1. **Creating Hello World Application**

**Steps:**

**1. Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**4. Update the following code in activity\_main.xml and MainActivity.java**

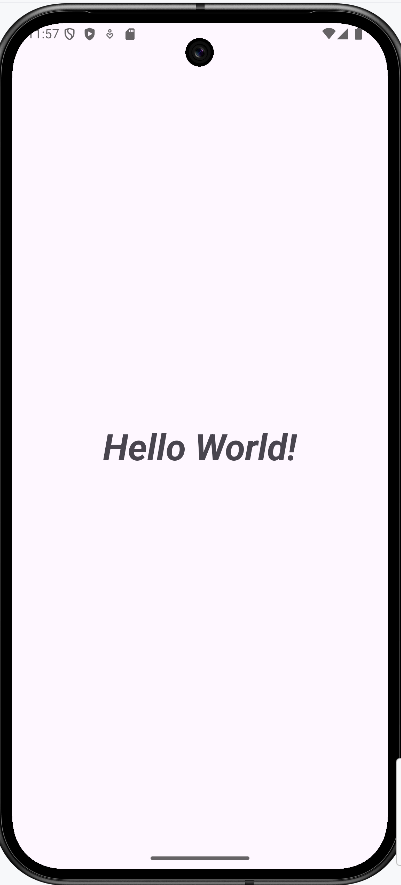
**=>Coding part of Activity\_main.xml**

*<?*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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:text="Hello World!"  
 android:textSize="40sp"  
 android:textStyle="bold|italic"** app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

**=>Coding part of MainActivity.java**

package com.example.loginapplication;  
  
import android.os.Bundle;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
 }  
}

**=>Output of the program**

**

**2. Creating an Application that displays message based on screen orientation**

**Step 1: Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**4. Update the following code in activity\_main.xml and MainActivity.java**

**=>Coding part of 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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:id="@+id/textView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:text="This is Portrait"  
 android:textSize="40sp"**  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.496"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:layout\_constraintVertical\_bias="0.25" />  
  
 <Button  
 android:id="@+id/button"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:onClick="onClick"  
 android:text="Launch new activity"**  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.497"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:layout\_constraintVertical\_bias="0.499" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

**=>Coding part of MainActivity.java**

package com.example.orientation;  
  
**import android.content.Intent;**  
import android.os.Bundle;  
**import android.view.View;**  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
 }  
  
 **public void onClick(View v){  
 Intent intent=new Intent(MainActivity.this,Nextactivity.class);  
 startActivity(intent);  
 }**  
}

**Step 2: Create another new empty views activity and give the name as Nextactivity (Go to app>> New>>Activity>>Empty Views Activity)**

**=>Coding part of Activity\_nextactivity.xml**

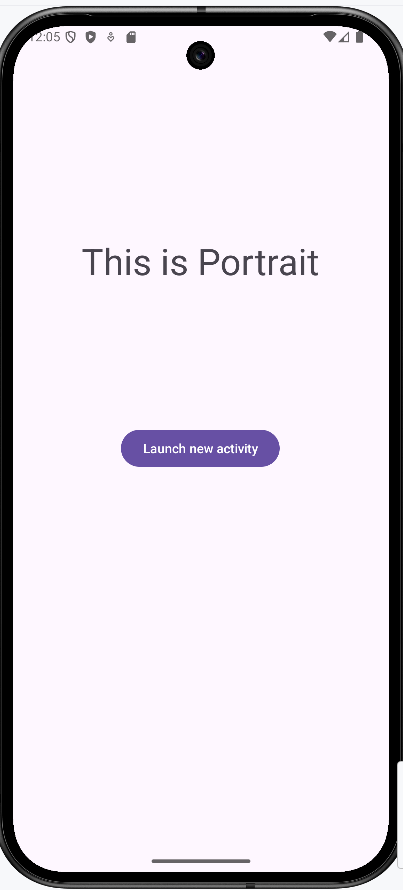
*<?*xml version="1.0" encoding="utf-8"*?>*<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".Nextactivity">  
  
 <TextView  
 android:id="@+id/textView3"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:text="This is Landscape Orientation"  
 android:textSize="30sp"**  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
</androidx.constraintlayout.widget.ConstraintLayout>

**Step 3: Add the screen orientation values in AndroidManifest.xml**

**=>Coding part of AndroidManifest.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<manifest xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:tools="http://schemas.android.com/tools">  
  
 <application  
 android:allowBackup="true"  
 android:dataExtractionRules="@xml/data\_extraction\_rules"  
 android:fullBackupContent="@xml/backup\_rules"  
 android:icon="@mipmap/ic\_launcher"  
 android:label="@string/app\_name"  
 android:roundIcon="@mipmap/ic\_launcher\_round"  
 android:supportsRtl="true"  
 android:theme="@style/Theme.Orientation"  
 tools:targetApi="31">  
 <activity  
 android:name=".Nextactivity"  
 android:exported="false"  
 **android:screenOrientation="landscape"**  
 />  
 <activity  
 android:name=".MainActivity"  
 android:exported="true"  
 **android:screenOrientation="portrait"** >  
 <intent-filter>  
 <action android:name="android.intent.action.MAIN" />  
  
 <category android:name="android.intent.category.LAUNCHER" />  
 </intent-filter>  
 </activity>  
 </application>  
</manifest>

**=>Output of the program**

**

**3. Create and Application to develop Login window using UI controls**

**Step 1: Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**4. Update the following code in activity\_main.xml and MainActivity.java**

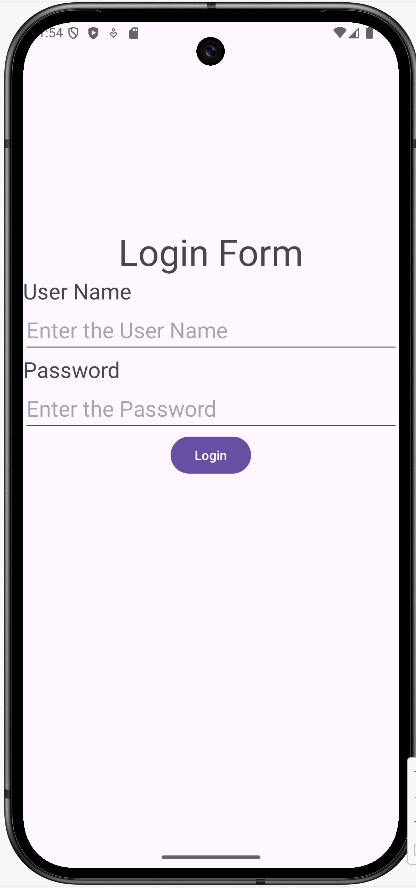
**=>Coding part of Activity\_main.xml**

*<?*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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 **android:orientation="vertical"**  
 tools:context=".MainActivity">  
  
 <TextView  
  **android:id="@+id/tvTitle"**  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:layout\_gravity="center"  
 android:layout\_marginTop="200dp"  
 android:text="Login Form"  
 android:textSize="40sp"** />  
  
 <TextView  
 **android:id="@+id/tvUserName"**  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:text="User Name"  
 android:textSize="24sp"** />  
  
 <EditText  
 **android:id="@+id/etUserName"**  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 **android:hint="Enter the User Name"  
 android:inputType="text"  
 android:textSize="24sp"** />  
  
 <TextView  
 **android:id="@+id/tvPassword"**  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
  **android:text="Password"  
 android:textSize="24sp"** />  
  
 <EditText  
  **android:id="@+id/etPassword"**  
  **android:layout\_width="match\_parent"**  
 android:layout\_height="wrap\_content"  
 **android:hint="Enter the Password"  
 android:inputType="textPassword"  
 android:textSize="24sp"** />  
  
 <Button  
 **android:id="@+id/btnLogin"**  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
  **android:text="Login"  
 android:layout\_gravity="center"** />  
  
</LinearLayout>

**=>Coding part of MainActivity.java**

package com.example.loginapplication;  
  
import android.os.Bundle;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
 }  
}

**=>Output of the program**

****

**4. Create and Application to implement new activity using explicit intent and implicit intent**

**Step 1: Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**4. Update the following code in activity\_main.xml and MainActivity.java**

**=>Coding part of Activity\_main.xml**

*<?*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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 **android:orientation="vertical"**  
 tools:context=".MainActivity">  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:text="Explicit Activity"  
 android:textSize="30sp"  
 android:layout\_gravity="center"  
 android:layout\_marginTop="200dp"**  
 />  
  
 <Button  
 android:id="@+id/btnExplicitContent"  
  **android:layout\_width="match\_parent"**  
 android:layout\_height="wrap\_content"  
 **android:layout\_marginTop="200dp"**  
 **android:onClick="onClick"**  
 **android:text="Explicit Activity"** />  
  
</LinearLayout>

**=>Coding part of MainActivity.java**

package com.example.implicitexplicit;  
**import android.content.Intent;  
import android.view.View;**  
import android.os.Bundle;  
  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
 ViewCompat.*setOnApplyWindowInsetsListener*(findViewById(R.id.*main*), (v, insets) -> {  
 Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.*systemBars*());  
 v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);  
 return insets;  
 });  
 }

**public void onClick(View view) {  
 Intent intent = new Intent(MainActivity.this, NextActivity.class);  
 startActivity(intent);  
 }**  
  
}

**Step 2: Create another new empty views activity and give the name as Nextactivity (Go to app>> New>>Activity>>Empty Views Activity)**

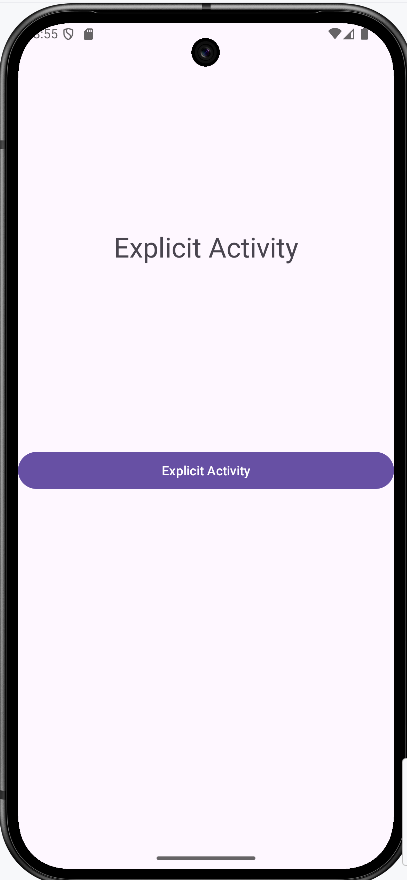
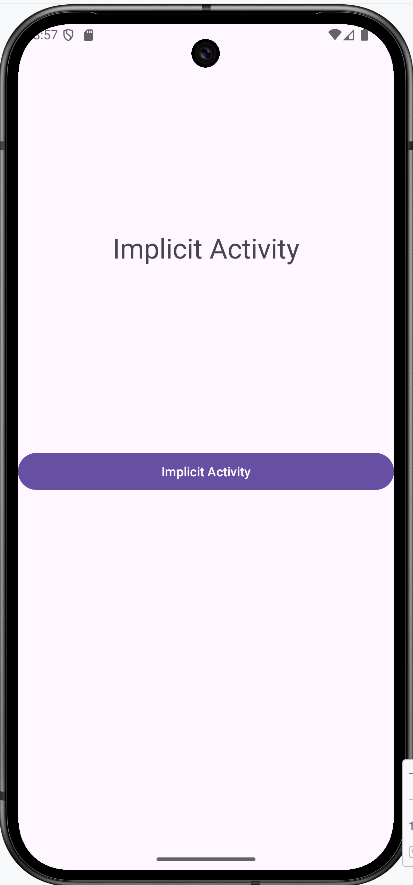
**Coding part of activity\_next.xml**

*<?*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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 **android:orientation="vertical"**  
 tools:context=".NextActivity">  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:text="Implicit Activity"  
 android:textSize="30sp"  
 android:layout\_gravity="center"  
 android:layout\_marginTop="200dp"**  
 />  
  
 <Button  
 android:id="@+id/btnImplicitContent"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 **android:layout\_marginTop="200dp"  
 android:onClick="onClick"  
 android:text="Implicit Activity"** />  
  
</LinearLayout>

**=>Coding part of NextActivity.java**

package com.example.implicitexplicit;  
  
import android.os.Bundle;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
**import android.content.Intent;  
import android.net.Uri;  
import android.view.View;**  
  
public class NextActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_next*);  
 ViewCompat.*setOnApplyWindowInsetsListener*(findViewById(R.id.*main*), (v, insets) -> {  
 Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.*systemBars*());  
 v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);  
 return insets;  
 });  
  
 }  
  
  
 **public void onClick(View view) {  
 Uri webpage= Uri.*parse*("http://www.google.com");  
 Intent intent = new Intent(Intent.*ACTION\_VIEW*, webpage);  
 startActivity(intent);  
 }**  
  
}

**=>Output of the program**

**// 5 Create an application that displays custom designed Opening Screen**

**Project creation Steps:**

**1. Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**Next follow the below steps to create background files**

**Step 1.Create background resources (bg\_inner.xml)**

a. To create resource file, click app>> res >> drawable >> new >>Drawable Resource File

b. Set filename as bg\_inner.xml, root element as shape and then click ok.

**Modify the bg\_inner.xml file.**

**Step 2.Add image to the project**

a. Copy the image file (Ctrl +C) from the file location

b. Click app>>res>> drawable>> right click Paste(Ctrl+V)

**Coding part of bg\_inner.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<shape xmlns:android="http://schemas.android.com/apk/res/android">  
 <gradient  
 android:startColor="#84FFFF"  
 android:endColor="#f08"  
 android:angle="100"/>  
 <corners android:radius="20dp"/>  
</shape>

**Step 3. Change the activity\_main.xml file and MainActivity.java**

**=>Coding part of Activity\_main.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<**RelativeLayout** 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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity"  
 **android:background="@drawable/bg\_inner"**  
 >  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:text="Welcome !!!"  
 android:textSize="40sp"  
 android:layout\_centerInParent="true"**  
 />  
</**RelativeLayout**>

**=>Coding part of MainActivity.java**

package com.example.customdesign;  
  
import android.os.Bundle;  
  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
import android.content.Intent;  
import android.os.Handler;  
  
  
  
public class MainActivity extends AppCompatActivity {

@Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
 ViewCompat.*setOnApplyWindowInsetsListener*(findViewById(R.id.*main*), (v, insets) -> {  
 Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.*systemBars*());  
 v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);  
 return insets;  
 });  
  
  
 **Handler handler=new Handler();  
 handler.postDelayed(new Runnable() {  
 @Override  
 public void run() {  
 Intent intent=new Intent(MainActivity.this,NextActivity.class);  
 startActivity(intent);  
 finish();  
 }  
 },3000);** }  
}

**Step 4. Create one more empty views activity and give the name as NextActivity(Go to app>> New>>Activity>>Empty Views Activity) and change the activity\_next.xml file and *no changes* in the NextActivity.java file**

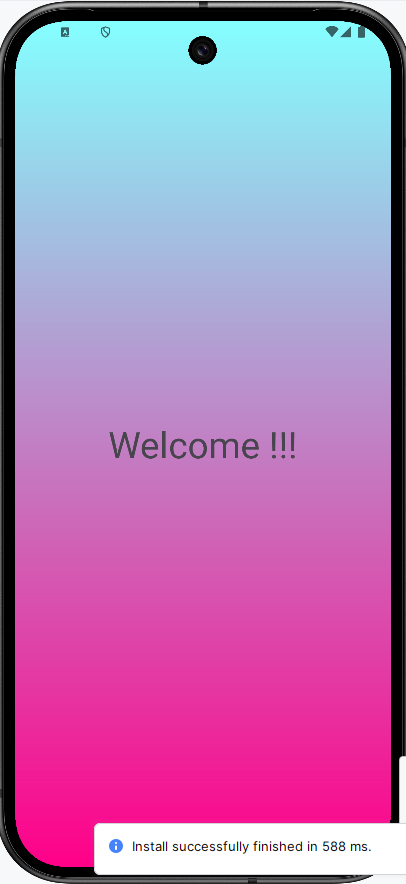
**Coding part of activity\_next.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:app2="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 **tools:context=".NextActivity"  
 android:gravity="center"  
 android:background="@drawable/android"** >  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:text="Welcome to home Page"  
 android:textColor="@color/black"  
 android:textSize="32sp"  
 android:textStyle="bold"  
 android:layout\_centerInParent="true"**  
 />  
</RelativeLayout>

**=>Coding part of NextActivity.java**

package com.example.customdesign;  
  
import android.os.Bundle;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
public class NextActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_next*);  
 ViewCompat.*setOnApplyWindowInsetsListener*(findViewById(R.id.*main*), (v, insets) -> {  
 Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.*systemBars*());  
 v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);  
 return insets;  
 });  
 }  
}

**=>Output of the program**

****

**6. Create and Application to show all views**

**Steps:**

**1. Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**4. Update the following code in activity\_main.xml and MainActivity.java**

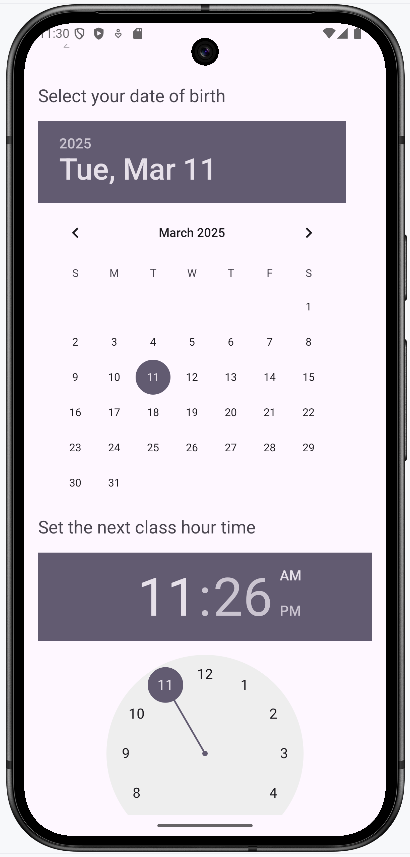
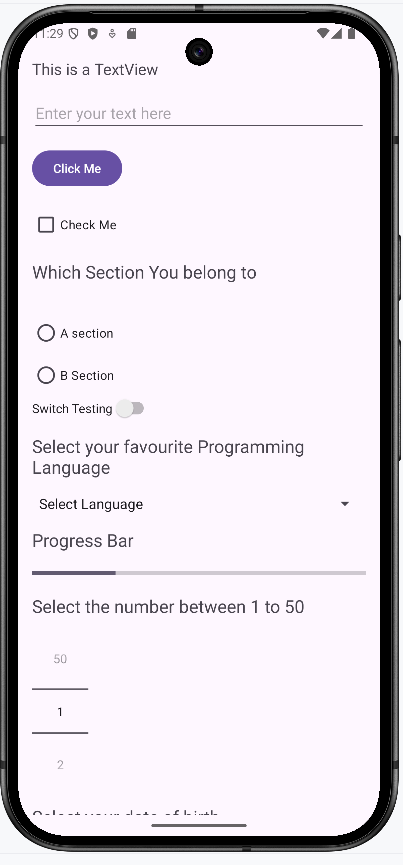
**=>Coding part of Activity\_main.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<ScrollView 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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:orientation="vertical"  
 android:padding="16dp">  
  
 <TextView  
 android:id="@+id/textView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="This is a TextView"  
 android:textSize="18sp"  
 android:layout\_marginBottom="16dp"/>  
  
 <EditText  
 android:id="@+id/editText"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="Enter your text here"  
 android:layout\_marginBottom="16dp" />  
  
 <Button  
 android:id="@+id/button"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Click Me"  
 android:layout\_marginBottom="16dp" />  
  
 <CheckBox  
 android:id="@+id/checkbox"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Check Me"  
 android:layout\_marginBottom="16dp" />  
 <TextView  
 android:id="@+id/textView1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Which Section You belong to"  
 android:textSize="20sp"  
 android:layout\_marginBottom="16dp"/>  
 <RadioGroup  
 android:id="@+id/radioGroup"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:orientation="vertical"  
 android:layout\_marginBottom="16dp" />  
  
 <RadioButton  
 android:id="@+id/radioButton1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="A section" />  
  
 <RadioButton  
 android:id="@+id/radioButton2"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="B Section" />  
  
 <Switch  
 android:id="@+id/switch1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Switch Testing"  
 android:layout\_marginBottom="16dp"/>  
 <TextView  
 android:id="@+id/textView2"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Select your favourite Programming Language"  
 android:textSize="20sp"  
 android:layout\_marginBottom="16dp"/>  
 <Spinner  
 android:id="@+id/spinner"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginBottom="16dp"/>  
 <TextView  
 android:id="@+id/textView3"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Progress Bar"  
 android:textSize="20sp"  
 android:layout\_marginBottom="16dp"/>  
 <ProgressBar  
 android:id="@+id/progressBar"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 style="@style/Widget.AppCompat.ProgressBar.Horizontal"  
 android:progress="25"  
 android:layout\_marginBottom="16dp" />  
 <TextView  
 android:id="@+id/textView4"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Select the number between 1 to 50"  
 android:textSize="20sp"  
 android:layout\_marginBottom="16dp"/>  
 <NumberPicker  
 android:id="@+id/numberPicker1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginBottom="16dp"/>  
 <TextView  
 android:id="@+id/textView5"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Select your date of birth"  
 android:textSize="20sp"  
 android:layout\_marginBottom="16dp"/>  
 <DatePicker  
 android:id="@+id/datePicker"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginBottom="16dp"/>  
 <TextView  
 android:id="@+id/textView6"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Set the next class hour time"  
 android:textSize="20sp"  
 android:layout\_marginBottom="16dp"/>  
 <TimePicker  
 android:id="@+id/timePicker"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginBottom="16dp"/>  
  
 </LinearLayout>  
  
</ScrollView>

**=>Coding part of MainActivity.java**

package com.example.mainactivity;  
  
import android.os.Bundle;  
import android.widget.ArrayAdapter;  
import android.widget.Spinner;  
  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
import java.util.ArrayList;  
import android.widget.NumberPicker;  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
 ViewCompat.*setOnApplyWindowInsetsListener*(findViewById(R.id.*main*), (v, insets) -> {  
 Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.*systemBars*());  
 v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);  
 return insets;  
 });  
 **Spinner spinner = findViewById(R.id.*spinner*);  
 ArrayList<String> arrayList = new ArrayList<>();  
 arrayList.add("Select Language");  
 arrayList.add("JAVA");  
 arrayList.add("ANDROID");  
 arrayList.add("C Language");  
 arrayList.add("CPP Language");  
 arrayList.add("Python Programming");  
  
 ArrayAdapter<String> arrayAdapter = new ArrayAdapter<String>(this,  
 android.R.layout.*simple\_spinner\_item*, arrayList);  
 arrayAdapter.setDropDownViewResource(android.R.layout.*simple\_spinner\_dropdown\_item*);  
 spinner.setAdapter(arrayAdapter);  
  
  
 NumberPicker numberPicker1 = findViewById(R.id.*numberPicker1*);  
 numberPicker1.setMinValue(1);  
 numberPicker1.setMaxValue(50);**  
 }  
}

**=> Output of the program**



**7 Create a menu in application**

**Steps:**

**1. Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**Steps to be followed to create the menu**

**Step1. Create Android resource directory by clicking res>>new>>Android Resource directory, give the name as menu**

**Step2. Right click menu folder click new>> Menu Resource File, give the name of the file as menus.**

**Add the following code in menus.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<menu xmlns:android="http://schemas.android.com/apk/res/android">  
 <item android:id="@+id/php" android:title="PHP"/>  
 <item android:id="@+id/java" android:title="JAVA"/>  
 <item android:id="@+id/csharp" android:title="C#"/>  
</menu>

**Step 3. =>Coding part of Activity\_main.xml ( Remove Helloworld textview control)**

*<?*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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
</androidx.constraintlayout.widget.ConstraintLayout>

**Step 4. =>Coding part of MainActivity.java**

package com.example.menuapp;  
  
import android.os.Bundle;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
**import android.view.Menu;  
import android.view.MenuInflater;  
import android.view.MenuItem;  
import android.widget.Toast;**  
  
  
public class MainActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
 }

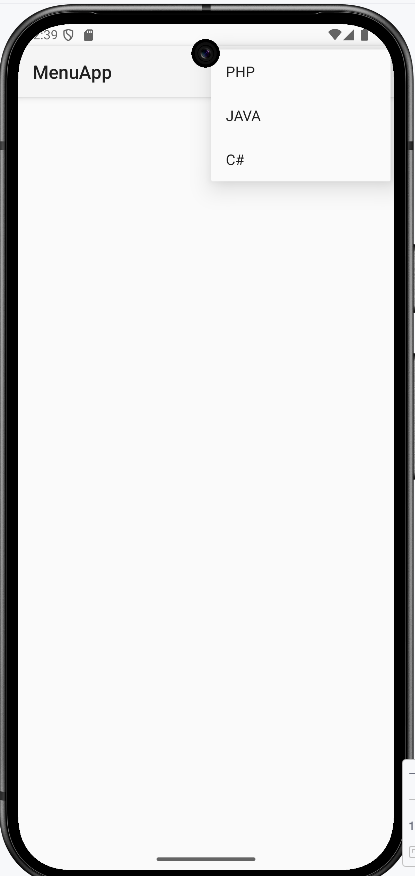
@Override

**public boolean onCreatePanelMenu(int featureId,Menu menu)  
 {  
 MenuInflater inflater=getMenuInflater();   
 inflater.inflate(R.menu.*menus*,menu);  
 return true;  
 }  
 @Override  
 public boolean onOptionsItemSelected(MenuItem item)  
 {  
 if(item.getItemId()==R.id.*php*) {  
 Toast.*makeText*(this, "Php Page", Toast.*LENGTH\_SHORT*).show();  
 }  
 if(item.getItemId()==R.id.*java*) {  
 Toast.*makeText*(this, "Java Page", Toast.*LENGTH\_SHORT*).show();  
 }  
 if(item.getItemId()==R.id.*csharp*) {  
 Toast.*makeText*(this, "C# Page", Toast.*LENGTH\_SHORT*).show();  
 }  
 return true;  
 }**  
 }

**Step 5. Change the theme value AndroidManifest.xml file**

*<?*xml version="1.0" encoding="utf-8"*?>*<manifest xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:tools="http://schemas.android.com/tools">  
 <application  
 android:allowBackup="true"  
 android:dataExtractionRules="@xml/data\_extraction\_rules"  
 android:fullBackupContent="@xml/backup\_rules"  
 android:icon="@mipmap/ic\_launcher"  
 android:label="@string/app\_name"  
 android:roundIcon="@mipmap/ic\_launcher\_round"  
 android:supportsRtl="true"  
 **android:theme="@style/Theme.AppCompat.Light"**  
 tools:targetApi="31">  
 <activity  
 android:name=".MainActivity"  
 android:exported="true">  
 <intent-filter>  
 <action android:name="android.intent.action.MAIN" />  
  
 <category android:name="android.intent.category.LAUNCHER"/>  
 </intent-filter>  
 </activity>  
 </application>  
</manifest>

**=>Output of the program**

****

**8. Create an application to read/ write the Local data.**

**Steps:**

**1. Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**4. Update the following code in activity\_main.xml and MainActivity.java**

**=>Coding part of Activity\_main.xml**

*<?*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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:id="@+id/tvTitle"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center"  
 android:layout\_marginTop="200dp"  
 android:text="Login Form"  
 android:textSize="40sp" />  
  
 <TextView  
 android:id="@+id/tvUserName"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="User Name"  
 android:textSize="24sp" />  
  
 <EditText  
 android:id="@+id/etUserName"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="Enter the User Name"  
 android:inputType="text"  
 android:textSize="24sp" />  
  
 <TextView  
 android:id="@+id/tvPassword"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Password"  
 android:textSize="24sp" />  
  
 <EditText  
 android:id="@+id/etPassword"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="Enter the Password"  
 android:inputType="textPassword"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/btnSave"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center"  
 android:onClick="onSaveClick"  
 android:text="Save" />  
 <Button  
 android:id="@+id/btnNext"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center"  
 android:onClick="onNextClick"  
 android:text="Next" />  
  
</LinearLayout>

**=>Coding part of MainActivity.java**

package com.example.savelocaldata;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
**import android.content.Context;  
import android.content.Intent;  
import android.content.SharedPreferences;**  
import android.os.Bundle;  
**import android.view.View;  
import android.widget.EditText;  
import android.widget.Toast;**  
  
public class MainActivity extends AppCompatActivity {  
 **EditText etUserName,etPassword;**  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
  
 **etUserName = findViewById(R.id.*etUserName*);  
 etPassword = findViewById(R.id.*etPassword*);** }  
  
 **public void onSaveClick(View view) {  
  
 SharedPreferences sharedPreferences = getSharedPreferences("MyPrefs", Context.*MODE\_PRIVATE*);  
 SharedPreferences.Editor editor = sharedPreferences.edit();  
 editor.putString("username",etUserName.getText().toString());  
 editor.putString("password", etPassword.getText().toString());  
 editor.apply();  
 Toast.*makeText*(getApplicationContext(),"Saved successfully",Toast.*LENGTH\_LONG*).show();  
 }  
  
 public void onNextClick(View view) {  
 Intent intent = new Intent(this, NextActivity.class);  
 startActivity(intent);  
 }**

}

**Next Step. Create one more empty views activity and give the name as NextActivity (Go to app>> New>>Activity>>Empty Views Activity)**

**Coding part of activity\_next.xml**

*<?*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:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:id="@+id/tvTitle"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center"  
 android:layout\_marginTop="200dp"  
 android:text="Your Details"  
 android:textSize="40sp" />  
  
 <TextView  
 android:id="@+id/tvUserName"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="User Name"  
 android:textSize="24sp" />  
  
 <EditText  
 android:id="@+id/etUserName"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="Enter the User Name"  
 android:inputType="text"  
 android:textSize="24sp" />  
  
 <TextView  
 android:id="@+id/tvPassword"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Password"  
 android:textSize="24sp" />  
  
 <EditText  
 android:id="@+id/etPassword"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:hint="Enter the Password"  
 android:inputType="text"  
 android:textSize="24sp" />  
  
</LinearLayout>

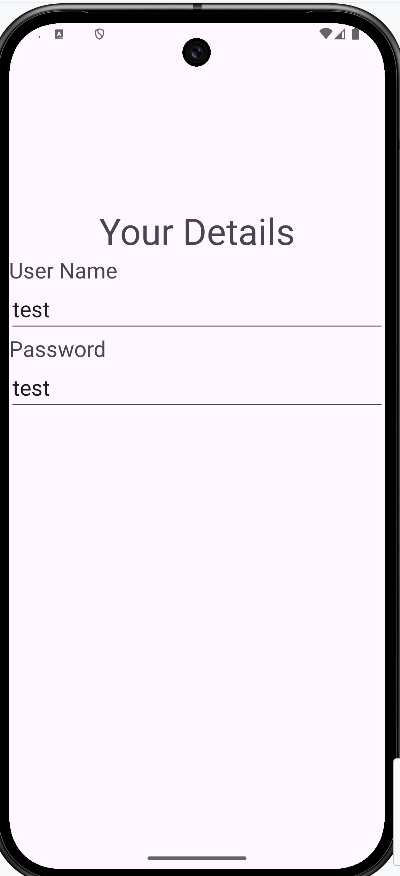
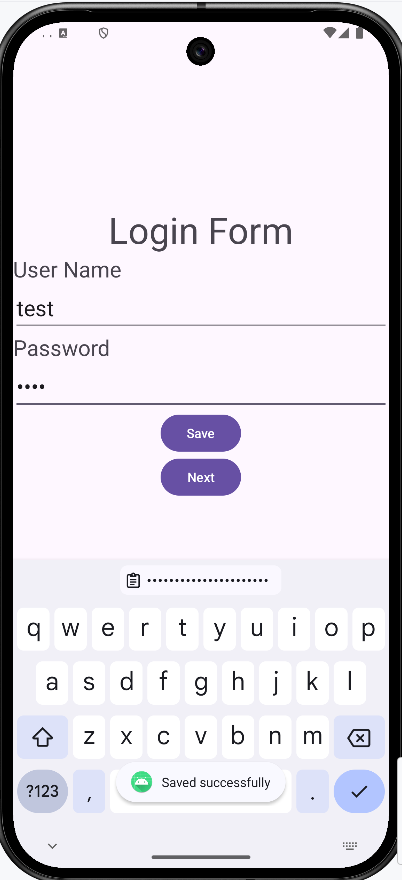
**=>Coding part of NextActivity.java**

package com.example.savelocaldata;  
  
import android.os.Bundle;  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
import android.content.Context;  
import android.content.SharedPreferences;  
import android.widget.EditText;  
  
public class NextActivity extends AppCompatActivity {  
 EditText etUserName,etPassword;  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_next*);

**etUserName = findViewById(R.id.*etUserName*);  
etPassword = findViewById(R.id.*etPassword*);  
  
SharedPreferences sharedPreferences = getSharedPreferences("MyPrefs", Context.*MODE\_PRIVATE*);  
String username = sharedPreferences.getString("username", "");  
String password = sharedPreferences.getString("password", "");  
etUserName.setText(username);  
etPassword.setText(password);**

}  
}

**=>Output of the program**



**//9 Create / Read / Write data with database (SQLite)**

**Steps:**

**1. Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**4. Update the following code in activity\_main.xml and MainActivity.java**

**=>Coding part of Activity\_main.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<AbsoluteLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="50dp"  
 android:layout\_y="20dp"  
 android:text="Student Details"  
 android:textSize="30sp" />  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="20dp"  
 android:layout\_y="110dp"  
 android:text="Enter Rollno:"  
 android:textSize="20sp" />  
  
 <EditText  
 android:id="@+id/Rollno"  
 android:layout\_width="150dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="175dp"  
 android:layout\_y="100dp"  
 android:inputType="number"  
 android:textSize="20sp" />  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="20dp"  
 android:layout\_y="160dp"  
 android:text="Enter Name:"  
 android:textSize="20sp" />  
  
 <EditText  
 android:id="@+id/Name"  
 android:layout\_width="150dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="175dp"  
 android:layout\_y="150dp"  
 android:inputType="text"  
 android:textSize="20sp" />  
  
 <TextView  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="20dp"  
 android:layout\_y="210dp"  
 android:text="Enter Marks:"  
 android:textSize="20sp" />  
  
 <EditText  
 android:id="@+id/Marks"  
 android:layout\_width="150dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="175dp"  
 android:layout\_y="200dp"  
 android:inputType="number"  
 android:textSize="20sp" />  
  
 <Button  
 android:id="@+id/Insert"  
 android:layout\_width="150dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="25dp"  
 android:layout\_y="300dp"  
 android:onClick="onClickInsert"  
 android:text="Insert"  
 android:textSize="30dp" />  
  
 <Button  
 android:id="@+id/Delete"  
 android:layout\_width="150dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="200dp"  
 android:layout\_y="300dp"  
 android:onClick="onClickDelete"  
 android:text="Delete"  
 android:textSize="30dp" />  
  
 <Button  
 android:id="@+id/Update"  
 android:layout\_width="150dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="25dp"  
 android:layout\_y="400dp"  
 android:onClick="onClickUpdate"  
 android:text="Update"  
 android:textSize="30dp" />  
  
 <Button  
 android:id="@+id/View"  
 android:layout\_width="150dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="200dp"  
 android:layout\_y="400dp"  
 android:onClick="onClickView"  
 android:text="View"  
 android:textSize="30dp" />  
  
 <Button  
 android:id="@+id/ViewAll"  
 android:layout\_width="200dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_x="100dp"  
 android:layout\_y="500dp"  
 android:onClick="onClickViewAll"  
 android:text="View All"  
 android:textSize="30dp" />  
  
</AbsoluteLayout>

**=>Coding part of MainActivity.java**

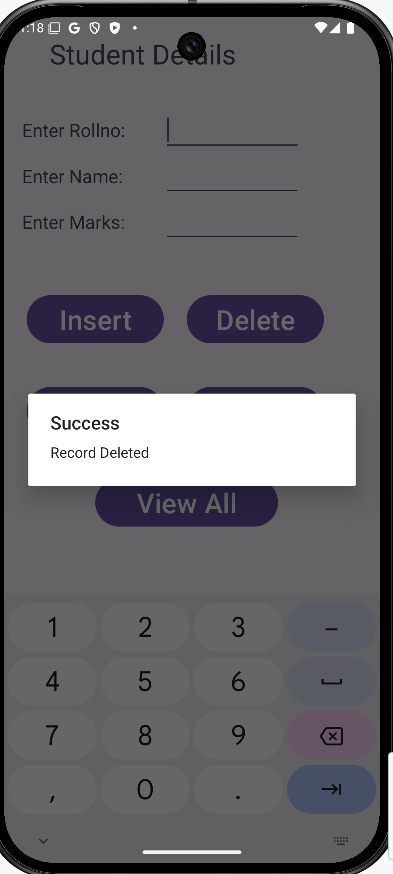
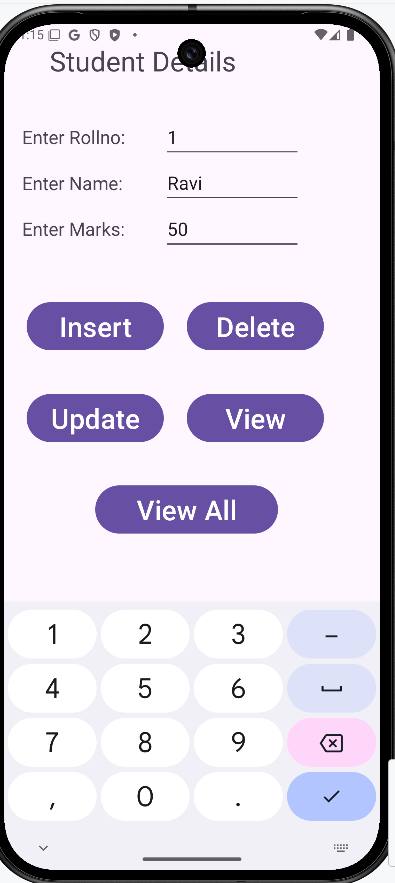
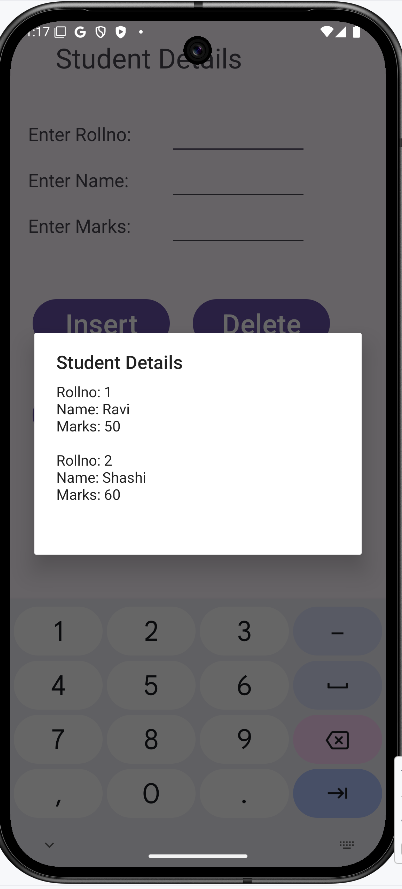
package com.example.databaseapp;  
  
**import android.app.AlertDialog;  
import android.content.Context;  
import android.database.Cursor;  
import android.database.sqlite.SQLiteDatabase;**import android.os.Bundle;  
**import android.widget.Button;  
import android.widget.EditText;**  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
**import android.view.View;**  
  
  
public class MainActivity extends AppCompatActivity {

**EditText Rollno,Name,Marks;  
 SQLiteDatabase db;**

@Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
  
 **Rollno=findViewById(R.id.*Rollno*);  
 Name=findViewById(R.id.*Name*);  
 Marks=findViewById(R.id.*Marks*);  
  
 db=openOrCreateDatabase("StudentDB", Context.*MODE\_PRIVATE*, null);  
 db.execSQL("CREATE TABLE IF NOT EXISTS student(rollno VARCHAR,name VARCHAR,marks INT);");**

}  
 **public void onClickInsert(View view) {  
 if (Rollno.getText().toString().trim().length() == 0 ||  
 Name.getText().toString().trim().length() == 0 ||  
 Marks.getText().toString().trim().length() == 0) {  
 showMessage("Error", "Please enter all values");  
 return;  
 }  
 db.execSQL("INSERT INTO student VALUES('" + Rollno.getText() + "','" + Name.getText() +  
 "','" + Marks.getText() + "');");  
  
 showMessage("Success", "Record added");  
 clearText();  
  
 }  
  
 public void onClickDelete(View view) {  
  
 if(Rollno.getText().toString().trim().length()==0)  
 {  
 showMessage("Error", "Please enter Rollno");  
 return;  
 }  
 Cursor c=db.rawQuery("SELECT \* FROM student WHERE rollno='"+Rollno.getText()+"'", null);  
 if(c.moveToFirst())  
 {  
 db.execSQL("DELETE FROM student WHERE rollno='"+Rollno.getText()+"'");  
 showMessage("Success", "Record Deleted");  
 }  
 else  
 {  
 showMessage("Error", "Invalid Rollno");  
 }  
 clearText();  
 }  
  
 public void onClickUpdate(View view){  
  
 if(Rollno.getText().toString().trim().length()==0)  
 {  
 showMessage("Error", "Please enter Rollno");  
 return;  
 }  
 Cursor c=db.rawQuery("SELECT \* FROM student WHERE rollno='"+Rollno.getText()+"'", null);  
 if(c.moveToFirst()) {  
 db.execSQL("UPDATE student SET name='" + Name.getText() + "',marks='" + Marks.getText() +  
 "' WHERE rollno='"+Rollno.getText()+"'");  
 showMessage("Success", "Record Modified");  
 }  
 else {  
 showMessage("Error", "Invalid Rollno");  
 }  
 clearText();  
 }  
  
 public void onClickView(View view) {  
  
 if(Rollno.getText().toString().trim().length()==0)  
 {  
 showMessage("Error", "Please enter Rollno");  
 return;  
 }  
 Cursor c=db.rawQuery("SELECT \* FROM student WHERE rollno='"+Rollno.getText()+"'", null);  
 if(c.moveToFirst())  
 {  
 Name.setText(c.getString(1));  
 Marks.setText(c.getString(2));  
 }  
 else  
 {  
 showMessage("Error", "Invalid Rollno");  
 clearText();  
 }  
 }  
  
 public void onClickViewAll(View view) {  
 Cursor c=db.rawQuery("SELECT \* FROM student", null);  
 if(c.getCount()==0)  
 {  
 showMessage("Error", "No records found");  
 return;  
 }  
 StringBuffer buffer=new StringBuffer();  
 while(c.moveToNext())  
 {  
 buffer.append("Rollno: "+c.getString(0)+"\n");  
 buffer.append("Name: "+c.getString(1)+"\n");  
 buffer.append("Marks: "+c.getString(2)+"\n\n");  
 }  
 showMessage("Student Details", buffer.toString());  
 }  
 public void showMessage(String title,String message)  
 {  
 AlertDialog.Builder builder=new AlertDialog.Builder(this);  
 builder.setCancelable(true);  
 builder.setTitle(title);  
 builder.setMessage(message);  
 builder.show();  
 }  
 public void clearText()  
 {  
 Rollno.setText("");  
 Name.setText("");  
 Marks.setText("");  
 Rollno.requestFocus();  
 }  
}**

**=>Output of the program**

**10. Create an application to send SMS**

**Steps:**

**1. Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**4. Update the following code in activity\_main.xml and MainActivity.java**

**=>Coding part of Activity\_main.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:gravity="center\_horizontal"  
 android:orientation="vertical">  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="16dp"  
 android:layout\_marginTop="32dp"  
 android:layout\_marginEnd="16dp"  
 android:orientation="horizontal">

<TextView  
 android:id="@+id/textView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Phone Number:"  
 android:width="165sp"  
 android:textSize="18sp" />  
  
 <EditText  
 android:id="@+id/etPhoneNumber"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:ems="10"  
 android:hint="Enter number"  
 android:inputType="phone" />  
 </LinearLayout>  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="16dp"  
 android:layout\_marginTop="32dp"  
 android:layout\_marginEnd="16dp"  
 android:orientation="horizontal">  
  
 <TextView  
 android:id="@+id/textView2"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Message to be Sent:"  
 android:width="165sp"  
 android:textSize="18sp" />  
  
 <EditText  
 android:id="@+id/etMessage"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:hint="Enter message"  
 android:inputType="textMultiLine" />

</LinearLayout>  
  
 <Button  
 android:id="@+id/btnSendSMS"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_gravity="center\_horizontal"  
 android:layout\_marginTop="32dp"  
 android:onClick="onClick"  
 android:text="SEND SMS" />

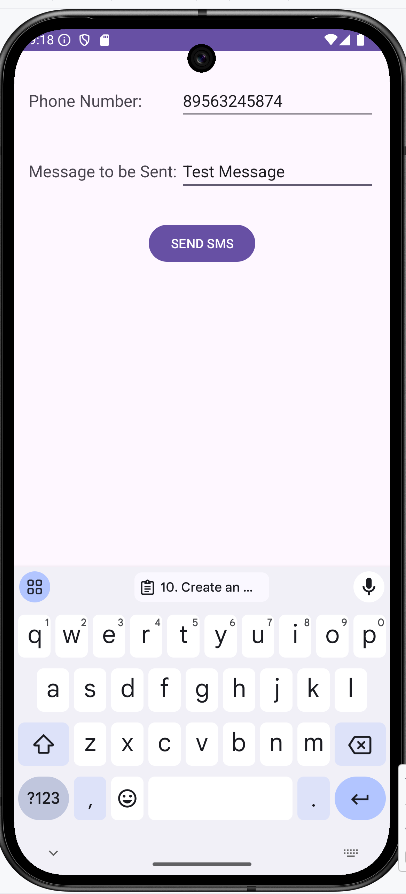
</LinearLayout>

**=>Coding part of MainActivity.java**

package com.example.sendsms;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.app.ActivityCompat;  
import androidx.core.content.ContextCompat;  
import android.content.pm.PackageManager;  
import android.os.Bundle;  
**import android.telephony.SmsManager;  
import android.view.View;  
import android.widget.EditText;  
import android.widget.Toast;**import android.Manifest;  
  
public class MainActivity extends AppCompatActivity {

**private static final int *SMS\_PERMISSION\_CODE* = 101;  
 EditText etPhoneNumber, etMessage;** @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 **etPhoneNumber = findViewById(R.id.*etPhoneNumber*);  
 etMessage = findViewById(R.id.*etMessage*);  
  
 if (!checkSMSPermission()) {  
 requestSMSPermission();  
 }** }  
 **private boolean checkSMSPermission() {  
 return ContextCompat.*checkSelfPermission*(this,  
 Manifest.permission.*SEND\_SMS*) == PackageManager.*PERMISSION\_GRANTED*;  
 }  
  
private void requestSMSPermission() {  
 ActivityCompat.*requestPermissions*(this, new  
 String[]{Manifest.permission.*SEND\_SMS*}, *SMS\_PERMISSION\_CODE*);  
 }  
 public void onClick(View view) {  
 String strPhoneNumber = etPhoneNumber.getText().toString();  
 String strMessage = etMessage.getText().toString();  
 try {  
 SmsManager smsManager = SmsManager.*getDefault*();  
 smsManager.sendTextMessage(strPhoneNumber,null,strMessage,null, null);  
 Toast.*makeText*(getApplicationContext(), "Message Sent", Toast.*LENGTH\_LONG*).show();  
 } catch (Exception e) {  
 Toast.*makeText*(getApplicationContext(), e.toString(), Toast.*LENGTH\_LONG*).show();  
 }  
 }**}

**=>Output of the program**



**11. Create an application to send Email**

**Steps:**

**1. Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

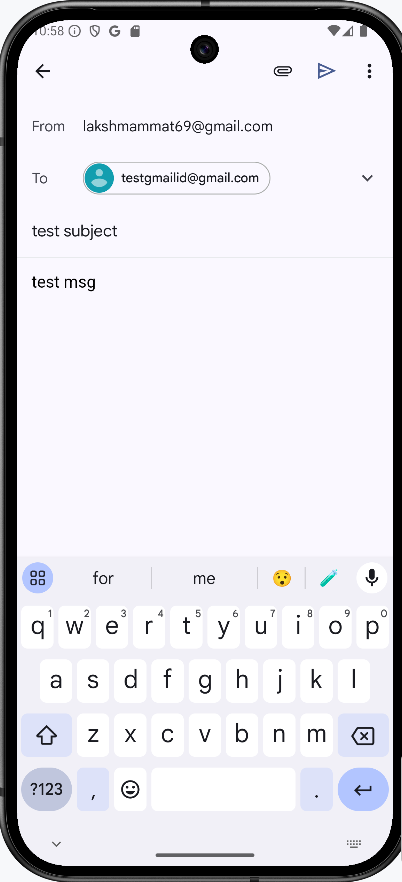
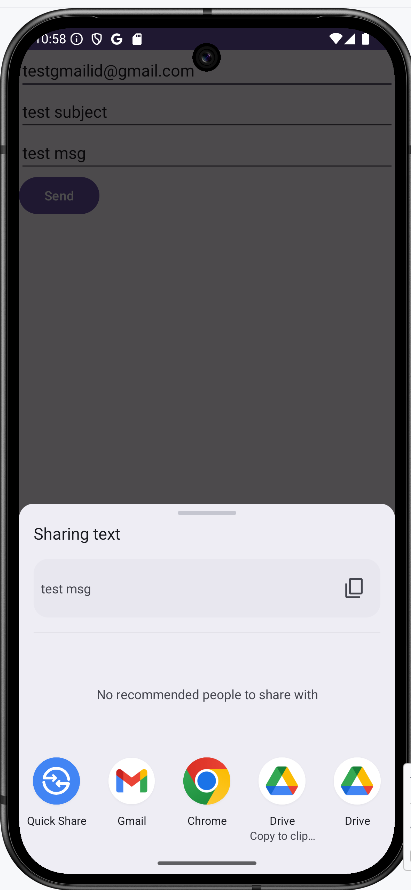
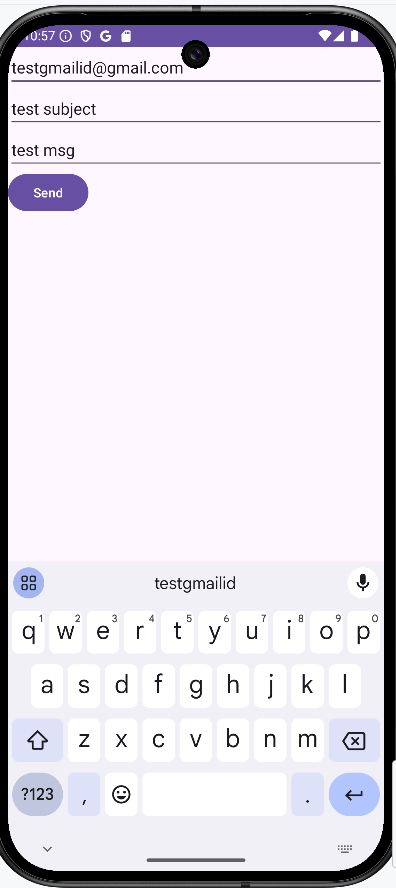
**4. Update the following code in activity\_main.xml and MainActivity.java**

**=>Coding part of Activity\_main.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 **android:orientation="vertical"**  
 tools:context=".MainActivity">  
 <EditText  
 **android:id="@+id/etTo"**  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 **android:hint="To"/>**  
 <EditText  
 **android:id="@+id/etSubject"**  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 **android:layout\_below="@id/etTo"  
 android:hint="Subject"/>**  
 <EditText  
 **android:id="@+id/etMessage"**  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 **android:layout\_below="@id/etSubject"  
 android:hint="Message"/>**  
 <Button  
 **android:id="@+id/btnSend"**  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:onClick="onClick"  
 android:layout\_below="@id/etMessage"  
 android:text="Send"/>**  
</LinearLayout>

**=>Coding part of MainActivity.java**

import androidx.appcompat.app.AppCompatActivity;  
import android.content.Intent;  
import android.os.Bundle;  
import android.view.View;  
import android.widget.EditText;  
public class MainActivity extends AppCompatActivity {  
 **EditText etTo, etSubject, etMessage;**  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState)  
 {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 **etTo = findViewById(R.id.*etTo*);  
 etSubject = findViewById(R.id.*etSubject*);  
 etMessage = findViewById(R.id.*etMessage*);** }  
 **public void onClick(View v){  
 String strTo = etTo.getText().toString().trim();  
 String strSubject = etSubject.getText().toString().trim();  
 String strMessage = etMessage.getText().toString().trim();  
 Intent intent = new Intent(Intent.*ACTION\_SEND*);  
 intent.setType("text/plain");  
 intent.putExtra(Intent.*EXTRA\_EMAIL*, new String[]{strTo});  
 intent.putExtra(Intent.*EXTRA\_SUBJECT*, strSubject);  
 intent.putExtra(Intent.*EXTRA\_TEXT*, strMessage);  
 if (intent.resolveActivity(getPackageManager()) != null)  
 {  
 startActivity(Intent.*createChooser*(intent, "Choose an email client"));  
 }  
 }**}



**12. Create an Application to Display Map based on the Current/given location**

**Steps:**

**1. Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**4. Update the following code in activity\_main.xml and MainActivity.java**

**=>Coding part of Activity\_main.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
 <fragment  
 android:id="@+id/map"  
 android:name="com.google.android.gms.maps.SupportMapFragment"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:layout\_alignParentTop="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_alignParentStart="true"  
 android:layout\_alignParentEnd="true" />  
</RelativeLayout>

**=>Coding part of MainActivity.java**

package com.example.myapplication;  
import android.os.Bundle;  
import android.widget.Toast;  
import androidx.annotation.NonNull;  
import androidx.appcompat.app.AppCompatActivity;  
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;  
public class MainActivity extends AppCompatActivity implements OnMapReadyCallback {  
 private GoogleMap mMap;  
 private double latitude = 0.0;  
 private double longitude = 0.0;  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 *// Obtain the SupportMapFragment and get notified when the map is ready to be used.* SupportMapFragment mapFragment = (SupportMapFragment)  
 getSupportFragmentManager()  
 .findFragmentById(R.id.*map*);  
 if (mapFragment != null) {  
 mapFragment.getMapAsync(this);  
 } else {  
 Toast.*makeText*(this, "Map Fragment Not Found", Toast.*LENGTH\_SHORT*).show();  
 }  
 }  
 @Override  
 public void onMapReady(@NonNull GoogleMap googleMap) {  
 mMap = googleMap;  
 *// Add a marker at current or given location and move the camera* LatLng location = new LatLng(latitude, longitude);  
 mMap.addMarker(new MarkerOptions().position(location).title("Marker"));  
 mMap.moveCamera(CameraUpdateFactory.*newLatLngZoom*(location, 15));  
 }  
}

**Coding part of AndroidManifest.xml**

*<?*xml version="1.0" encoding="utf-8"*?>*<manifest xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:tools="http://schemas.android.com/tools">  
 **<usespermission android:name="android.permission.ACCESS\_FINE\_LOCATION" />  
 <usespermission android:name="android.permission.ACCESS\_COARSE\_LOCATION" />  
 <usespermission android:name="android.permission.INTERNET" />**  
 <application  
 android:allowBackup="true"  
 android:dataExtractionRules="@xml/data\_extraction\_rules"  
 android:fullBackupContent="@xml/backup\_rules"  
 android:icon="@mipmap/ic\_launcher"  
 android:label="@string/app\_name"  
 android:roundIcon="@mipmap/ic\_launcher\_round"  
 android:supportsRtl="true"  
 android:theme="@style/Theme.MyApplication"  
 tools:targetApi="31">  
 **<metadata  
 android:name="com.google.android.geo.API\_KEY"  
 android:value="YOUR\_API\_KEY\_HERE" />**

<activity  
 android:name=".MainActivity"  
 android:exported="true">  
 <intent-filter>  
 <action android:name="android.intent.action.MAIN" />  
  
 <category android:name="android.intent.category.LAUNCHER" />  
 </intent-filter>  
 </activity>  
 </application>  
  
</manifest>

**13. Create an Application with Login module. Check User name and password. On successful login change textview “Login Successful”. On Login fail alert using Toast “Login Fail”**

**Steps:**

**1. Click New Project, the New Project Dialog box appears.**

**2. Choose Empty Views Activity then click Next.**

**3. Specify the Name of your project, Select the Language as Java, and Select the SDK as API 24(“Nougat”,Android 7.0).Click Finish Button.**

**4. Update the following code in activity\_main.xml and MainActivity.java**

**=>Coding part of Activity\_main.xml**

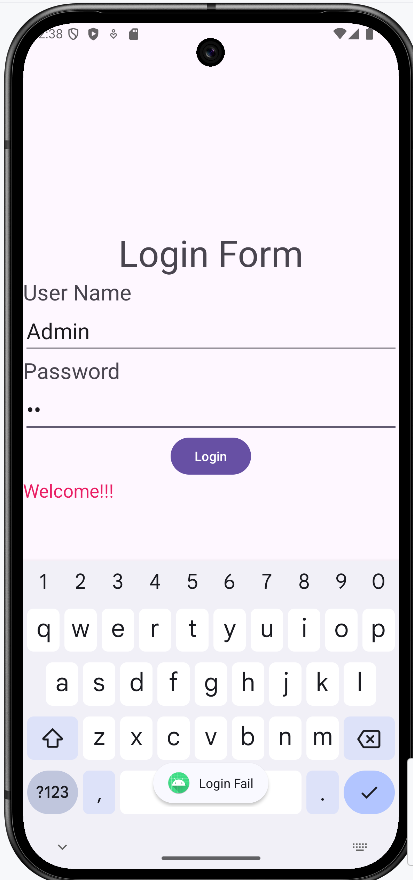
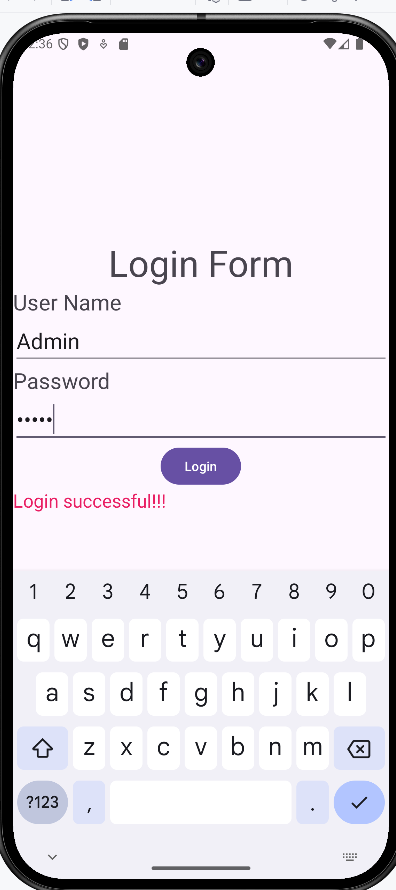
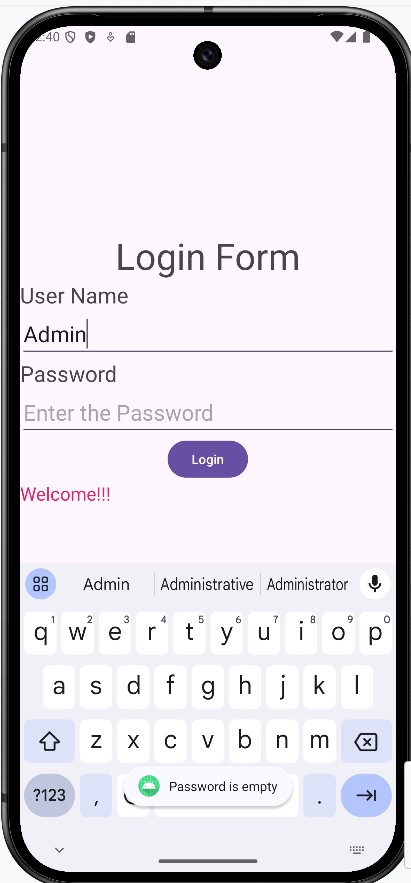
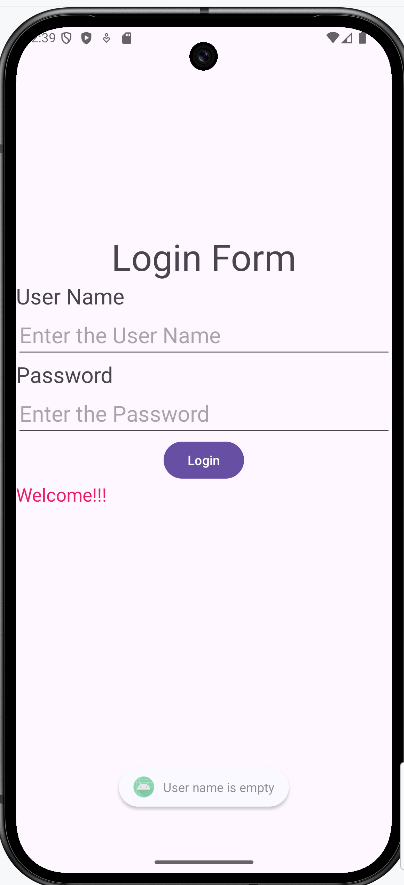
*<?*xml version="1.0" encoding="utf-8"*?>*<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:id="@+id/main"  
 **android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"**  
 tools:context=".MainActivity">  
  
 <TextView  
 android:id="@+id/tvTitle"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
  **android:layout\_gravity="center"  
 android:layout\_marginTop="200dp"  
 android:text="Login Form"  
 android:textSize="40sp"** />  
  
 <TextView  
 android:id="@+id/tvUserName"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:text="User Name"  
 android:textSize="24sp"** />  
  
 <EditText  
 android:id="@+id/etUserName"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 **android:hint="Enter the User Name"  
 android:inputType="text"  
 android:textSize="24sp"** />  
  
 <TextView  
 android:id="@+id/tvPassword"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:text="Password"  
 android:textSize="24sp"** />  
  
 <EditText  
 android:id="@+id/etPassword"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 **android:hint="Enter the Password"  
 android:inputType="textPassword"  
 android:textSize="24sp"** />  
  
 <Button  
 android:id="@+id/btnLogin"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:layout\_gravity="center"  
 android:onClick="onClick"  
 android:text="Login"** />  
  
 <TextView  
 android:id="@+id/tvMessage"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 **android:text="Welcome!!!"  
 android:textColor="#E91E63"  
 android:textSize="20sp"** />  
  
</LinearLayout>

**=>Coding part of MainActivity.java**

package com.example.loginapplication;  
  
import android.os.Bundle;  
**import android.widget.EditText;  
import android.widget.TextView;  
import android.widget.Toast;  
import android.view.View;**  
import androidx.activity.EdgeToEdge;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat;  
  
public class MainActivity extends AppCompatActivity {  
  
 **EditText etUserName,etPassword;  
 TextView tvMessage;**  
  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 EdgeToEdge.*enable*(this);  
 setContentView(R.layout.*activity\_main*);  
  
 **etUserName=(EditText)findViewById(R.id.*etUserName*);  
 etPassword=(EditText)findViewById(R.id.*etPassword*);  
 tvMessage=(TextView)findViewById(R.id.*tvMessage*);** }  
  
**public void onClick(View v)  
{  
  
 tvMessage.setText("Welcome!!!");  
 if(etUserName.getText().toString().isEmpty())  
 {  
 Toast.*makeText*(this,"User name is empty", Toast.*LENGTH\_LONG*).show();  
 return;  
 }  
 if(etPassword.getText().toString().isEmpty())  
 {  
 Toast.*makeText*(this,"Password is empty", Toast.*LENGTH\_LONG*).show();  
 return;  
 }  
 if(etUserName.getText().toString().equals("Admin") && etPassword.getText().toString().equals("Admin"))  
 {  
 tvMessage.setText("Login successful!!!");  
 }  
 else  
 {  
 Toast.*makeText*(this, "Login Fail", Toast.*LENGTH\_LONG*).show();  
 }  
}**

}

**=>OUTPUT OF THE PROGRAM**



**14. Learn to deploy Android applications**

Steps to Deploy an Android Application

**1. Prepare App (use Program 1 Hello world for this program)**

# Generate Signed APK (Android Package Kit):

* 1. In Android Studio, navigate to Build > Generate Signed Bundle/APK.
  2. Follow the prompts to create a new keystore or use an existing one. A keystore is a binary file that contains a set of private keys.
  3. Configure the build type (release) and signing configuration.
  4. Generate the signed APK file.

# Test your signed APK:

* 1. Before distributing your app, test the signed APK to ensure that the signing process didn't introduce any issues.
  2. Install the APK on various devices and perform thorough testing.
  3. Release on Google Play Console:
  4. Sign in to the Google Play Console (https://play.google.com/apps/publish).
  5. Create a new app entry if this is your first release or select an existing app.
  6. Complete all the required information for the app listing, including the title, description, screenshots, and categorization
  7. Upload your signed APK file.
  8. Set pricing and distribution options.
  9. Optimize your store listing for search and conversion.

Once everything is set, click the "Publish" button to release your app to the Google Play Store.

# 4. Other Distribution Channels (Optional):

* + Besides Google Play, you can distribute your app through other channels such as Amazon Appstore, Samsung Galaxy Store, or third party app marketplaces.
  + Each distribution channel may have its own requirements and submission process, so be sure to follow their guidelines.

# 5. Monitor and Update:

* + Keep an eye on user feedback and app performance metrics through the Google Play Console.
  + Regularly update your app to fix bugs, add new features, and improve user experience based on feedback.