"
    android:layout_height="50dp"
    android:layout_marginStart="100dp"
    android:layout_marginTop="30dp"
    android:layout_marginEnd="100dp"
    app:cardBackgroundColor="@color/button_bg"
    app:cardCornerRadius="14dp">

    <LinearLayout
        android:id="@+id/login_btn"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:gravity="center"
        >

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Login"
            android:textSize="20dp"
            android:textColor="@color/black"
            android:textStyle="italic|normal"/>
    </LinearLayout>

</androidx.cardview.widget.CardView>

</LinearLayout>

```

Figure 5.1.5 - XML code of the Login Page.

The XML for the registration screen uses a LinearLayout, ImageView and the use of a CardView for the user input such as email address, password text, remember me button and the button for login. The UI palette of the login are warm colours that match the logo and contrast the fields and buttons.

Home Page/Menu Screen:

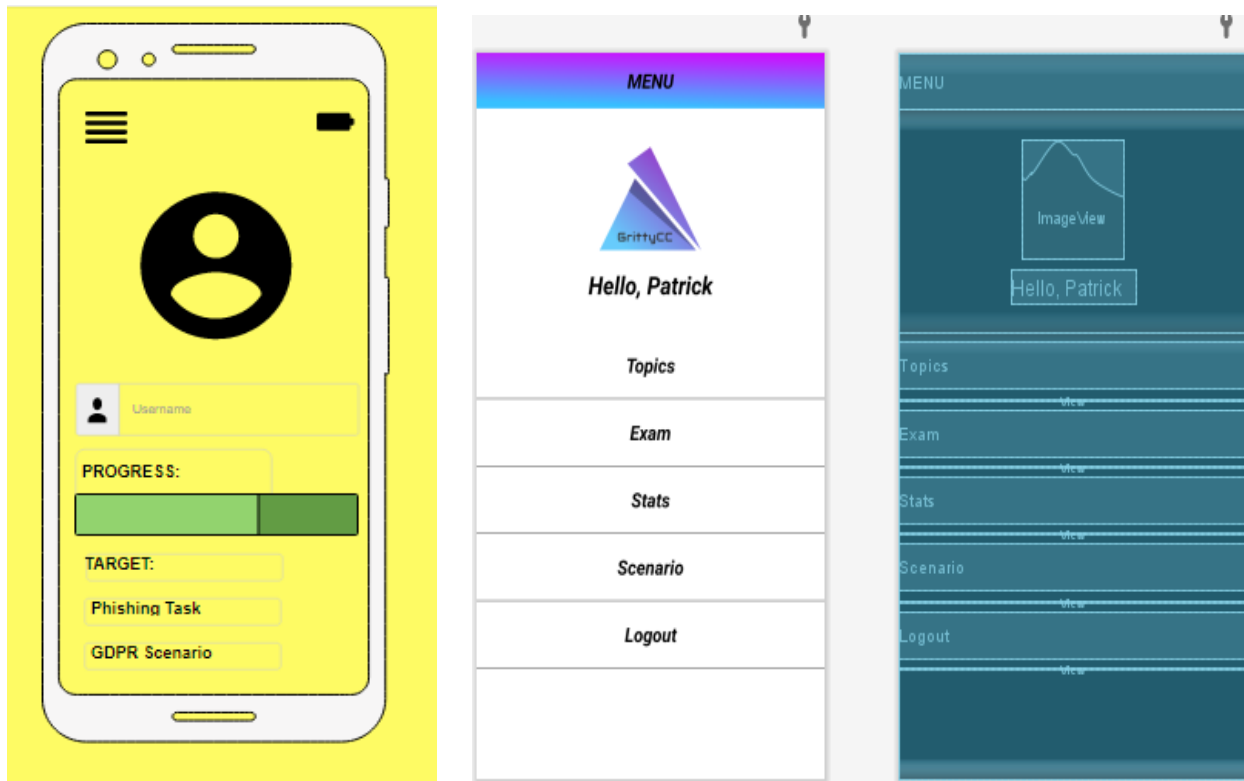


Figure 5.1.6 Mock-up Wireframe of the home page of the application with the final design beside it.

XML Code:

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:background="@color/white"
    tools:context=".MenuActivity">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="?actionBarSize"
        android:text="MENU"
        android:gravity="center"
        android:textSize="20sp"
        android:textStyle="bold|italic"
        android:textColor="@color/black"
        android:background="@drawable/ic_background"/>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="0dp"
            android:gravity="center"
            android:orientation="vertical"
            android:layout_weight="1.5">

```

```
    <ImageView
        android:layout_width="120dp"
        android:layout_height="120dp"
        android:src="@drawable/ic_logo"
        android:layout_marginBottom="10dp"/>

    <TextView
        android:id="@+id/login_user_name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello, Patrick"
        android:textSize="25sp"
        android:textColor="@color/black"
        android:textStyle="italic|bold"
        />

</LinearLayout>

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="0dp"
    android:gravity="center_horizontal"
    android:orientation="vertical"

    android:layout_weight="3">
```

```
<TextView
```

```
    android:id="@+id/go_to_topic_screen"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:layout_marginTop="10dp"  
    android:layout_marginBottom="10dp"  
    android:text="Topics"  
    android:gravity="center"  
    android:padding="10dp"  
    android:textSize="20sp"  
    android:textColor="@color/black"  
    android:textStyle="bold|italic"/>
```

```
<View
```

```
    android:layout_width="match_parent"  
    android:layout_height="1dp"  
    android:background="@color/gray"/>
```

```
<TextView
```

```
    android:id="@+id/go_to_exam_screen"  
  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:layout_marginTop="10dp"  
    android:layout_marginBottom="10dp"  
    android:text="Exam"  
    android:gravity="center"  
    android:padding="10dp"  
    android:textSize="20sp"  
    android:textColor="@color/black"  
    android:textStyle="bold|italic"/>
```

```

<View
    android:layout_width="match_parent"
    android:layout_height="1dp"
    android:background="@color/gray"/>
<TextView
    android:id="@+id/go_to_stats_screen"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:layout_marginBottom="10dp"
    android:text="Stats"
    android:gravity="center"
    android:padding="10dp"
    android:textSize="20sp"
    android:textColor="@color/black"
    android:textStyle="bold|italic"/>

```

```

<View
    android:layout_width="match_parent"
    android:layout_height="1dp"
    android:background="@color/gray"/>
<TextView
    android:id="@+id/go_to_scenario_screen"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:layout_marginBottom="10dp"
    android:text="Scenario"
    android:gravity="center"
    android:padding="10dp"
    android:textSize="20sp"
    android:textColor="@color/black"
    android:textStyle="bold|italic"/>

```

```

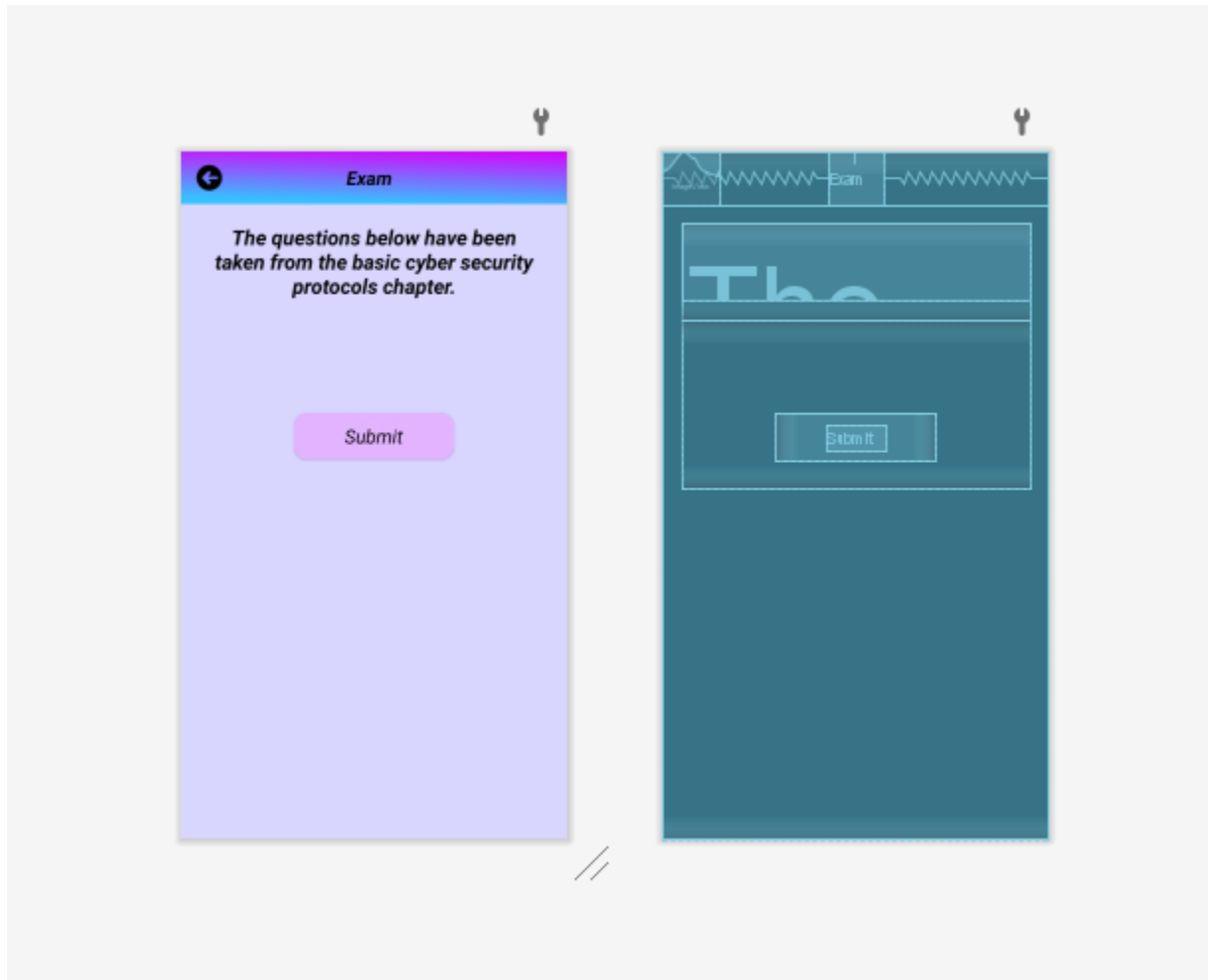
}
<View
    android:layout_width="match_parent"
    android:layout_height="1dp"
    android:background="@color/gray"/>
}
<TextView
    android:id="@+id/go_to_scenario_screen"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:layout_marginBottom="10dp"
    android:text="Scenario"
    android:gravity="center"
    android:padding="10dp"
    android:textSize="20sp"
    android:textColor="@color/black"
    android:textStyle="bold|italic"/>
}
<View
    android:layout_width="match_parent"
    android:layout_height="1dp"
    android:background="@color/gray"/>
}
<TextView
    android:id="@+id/logout_txt"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:layout_marginBottom="10dp"
    android:text="Logout"
    android:gravity="center"
    android:padding="10dp"
    android:textSize="20sp"
    android:textColor="@color/black"
    android:textStyle="bold|italic"/>
}
}
</LinearLayout>
}
</LinearLayout>
}
</LinearLayout>

```

Figure 5.1.6 – XML code of Menu Screen

The XML for the menu screen uses a LinearLayout, ImageView and the ScrollView for list of topics such as Topics, Exams, Statistics etc. The UI palette of the login are warm colours that match the logo and contrast the fields and buttons.

Exam:

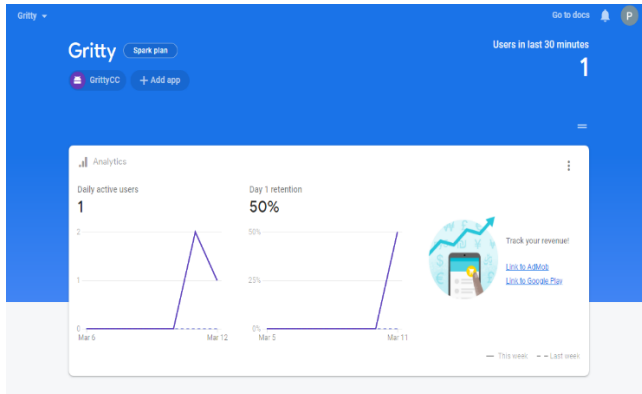


The same theme for the UI is consistent throughout the application and in the application the multiple-choice quiz is created with radio buttons.

6) Database

The firebase is a Backend-as-a Service. Its main purpose is to provide developers with a variety of tools and services to help add quality to their applications and grow their user base. This service is built on Google's infrastructure. Firebase is a NOSQL database program that allows JSON-like documents to be stored as data.

NoSQL does not use tables or records. This type of database was very new to me, but the data is added to a JSON tree and it becomes a node in the structure with an associated key or you can create your own ID or names.



Cloud Firestore

Data Rules Indexes Usage

Prototype and test end-to-end with the Local Emulator Suite, now with Firebase Authentication [Get started](#)

<p>🏠 > Users > hsziiYJW3Wt4lB...</p>		
<p>gritty-36657</p> <p>+ Start collection</p>	<p>📁 Users</p> <p>+ Add document</p>	<p>📄 hsziiYJW3Wt4lBeQJafM</p> <p>+ Start collection</p>
<p>Users ></p>	<p>hsziiYJW3Wt4lBeQJafM ></p> <p>1S3xjBG4G92b4TIidIE9b</p>	<p>+ Add field</p> <p>Email: "patrickamedia@gmail.com"</p> <p>Password: "paddy12345"</p> <p>Username: "PatrickTest"</p>