| **Name of Student:** Ajay Karthikesan | | | |
| --- | --- | --- | --- |
| **Roll Number:** 57 | | **Practical Number:** 1 | |
| **Aim of Practical:**  Study of different android applications using UI components. | | | |
| **DOP:** 29.9.23 | | **DOS:** 26.10.23 | |
| **CO Mapped:** - | **PO Mapped:** - | **Faculty Signature:** | **Marks:** |

## 

## Practical No. 1

**Aim:** Study of different android applications using UI components.

A) Android program using various UI Components.(EditText, RatingBar, CheckBox,

RadioButton, Button etc). Get the values from the components and display them on the next

Activity.

B) Create a login form. For a successful login, display the welcome page, and in case of

failure display an alert box indicating an error message and attempts made. Disable the

submit button after 3 wrong attempts and display the alert message indicating the same.

**Theory:**

layout defines the structure for a user interface in your app, such as in an [activity](https://developer.android.com/guide/components/activities). All elements in the layout are built using a hierarchy of [View](https://developer.android.com/reference/android/view/View) and [ViewGroup](https://developer.android.com/reference/android/view/ViewGroup) objects. A View usually draws something the user can see and interact with. A ViewGroup is an invisible container that defines the layout structure for View and other ViewGroup objects, as shown in figure 1.

**Figure 1.** Illustration of a view hierarchy, which defines a UI layout.

View objects are often called *widgets* and can be one of many subclasses, such as [Button](https://developer.android.com/reference/android/widget/Button) or [TextView](https://developer.android.com/reference/android/widget/TextView). The ViewGroup objects are usually called *layouts* and can be one of many types that provide a different layout structure, such as [LinearLayout](https://developer.android.com/reference/android/widget/LinearLayout) or [ConstraintLayout](https://developer.android.com/reference/androidx/constraintlayout/widget/ConstraintLayout).

You can declare a layout in two ways:

* **Declare UI elements in XML.** Android provides a straightforward XML vocabulary that corresponds to the View classes and subclasses, such as those for widgets and layouts. You can also use Android Studio's [Layout Editor](https://developer.android.com/studio/write/layout-editor) to build your XML layout using a drag-and-drop interface.
* **Instantiate layout elements at runtime.** Your app can create View and ViewGroup objects and manipulate their properties programmatically.

Declaring your UI in XML lets you separate the presentation of your app from the code that controls its behavior. Using XML files also makes it easier to provide different layouts for different screen sizes and orientations. This is discussed further in [Support different screen sizes](https://developer.android.com/training/multiscreen/screensizes).

The Android framework gives you the flexibility to use either or both of these methods to build your app's UI. For example, you can declare your app's default layouts in XML, and then modify the layout at runtime

**Code (A):**

File: MainActivity.java

package vesit.ajayk57.mc.practicala;

import android.content.Intent;

import android.os.Bundle;

import android.widget.Button;

import android.widget.CheckBox;

import android.widget.EditText;

import android.widget.RadioButton;

import android.widget.RatingBar;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

Intent intent=new Intent(this, SummaryActivity.class);

final EditText movieNameEdt=findViewById(R.id.movieNameEdt);

final EditText moveReviewEdt=findViewById(R.id.movieReviewEdt);

final RatingBar ratingBar=findViewById(R.id.ratingBar);

final CheckBox informativeChk=findViewById(R.id.informativeChk);

final CheckBox entertainingChk=findViewById(R.id.entertainmentChk);

final RadioButton rewatchableRb=findViewById(R.id.rewatchableRb);

final Button createBtn=findViewById(R.id.createBtn);

createBtn.setOnClickListener(view -> {

intent.putExtra("name",movieNameEdt.getText().toString());

intent.putExtra("review",moveReviewEdt.getText().toString());

intent.putExtra("rating",ratingBar.getRating());

intent.putExtra("entertaining",entertainingChk.isChecked());

intent.putExtra("informative",informativeChk.isChecked());

intent.putExtra("rewatchable",rewatchableRb.isChecked());

startActivity(intent);

});

}

}

File: SummaryActivity.java

package vesit.ajayk57.mc.practicala;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.widget.Button;

import android.widget.RatingBar;

import android.widget.TextView;

public class SummaryActivity extends AppCompatActivity {

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_summary);

Bundle extras=getIntent().getExtras();

TextView movieNameTxt=findViewById(R.id.movieNameTxt);

TextView movieReviewTxt=findViewById(R.id.movieReviewTxt);

RatingBar ratingBar=findViewById(R.id.ratingBar2);

TextView adjectiveTxt=findViewById(R.id.adjectiveTxt);

TextView rewatchableTxt=findViewById(R.id.rewatchableTxt);

if (extras != null) {

movieNameTxt.setText(extras.getString("name"));

movieReviewTxt.setText(extras.getString("review"));

ratingBar.setRating(extras.getFloat("rating"));

boolean isEntertaining=extras.getBoolean("entertaining");

boolean isInformative=extras.getBoolean("informative");

boolean isRewatchable=extras.getBoolean("rewatchable");

String adjectiveStr=(isInformative?getString(R.string.informative)+" ":"")+

(isEntertaining?getString(R.string.entertaining):"");

adjectiveTxt.setText(adjectiveStr);

String rewatchableStr=getString(R.string.isRewatchable,isRewatchable?"":"not ");

rewatchableTxt.setText(rewatchableStr);

}

Button backButton=findViewById(R.id.backBtn);

backButton.setOnClickListener(view -> finish());

}

}

File: activity\_main.xml

<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout 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"

tools:context=".MainActivity">

<ScrollView

android:layout\_width="match\_parent"

android:layout\_height="match\_parent">

<androidx.constraintlayout.widget.ConstraintLayout

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content">

<TextView

android:id="@+id/textView"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="@string/create\_movie\_review"

android:textAlignment="center"

android:textSize="24sp"

android:textStyle="bold"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.498"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toTopOf="parent"

app:layout\_constraintVertical\_bias="0.0" />

<EditText

android:id="@+id/movieNameEdt"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:autofillHints="movieName"

android:ems="10"

android:hint="@string/movie\_name"

android:inputType="text"

android:textColorHint="@color/design\_default\_color\_secondary\_variant"

android:textSize="24sp"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.497"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/textView"

app:layout\_constraintVertical\_bias="0.0" />

<EditText

android:id="@+id/movieReviewEdt"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:autofillHints="movieReview"

android:ems="10"

android:hint="@string/review"

android:inputType="text|textMultiLine"

android:layerType="none"

android:singleLine="false"

android:textColorHint="@color/design\_default\_color\_secondary\_variant"

android:textSize="24sp"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/movieNameEdt"

app:layout\_constraintVertical\_bias="0.0" />

<RatingBar

android:id="@+id/ratingBar"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.497"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/movieReviewEdt"

app:layout\_constraintVertical\_bias="0.0" />

<LinearLayout

android:id="@+id/linearLayout"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:orientation="vertical"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/ratingBar"

app:layout\_constraintVertical\_bias="0.0">

<CheckBox

android:id="@+id/entertainmentChk"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="16dp"

android:text="@string/entertaining"

android:textSize="20sp" />

<CheckBox

android:id="@+id/informativeChk"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="8dp"

android:text="@string/informative"

android:textSize="20sp" />

</LinearLayout>

<LinearLayout

android:id="@+id/linearLayout2"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:orientation="vertical"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/linearLayout"

app:layout\_constraintVertical\_bias="0.0">

<TextView

android:id="@+id/textView2"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="@string/rewatchable"

android:textSize="20sp"

android:textStyle="bold" />

<RadioGroup

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_gravity="center\_horizontal">

<RadioButton

android:id="@+id/rewatchableRb"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="@string/yes"

android:textSize="20sp" />

<RadioButton

android:id="@+id/notRewatchableRb"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="@string/no"

android:textSize="20sp" />

</RadioGroup>

</LinearLayout>

<Button

android:id="@+id/createBtn"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="@string/create"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/linearLayout2"

app:layout\_constraintVertical\_bias="0.0" />

</androidx.constraintlayout.widget.ConstraintLayout>

</ScrollView>

</androidx.constraintlayout.widget.ConstraintLayout>

File: activity\_summary.xml

<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout 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"

tools:context=".SummaryActivity">

<ScrollView

android:layout\_width="match\_parent"

android:layout\_height="match\_parent">

<androidx.constraintlayout.widget.ConstraintLayout

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content">

<TextView

android:id="@+id/textView3"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="16dp"

android:text="@string/movie\_review"

android:textSize="24sp"

android:textStyle="bold"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toTopOf="parent"

app:layout\_constraintVertical\_bias="0.0" />

<TextView

android:id="@+id/movieNameTxt"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="16dp"

android:textSize="20sp"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/textView3"

app:layout\_constraintVertical\_bias="0.0"

tools:text="Batman" />

<TextView

android:id="@+id/movieReviewTxt"

android:layout\_width="0dp"

android:layout\_height="wrap\_content"

android:layout\_marginStart="16dp"

android:layout\_marginTop="16dp"

android:layout\_marginEnd="16dp"

android:textAlignment="center"

android:textSize="20sp"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/movieNameTxt"

app:layout\_constraintVertical\_bias="0.0"

tools:text="lorem alkjd;lak;lk f;alkdj; alkjda a;ldjf;a a;ldkjf a a;dkljf" />

<RatingBar

android:id="@+id/ratingBar2"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="16dp"

android:clickable="false"

android:contextClickable="false"

android:longClickable="false"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/movieReviewTxt"

app:layout\_constraintVertical\_bias="0.0" />

<TextView

android:id="@+id/adjectiveTxt"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="16dp"

android:textSize="20sp"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/ratingBar2"

app:layout\_constraintVertical\_bias="0.0"

tools:text="Informative-Entertaining" />

<TextView

android:id="@+id/rewatchableTxt"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="16dp"

android:textSize="20sp"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/adjectiveTxt"

app:layout\_constraintVertical\_bias="0.0"

tools:text="Is re-watchable." />

<Button

android:id="@+id/backBtn"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="16dp"

android:text="@string/back"

app:icon="@drawable/back\_arrow"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/rewatchableTxt"

app:layout\_constraintVertical\_bias="0.0" />

</androidx.constraintlayout.widget.ConstraintLayout>

</ScrollView>

</androidx.constraintlayout.widget.ConstraintLayout>

**Code (B):**

File: MainActivity.java

package vesit.ajayk57.mc.practical1b;

import android.content.Intent;

import android.os.Bundle;

import android.widget.Button;

import android.widget.TextView;

import androidx.appcompat.app.AlertDialog;

import androidx.appcompat.app.AppCompatActivity;

import java.util.HashMap;

import java.util.Map;

import java.util.Objects;

public class MainActivity extends AppCompatActivity {

static final Map<String,String> users= new HashMap<String, String>() {{

put("ajay","ajayk57");

put("manoj","m2");

put("george","g1");

}};

static int numOfFailedAttempts=0;

final int MAX\_NUM\_OF\_FAILED\_ATTEMPTS=3;

private static boolean isValidUser(String username,String password){

if(username==null || password==null) return false;

return Objects.equals(users.get(username), password);

}

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

AlertDialog.Builder builder = new AlertDialog.Builder(this);

builder.setTitle(R.string.wrong\_password);

AlertDialog dialog = builder.create();

TextView usernameTxt=findViewById(R.id.usernameTxt);

TextView passwordTxt=findViewById(R.id.passwordTxt);

Button loginBtn=findViewById(R.id.loginBtn);

Intent intent=new Intent(this,WelcomeActivity.class);

loginBtn.setOnClickListener(view -> {

if(isValidUser(usernameTxt.getText().toString(),passwordTxt.getText().toString())){

intent.putExtra("username",usernameTxt.getText().toString());

startActivity(intent);

}

else if(numOfFailedAttempts<MAX\_NUM\_OF\_FAILED\_ATTEMPTS){

++numOfFailedAttempts;

dialog.setMessage(getString(R.string.failed\_attempt\_msg,

MAX\_NUM\_OF\_FAILED\_ATTEMPTS-numOfFailedAttempts));

dialog.show();

}else{

view.setEnabled(false);

}

});

}

}

File: WelcomeActivity.java

package vesit.ajayk57.mc.practical1b;

import android.os.Bundle;

import android.widget.Button;

import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class WelcomeActivity extends AppCompatActivity {

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_welcome);

Bundle extras=getIntent().getExtras();

TextView welcomeTxt=findViewById(R.id.welcomeTxt);

Button backBtn=findViewById(R.id.backBtn);

if (extras != null) {

String welcomeStr = getString(R.string.welcome\_msg,extras.getString("username"));

welcomeTxt.setText(welcomeStr);

}

backBtn.setOnClickListener(view -> finish());

}

}

File: activity\_main.xml

<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout 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"

tools:context=".MainActivity">

<EditText

android:id="@+id/usernameTxt"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:ems="10"

android:hint="@string/username"

android:importantForAutofill="no"

android:inputType="text"

android:textColorHint="@color/design\_default\_color\_secondary\_variant"

android:textSize="20sp"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toTopOf="parent"

app:layout\_constraintVertical\_bias="0.23000002" />

<EditText

android:id="@+id/passwordTxt"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="8dp"

android:ems="10"

android:hint="@string/password"

android:importantForAutofill="no"

android:inputType="textPassword"

android:textColorHint="@color/design\_default\_color\_secondary\_variant"

android:textSize="20sp"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.497"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/usernameTxt"

app:layout\_constraintVertical\_bias="0.0" />

<Button

android:id="@+id/loginBtn"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="8dp"

android:text="@string/login"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/passwordTxt"

app:layout\_constraintVertical\_bias="0.0" />

</androidx.constraintlayout.widget.ConstraintLayout>

File: activity\_welcome.xml

<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout 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"

tools:context=".WelcomeActivity">

<TextView

android:id="@+id/welcomeTxt"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="@string/welcome\_msg"

android:textSize="24sp"

android:textStyle="bold"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toTopOf="parent"

tools:text="Welcome Ajay!" />

<Button

android:id="@+id/backBtn"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="8dp"

android:text="@string/back"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

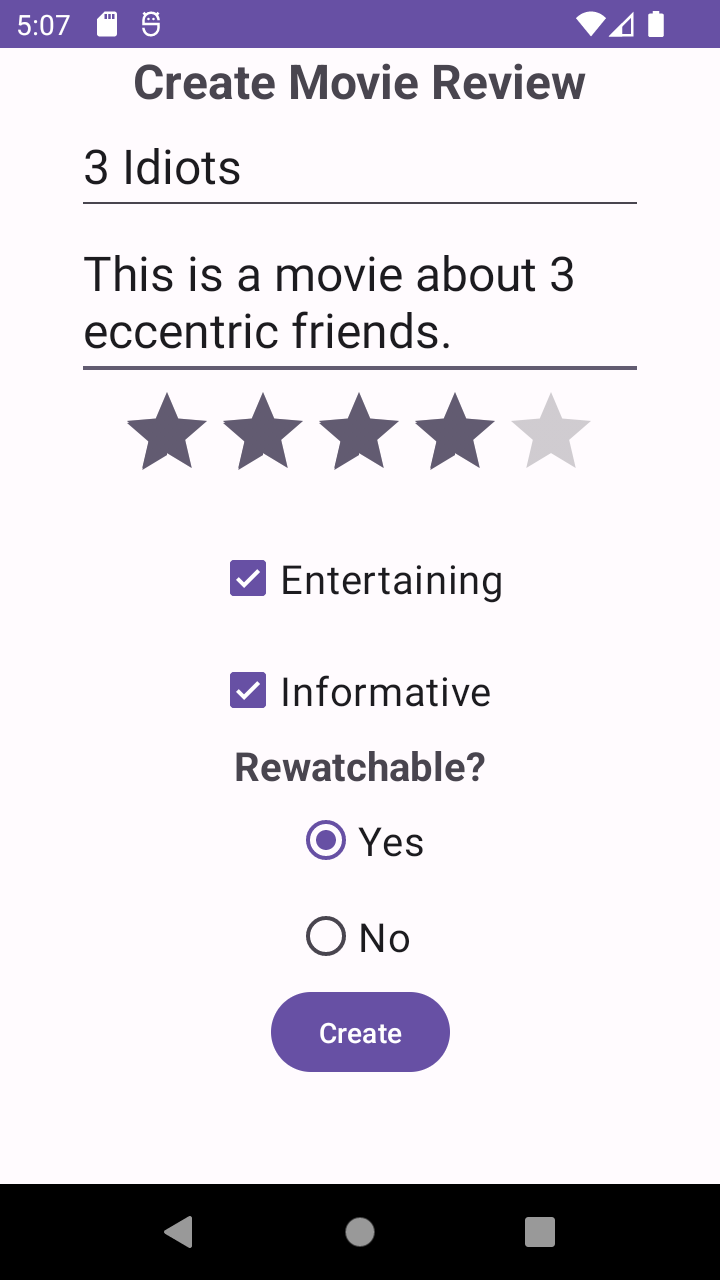
app:layout\_constraintStart\_toStartOf="parent"

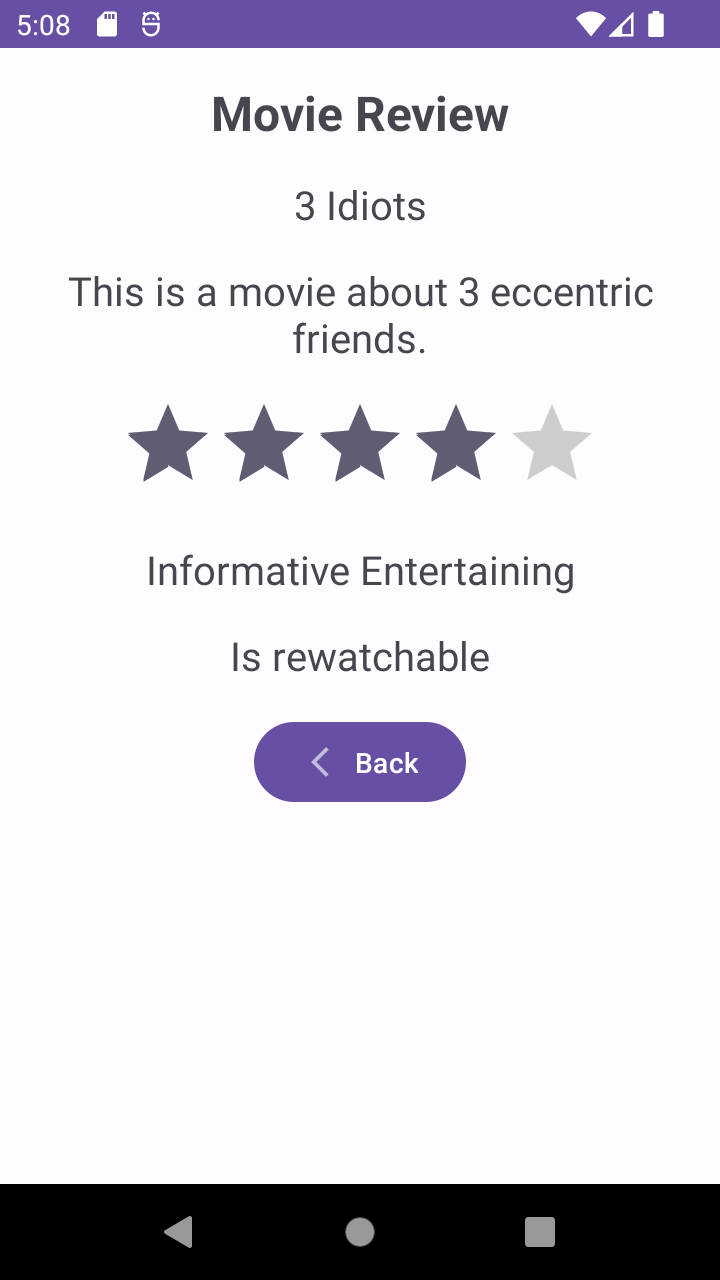
app:layout\_constraintTop\_toBottomOf="@+id/welcomeTxt"

app:layout\_constraintVertical\_bias="0.0" />

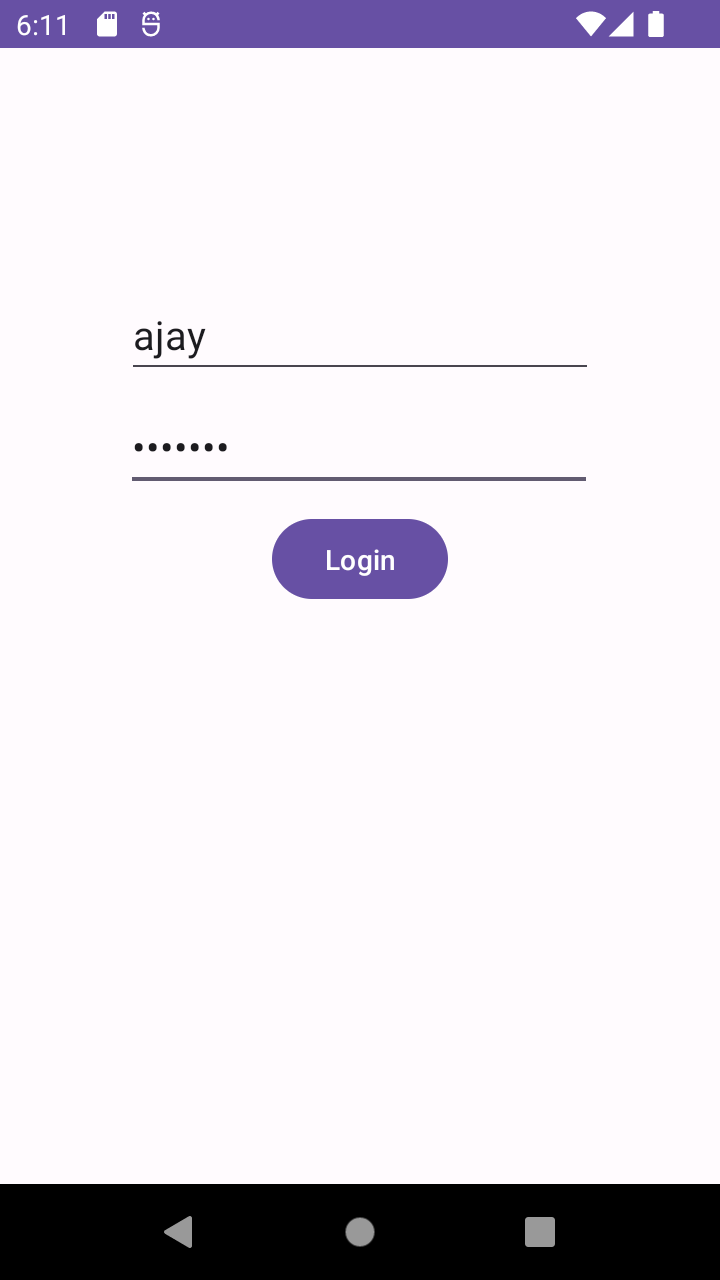
</androidx.constraintlayout.widget.ConstraintLayout>

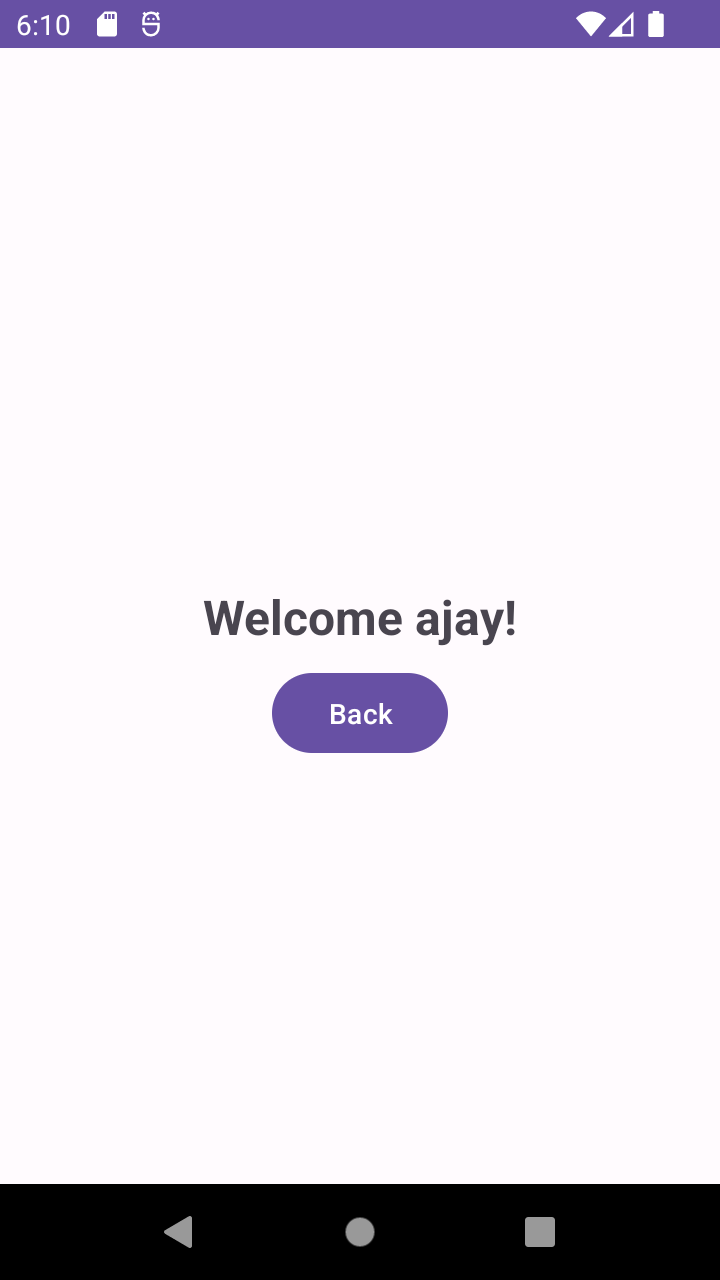
**Output(A):**

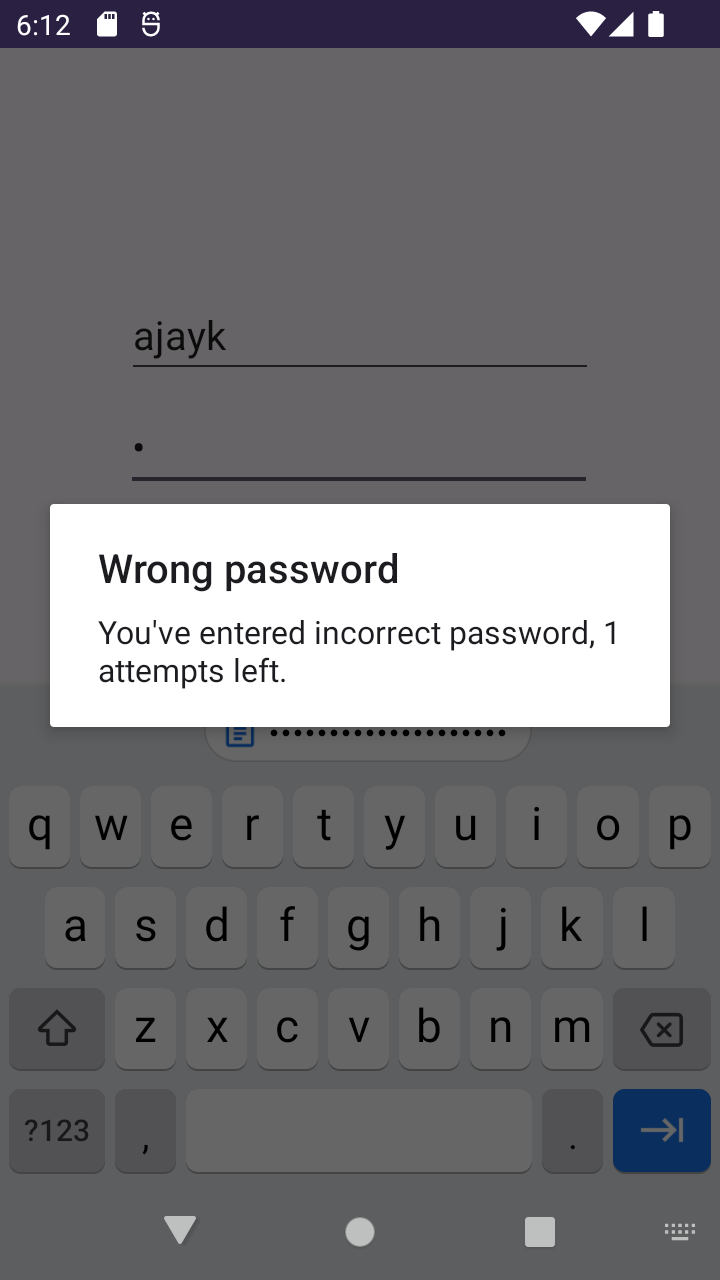


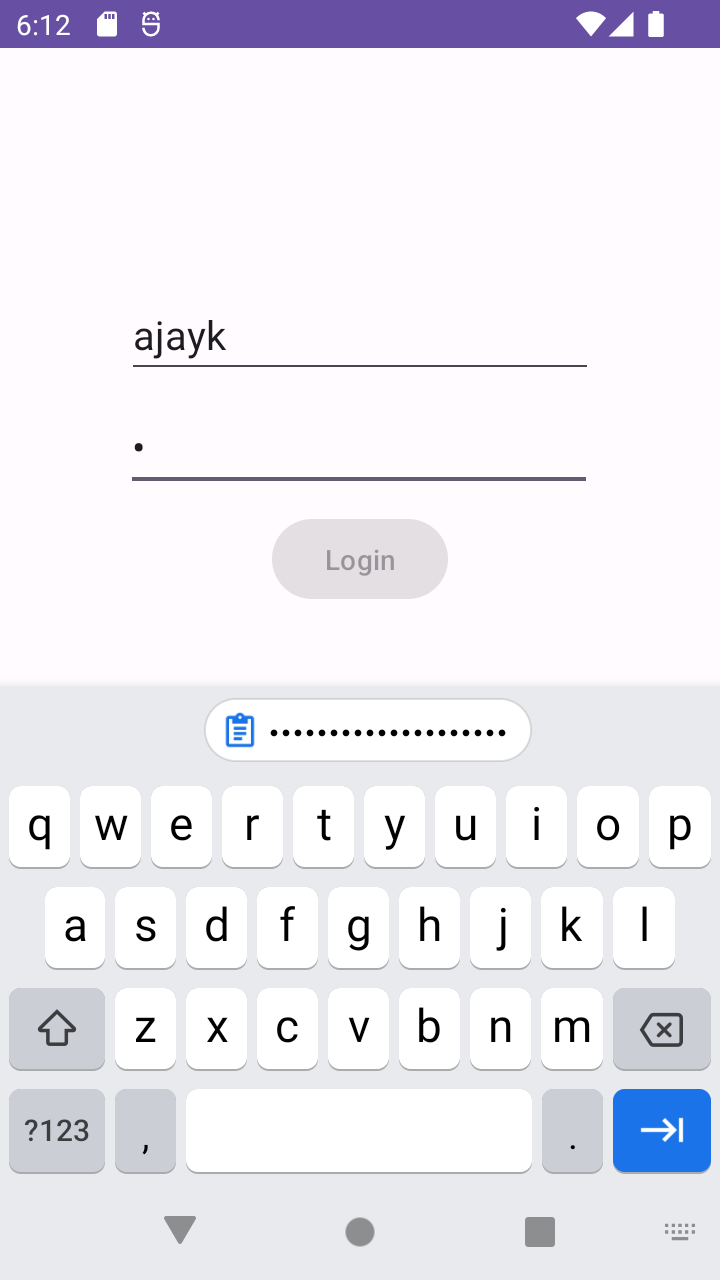


**Output(B):**

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****

****

****

**Conclusion:**

I learnt how to use Android UI components(Views).