MOBILE APPLICATION DEVELOPMENT LAB

1. Develop an Android application for finding the biggest and smallest among the three numbers given as input through EditText controls and use Toast control to display the output.

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/tvTitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="82dp"
        android:layout_marginTop="128dp"
        android:layout_marginEnd="47dp"
        android:layout_marginBottom="547dp"
        android:gravity="center"
        android:text="@string/tvTitle"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/tvA"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="26dp"
        android:layout_marginTop="219dp"
        android:layout_marginEnd="253dp"
        android:layout_marginBottom="488dp"
        android:text="@string/tvA"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText
        android:id="@+id/txtA"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="194dp"
        android:layout_marginTop="205dp"
        android:layout_marginEnd="7dp"
        android:layout_marginBottom="481dp"
        android:ems="10"
        android:inputType="text"
        android:text="@string/txtA"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"

tools:ignore="Autofill,LabelFor,SpeakableTextPresentCheck,TouchTargetSize
Check" />

    <TextView
        android:id="@+id/tvB"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="28dp"
        android:layout_marginTop="284dp"
        android:layout_marginEnd="252dp"
        android:layout_marginBottom="423dp"
        android:text="@string/tvB"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText
        android:id="@+id/txtB"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="194dp"
        android:layout_marginTop="274dp"
        android:layout_marginEnd="7dp"
        android:layout_marginBottom="412dp"
        android:ems="10"
        android:inputType="text"
        android:text="@string/txtB"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"

tools:ignore="Autofill,LabelFor,SpeakableTextPresentCheck,TouchTargetSize
Check" />

    <TextView
        android:id="@+id/tvC"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="27dp"
        android:layout_marginTop="343dp"
        android:layout_marginEnd="252dp"
        android:layout_marginBottom="364dp"
        android:text="@string/tvC"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText
        android:id="@+id/txtC"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="191dp"
        android:layout_marginTop="335dp"
        android:layout_marginEnd="10dp"
        android:layout_marginBottom="351dp"
        android:ems="10"
        android:inputType="text"
        android:text="@string/txtC"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"

tools:ignore="Autofill,LabelFor,SpeakableTextPresentCheck,TouchTargetSize
Check" />

    <Button
```

```
        android:id="@+id/btnFindBiggest"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="31dp"
        android:layout_marginTop="403dp"
        android:layout_marginEnd="210dp"
        android:layout_marginBottom="278dp"
        android:text="@string/btnFindBiggest"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/btnFindSmallest"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="220dp"
        android:layout_marginTop="402dp"
        android:layout_marginEnd="10dp"
        android:layout_marginBottom="279dp"
        android:text="@string/btnFindSmallest"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

strings.xml

```
<resources>
    <string name="app_name">BigSmall3</string>
    <string name="tvTitle">Biggest and Smallest among\n Three
Numbers</string>
    <string name="tvA">Enter value for A</string>
    <string name="txtA">""</string>
    <string name="tvB">Enter value for B</string>
    <string name="txtB">""</string>
    <string name="tvC">Enter value for C</string>
    <string name="txtC">""</string>
    <string name="btnFindBiggest">Find Biggest</string>
    <string name="btnFindSmallest">Find Smallest</string>
</resources>
```

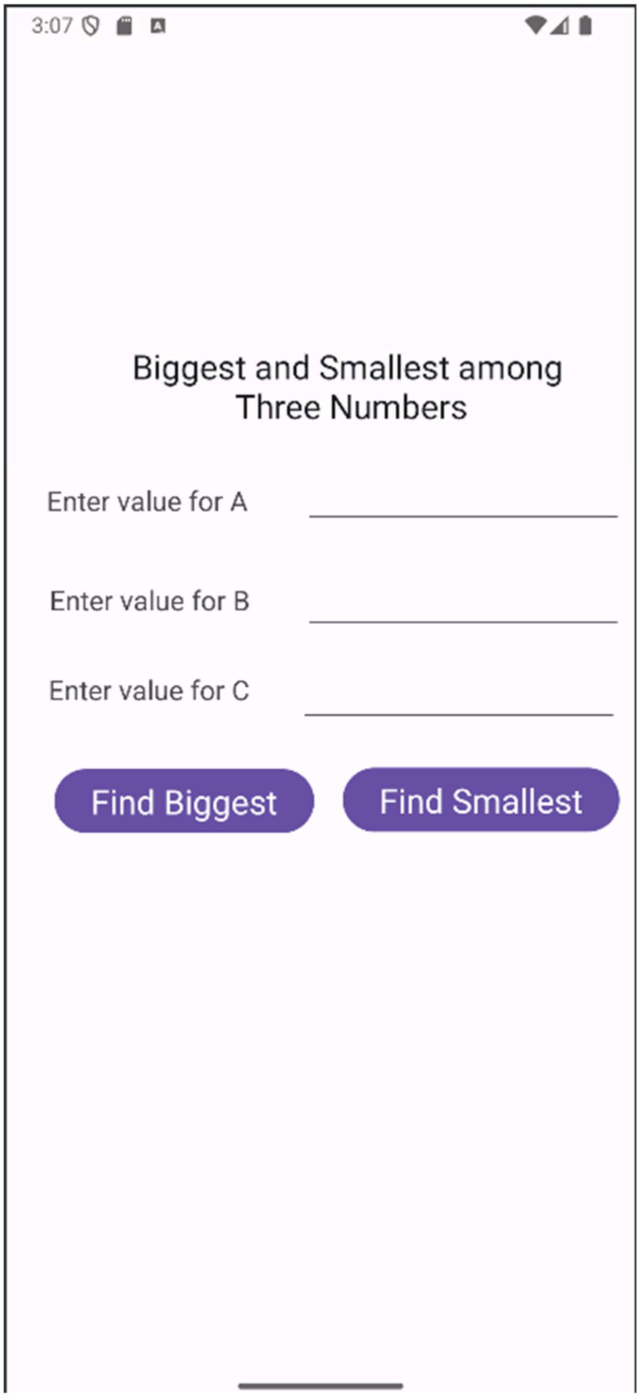
MainActivity.java

```
package com.example.bigsmall3;

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 UI Control classes from Packages
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import android.view.View;

/** @noinspection ALL*/
public class MainActivity extends AppCompatActivity {

    // Creating Objects (Instances) for UI Control classes
    EditText ta,tb,tc;
    Button findBig, findSmall;
    double a,b,c,big,small;


    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

        // Your Code Begins Here
        // Instantiating the objects by capturing the UI Controls from Layout
        ta = (EditText) findViewById(R.id.txtA);
        tb = (EditText) findViewById(R.id.txtB);
        tc = (EditText) findViewById(R.id.txtC);
        findBig = (Button) findViewById(R.id.btnFindBiggest);
        findSmall = (Button) findViewById(R.id.btnFindSmallest);

        findBig.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Obtaining values from the Objects (Instances) of UI Control
classes
```

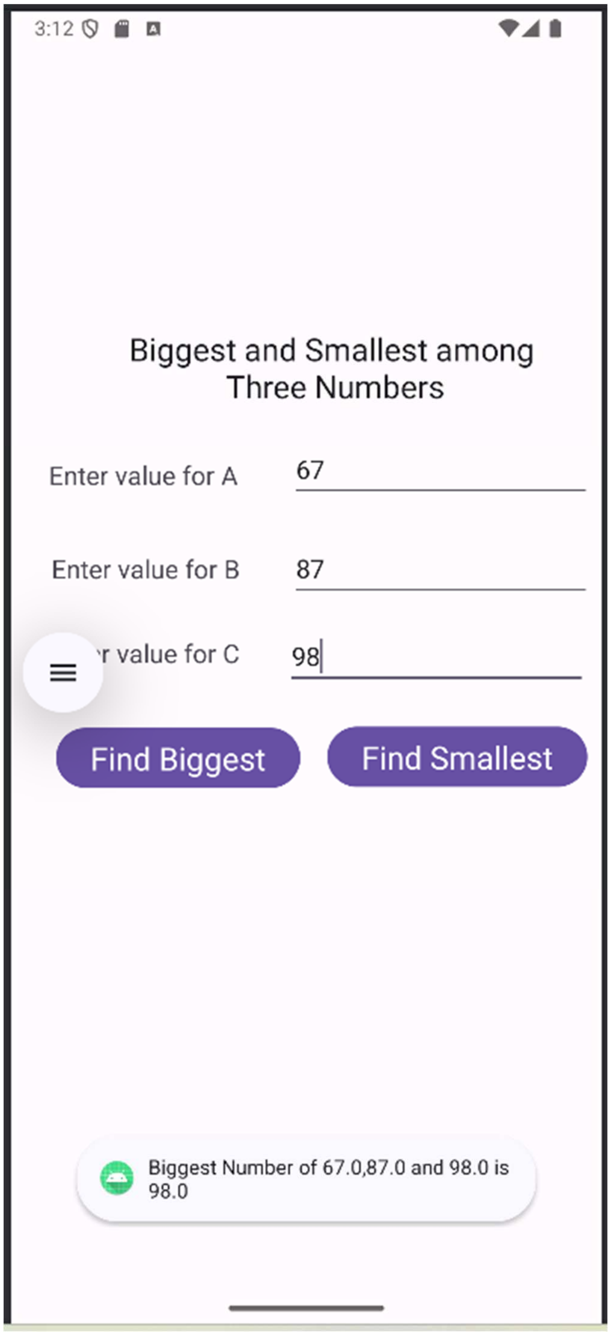
```
                a=Double.parseDouble(ta.getText().toString());
                b=Double.parseDouble(tb.getText().toString());
                c=Double.parseDouble(tc.getText().toString());
                //big=(a>b && a>c)?a:(b>c?b:c);
                if (a>b && a>c)
                    big=a;
                else if (b>c)
                    big=b;
                else
                    big=c;
                // Display the result using Toast
                Toast.makeText(getApplicationContext(),"Biggest Number of
"+a+","+b+" and "+c+" is "+big,Toast.LENGTH_SHORT).show();
            }
        });

        findSmall.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Obtaining values from the Objects (Instances) of UI Control
classes
                a=Double.parseDouble(ta.getText().toString());
                b=Double.parseDouble(tb.getText().toString());
                c=Double.parseDouble(tc.getText().toString());
                //big=(a>b && a>c)?a:(b>c?b:c);
                if (a<b && a<c)
                    small=a;
                else if (b<c)
                    small=b;
                else
                    small=c;
                // Display the result using Toast
                Toast.makeText(getApplicationContext(),"Smallest Number of
"+a+","+b+" and "+c+" is "+small,Toast.LENGTH_SHORT).show();
            }
        });
        // Your Code Ends Here


        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;
        });
    }
}
```

INPUT



OUTPUT



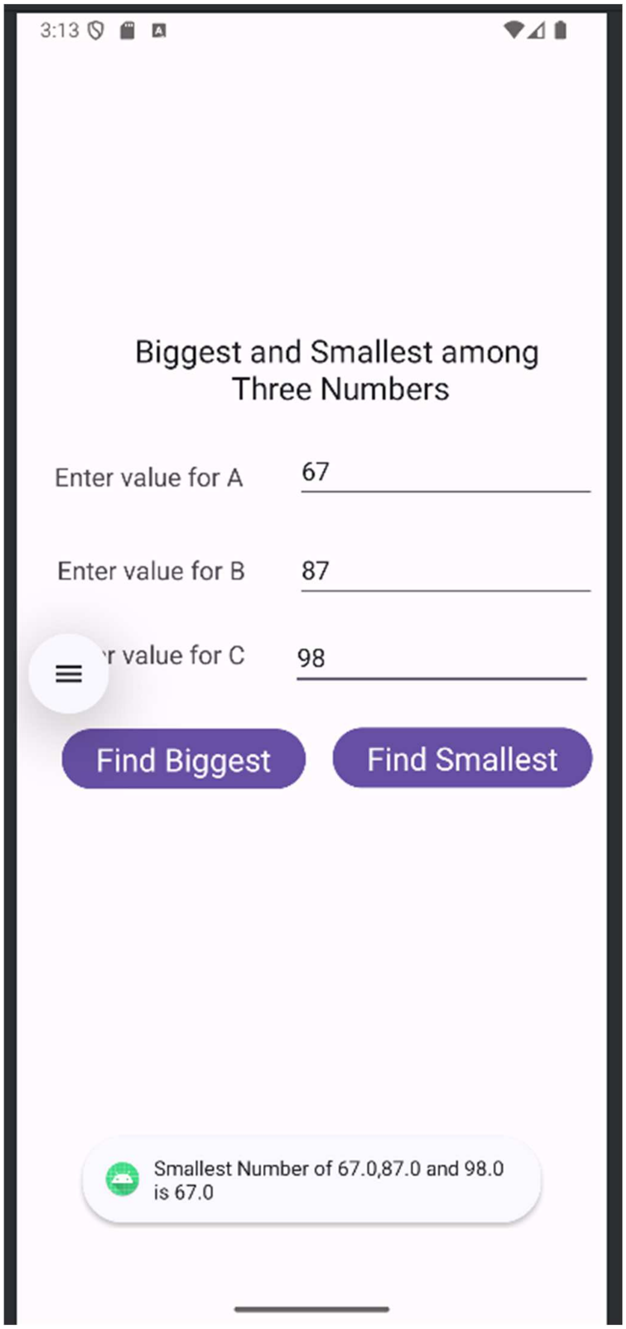
Biggest and Smallest among Three Numbers

Enter value for A 67

Enter value for B 87

Enter value for C 98

Biggest Number of 67.0,87.0 and 98.0 is 98.0



Biggest and Smallest among Three Numbers

Enter value for A 67

Enter value for B 87

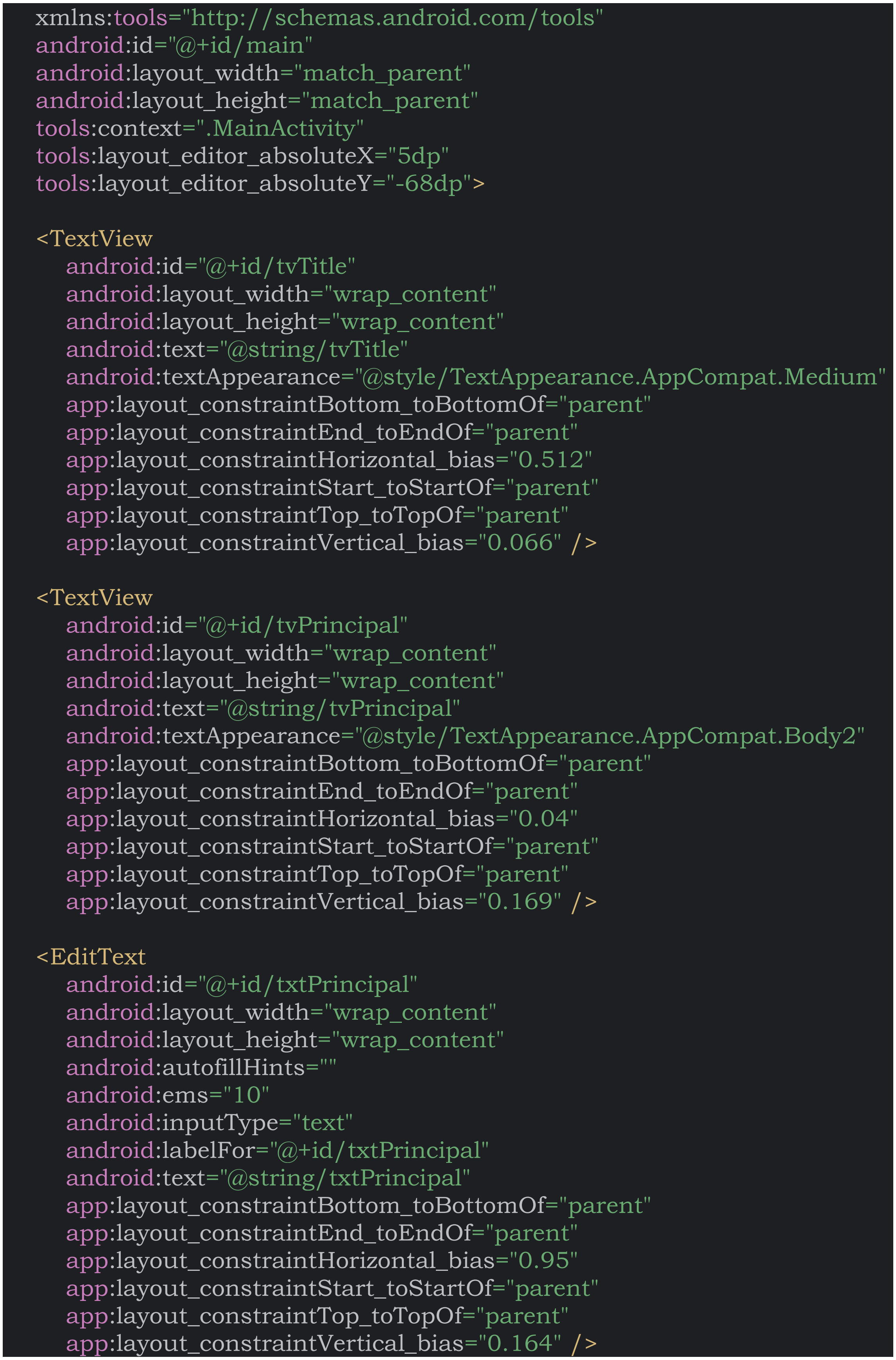
r value for C 98

Smallest Number of 67.0,87.0 and 98.0 is 67.0

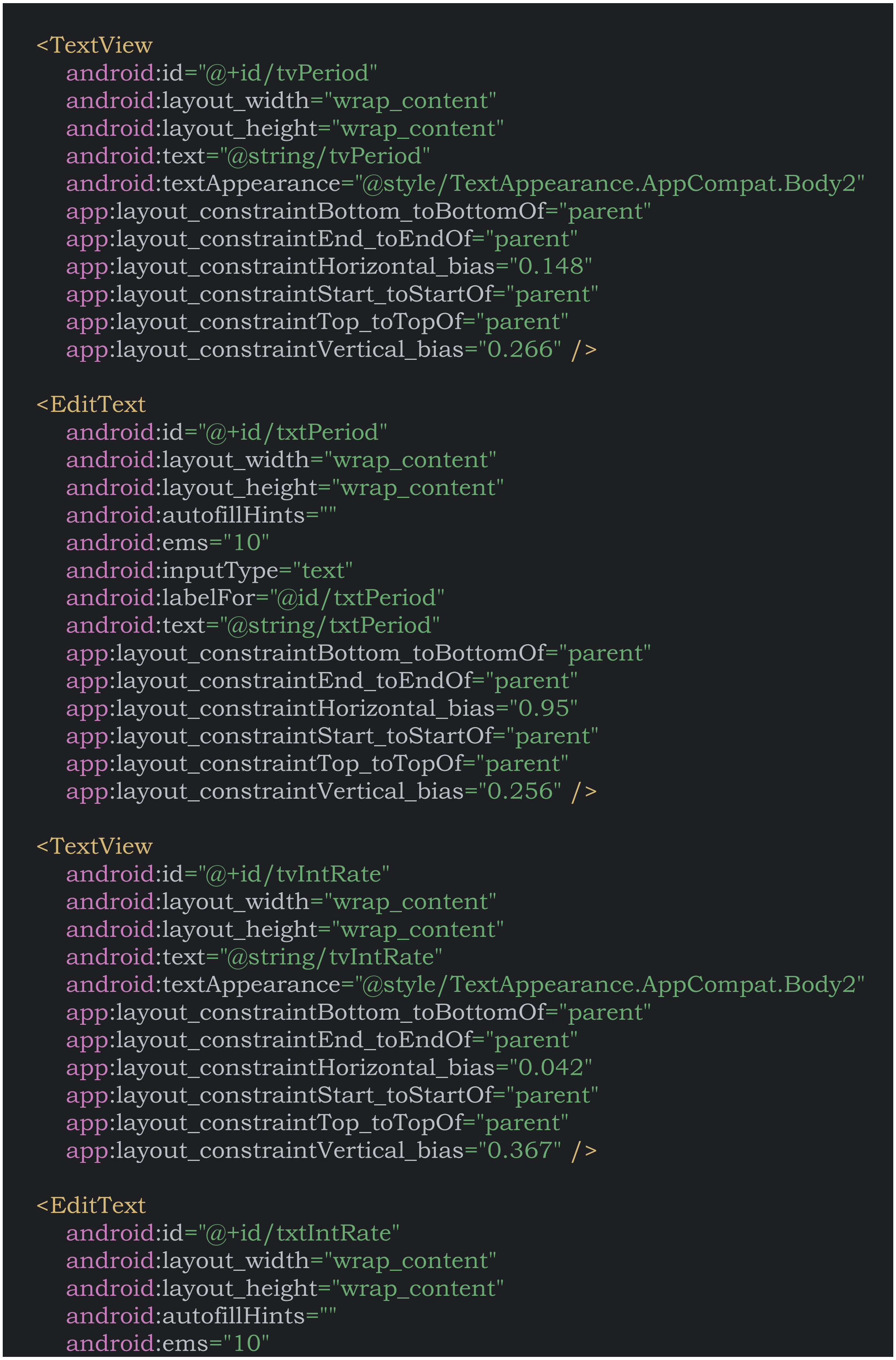
2. Develop an android application for computing simple and compound interest with and without principal amount. Inputs are given through EditText controls and use Toast control to display the output.

activity_main.xml

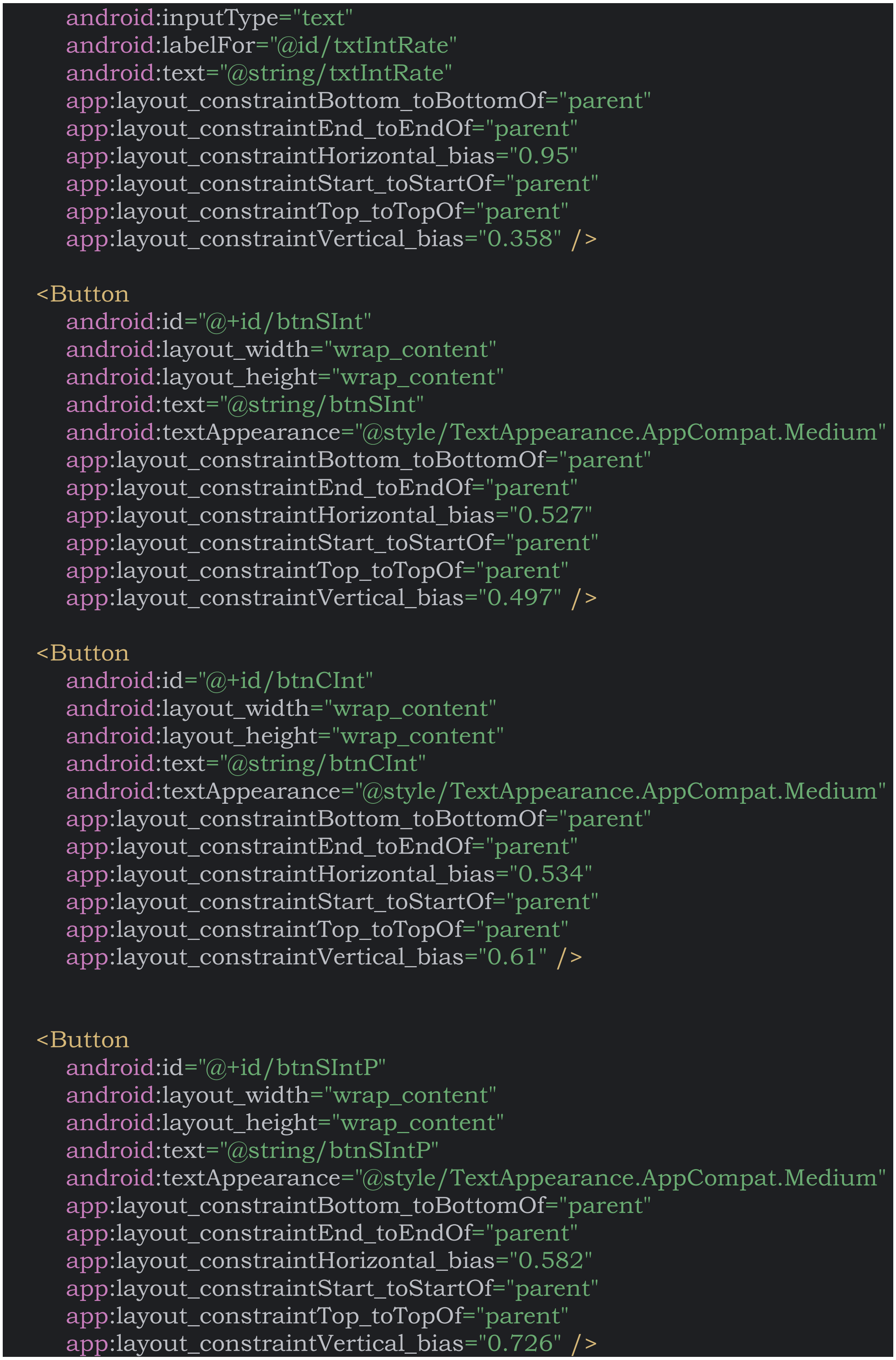
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
```



```
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    tools:layout_editor_absoluteX="5dp"
    tools:layout_editor_absoluteY="-68dp">

    <TextView
        android:id="@+id/tvTitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/tvTitle"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.512"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.066" />

    <TextView
        android:id="@+id/tvPrincipal"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/tvPrincipal"
        android:textAppearance="@style/TextAppearance.AppCompat.Body2"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.04"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.169" />

    <EditText
        android:id="@+id/txtPrincipal"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:autofillHints=""
        android:ems="10"
        android:inputType="text"
        android:labelFor="@+id/txtPrincipal"
        android:text="@string/txtPrincipal"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.95"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.164" />
```



```xml
<TextView
    android:id="@+id/tvPeriod"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/tvPeriod"
    android:textAppearance="@style/TextAppearance.AppCompat.Body2"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.148"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.266" />

<EditText
    android:id="@+id/txtPeriod"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:autofillHints=""
    android:ems="10"
    android:inputType="text"
    android:labelFor="@id/txtPeriod"
    android:text="@string/txtPeriod"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.95"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.256" />

<TextView
    android:id="@+id/tvIntRate"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/tvIntRate"
    android:textAppearance="@style/TextAppearance.AppCompat.Body2"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.042"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.367" />

<EditText
    android:id="@+id/txtIntRate"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:autofillHints=""
    android:ems="10"
```



```
        android:inputType="text"
        android:labelFor="@id/txtIntRate"
        android:text="@string/txtIntRate"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.95"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.358" />

    <Button
        android:id="@+id/btnSInt"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/btnSInt"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.527"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.497" />

    <Button
        android:id="@+id/btnCInt"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/btnCInt"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.534"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.61" />


    <Button
        android:id="@+id/btnSIntP"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/btnSIntP"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.582"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.726" />
```

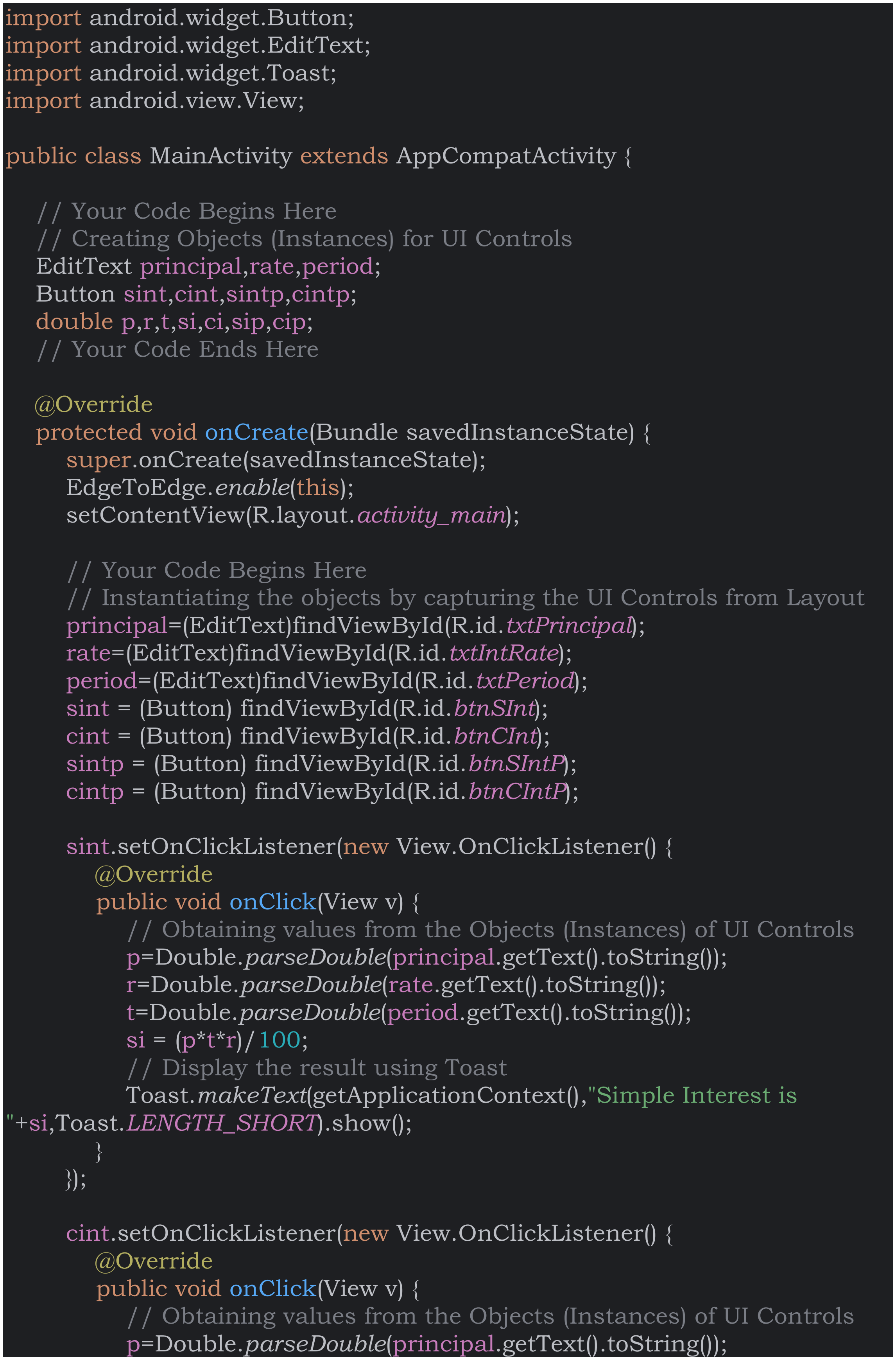
```
   <Button
      android:id="@+id/btnCIntP"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="@string/btnCIntP"
      android:textAppearance="@style/TextAppearance.AppCompat.Medium"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintHorizontal_bias="0.582"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent"
      app:layout_constraintVertical_bias="0.849" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

strings.xml

```
<resources>
   <string name="app_name">SimpleCompoundInterest</string>
   <string name="tvTitle">Simple and Compound Interest
Calculator</string>
   <string name="tvPrincipal">Enter principal amount</string>
   <string name="txtPrincipal">""</string>
   <string name="tvPeriod">Enter time period</string>
   <string name="txtPeriod">""</string>
   <string name="tvIntRate">Enter rate of Interest (%)</string>
   <string name="txtIntRate">""</string>
   <string name="btnSInt">Calculate Simple Interest</string>
   <string name="btnCInt">Calculate Compound Interest</string>
   <string name="btnSIntP">Calculate Simple Interest with Principal
Amount</string>
   <string name="btnCIntP">Calculate Compound Interest with Principal
Amount</string>
</resources>
```

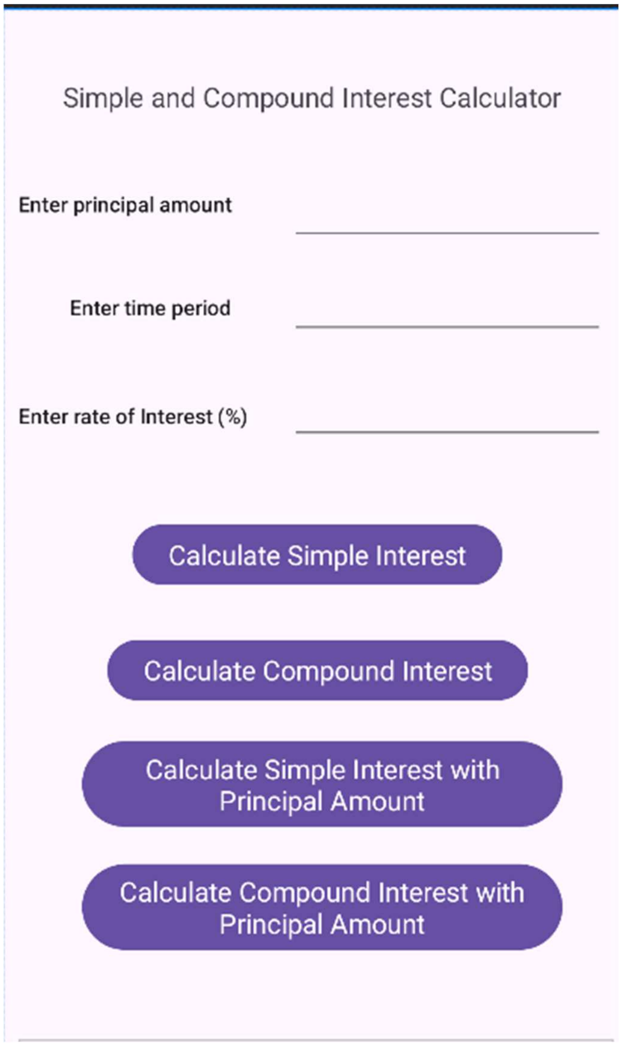
MainActivity.java

```
package com.example.simplecompoundinterest;

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 Packages for UI Controls
```

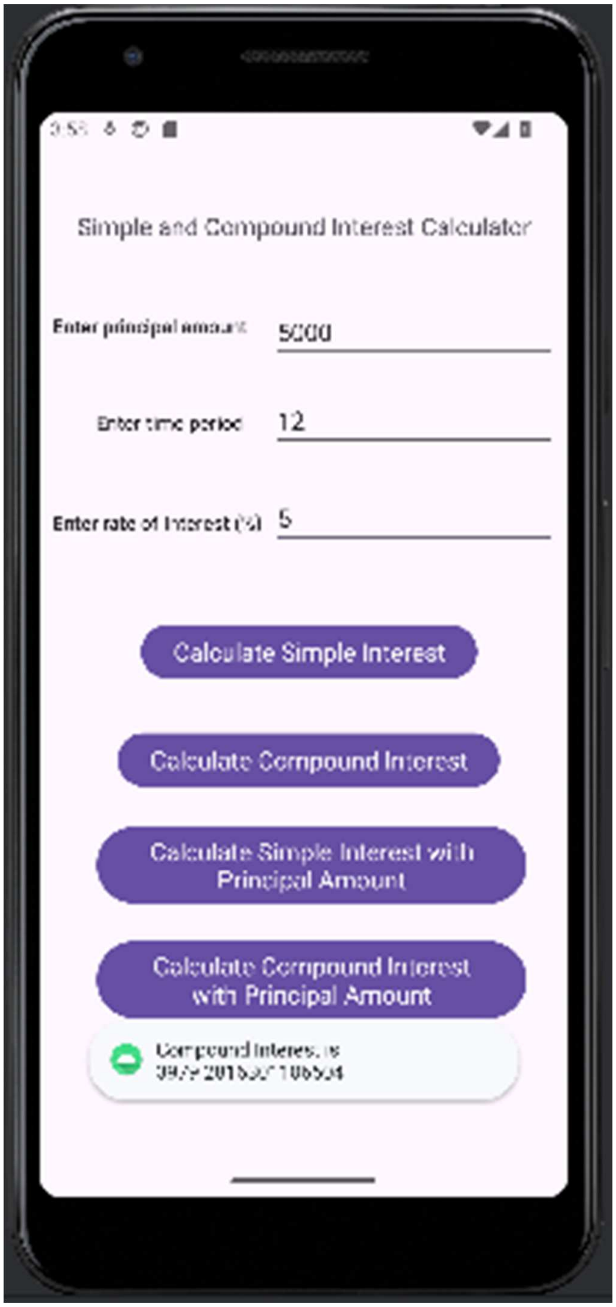


```
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import android.view.View;

public class MainActivity extends AppCompatActivity {

    // Your Code Begins Here
    // Creating Objects (Instances) for UI Controls
    EditText principal,rate,period;
    Button sint,cint,sintp,cintp;
    double p,r,t,si,ci,sip,cip;
    // Your Code Ends Here

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

        // Your Code Begins Here
        // Instantiating the objects by capturing the UI Controls from Layout
        principal=(EditText)findViewById(R.id.txtPrincipal);
        rate=(EditText)findViewById(R.id.txtIntRate);
        period=(EditText)findViewById(R.id.txtPeriod);
        sint = (Button) findViewById(R.id.btnSInt);
        cint = (Button) findViewById(R.id.btnCInt);
        sintp = (Button) findViewById(R.id.btnSIntP);
        cintp = (Button) findViewById(R.id.btnCIntP);

        sint.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Obtaining values from the Objects (Instances) of UI Controls
                p=Double.parseDouble(principal.getText().toString());
                r=Double.parseDouble(rate.getText().toString());
                t=Double.parseDouble(period.getText().toString());
                si = (p*t*r)/100;
                // Display the result using Toast
                Toast.makeText(getApplicationContext(),"Simple Interest is
"+si,Toast.LENGTH_SHORT).show();
            }
        });

        cint.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Obtaining values from the Objects (Instances) of UI Controls
                p=Double.parseDouble(principal.getText().toString());
                r=Double.parseDouble(rate.getText().toString());
                t=Double.parseDouble(period.getText().toString());
                double amount = p*Math.pow((1+r/100),t);
                ci = amount-p;
                // Display the result using Toast
                Toast.makeText(getApplicationContext(),"Compound Interest is
"+ci,Toast.LENGTH_SHORT).show();
            }
        });

        sintp.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Obtaining values from the Objects (Instances) of UI Controls
                p=Double.parseDouble(principal.getText().toString());
                r=Double.parseDouble(rate.getText().toString());
                t=Double.parseDouble(period.getText().toString());
                sip = ((p*t*r)/100)+p;
                // Display the result using Toast
                Toast.makeText(getApplicationContext(),"Simple Interest with
Principal Amount is "+sip,Toast.LENGTH_SHORT).show();
            }
        });

        cintp.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Obtaining values from the Objects (Instances) of UI Controls
                p=Double.parseDouble(principal.getText().toString());
                r=Double.parseDouble(rate.getText().toString());
                t=Double.parseDouble(period.getText().toString());
                cip= p*Math.pow((1+r/100),t);
                // Display the result using Toast
                Toast.makeText(getApplicationContext(),"Compound Interest with
Principal Amount is "+cip,Toast.LENGTH_SHORT).show();
            }
        });
        // Your Code Ends Here

        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;
        });
    }
}
```

INPUT


Simple and Compound Interest Calculator
Enter principal amount
Enter time period
Enter rate of Interest (%)
Calculate Simple Interest
Calculate Compound Interest
Calculate Simple Interest with Principal Amount
Calculate Compound Interest with Principal Amount

OUTPUT



Simple and Compound Interest Calculator

Enter principal amount 5000

Enter time period 12

Enter rate of Interest (%) 5

Calculate Simple Interest
Calculate Compound Interest
Calculate Simple Interest with Principal Amount
Calculate Compound Interest with Principal Amount

Compound Interest is 3979.281630710654

3. Develop an android application for evaluating the postfix expression given as input through EditText controls and use Toast control to display the output.

activity_main.xml

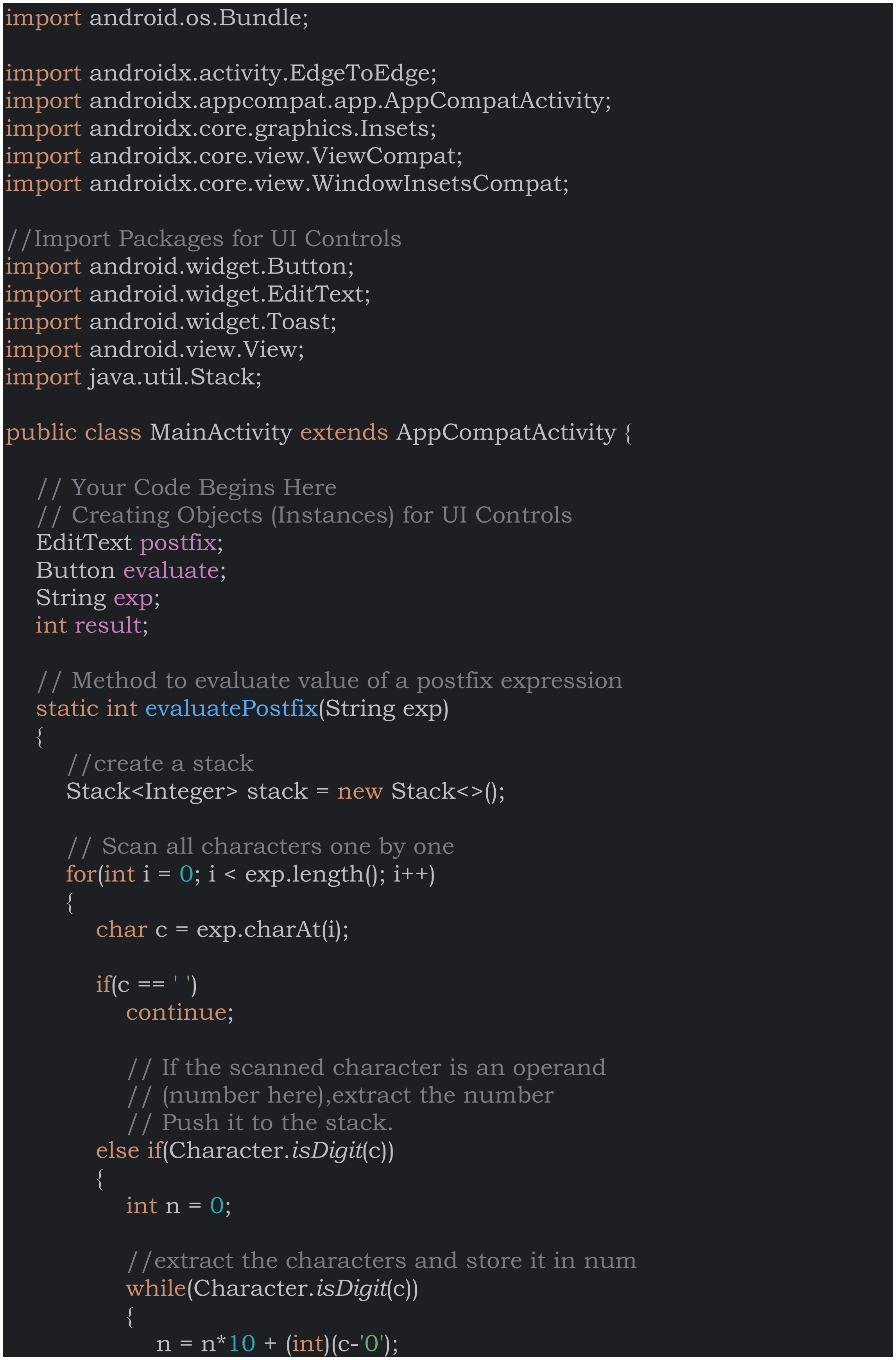
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    tools:layout_editor_absoluteX="-2dp"
    tools:layout_editor_absoluteY="100dp">

    <TextView
        android:id="@+id/tvTitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/tvTitle"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.155" />

    <TextView
        android:id="@+id/tvPostFix"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:gravity="center_horizontal"
        android:lines="2"
        android:maxLines="4"
        android:singleLine="false"
        android:text="@string/tvPostFix"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.453"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.274" />
    <EditText
        android:id="@+id/txtPostFix"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:autofillHints=""
        android:ems="10"
        android:inputType="text"
        android:labelFor="@id/txtPostFix"
        android:text="@string/txtPostFix"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.487"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.395"
        tools:text="@string/txtPostFix" />

    <Button
        android:id="@+id/btnEvaluate"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/btnEvaluate"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.509"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.547" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

strings.xml

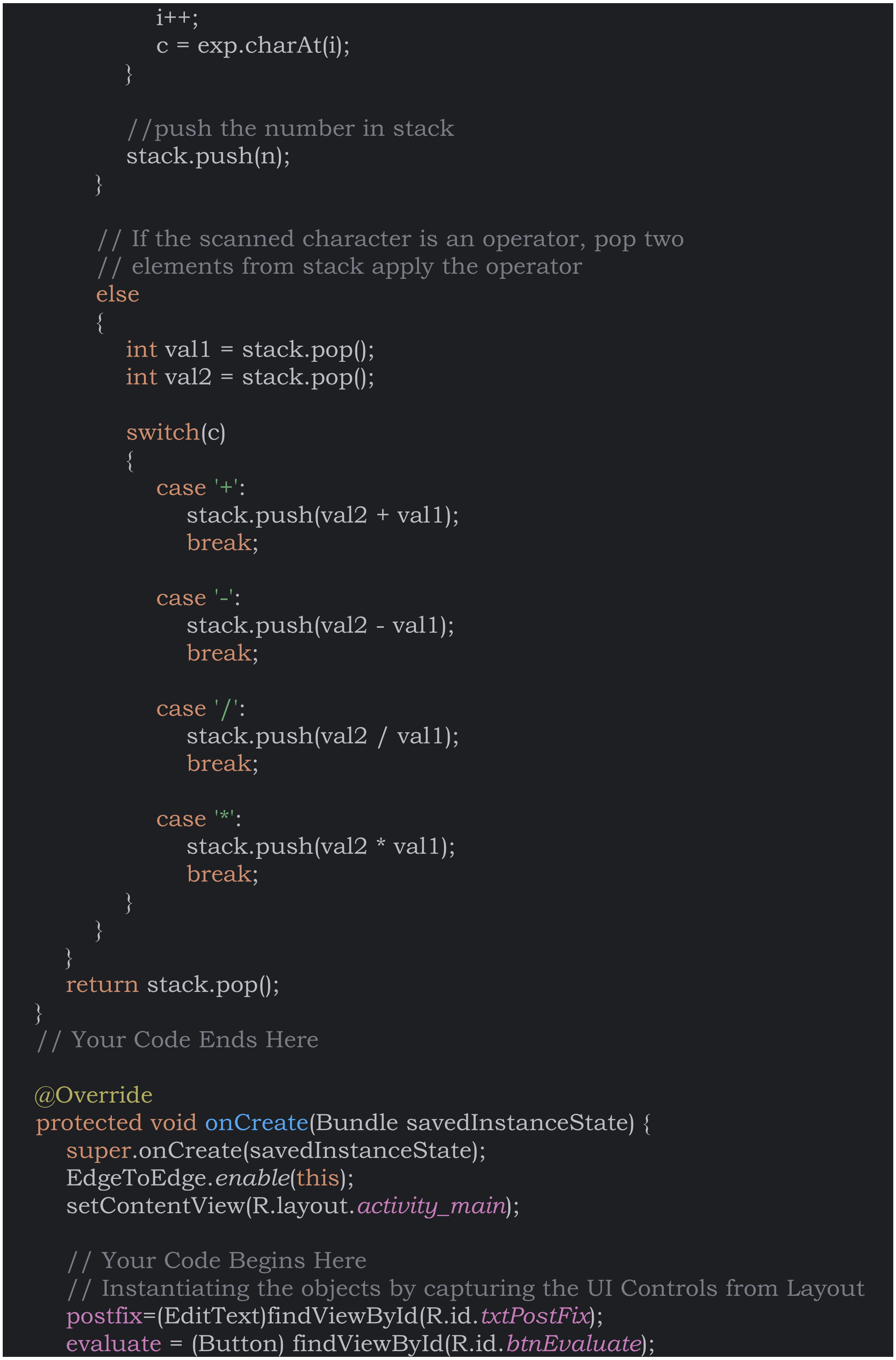
```
<resources>
    <string name="app_name">PostFixEvaluation</string>
    <string name="tvTitle">Evaluation of Postfix Expression</string>
    <string name="tvPostFix" translatable="false" >Enter Postfix Expression
\n (Leave a blankspace between tokens)</string>
    <string name="txtPostFix">""</string>
    <string name="btnEvaluate">Evaluate the PostFix Expression</string>
</resources>
```

MainActivity.java

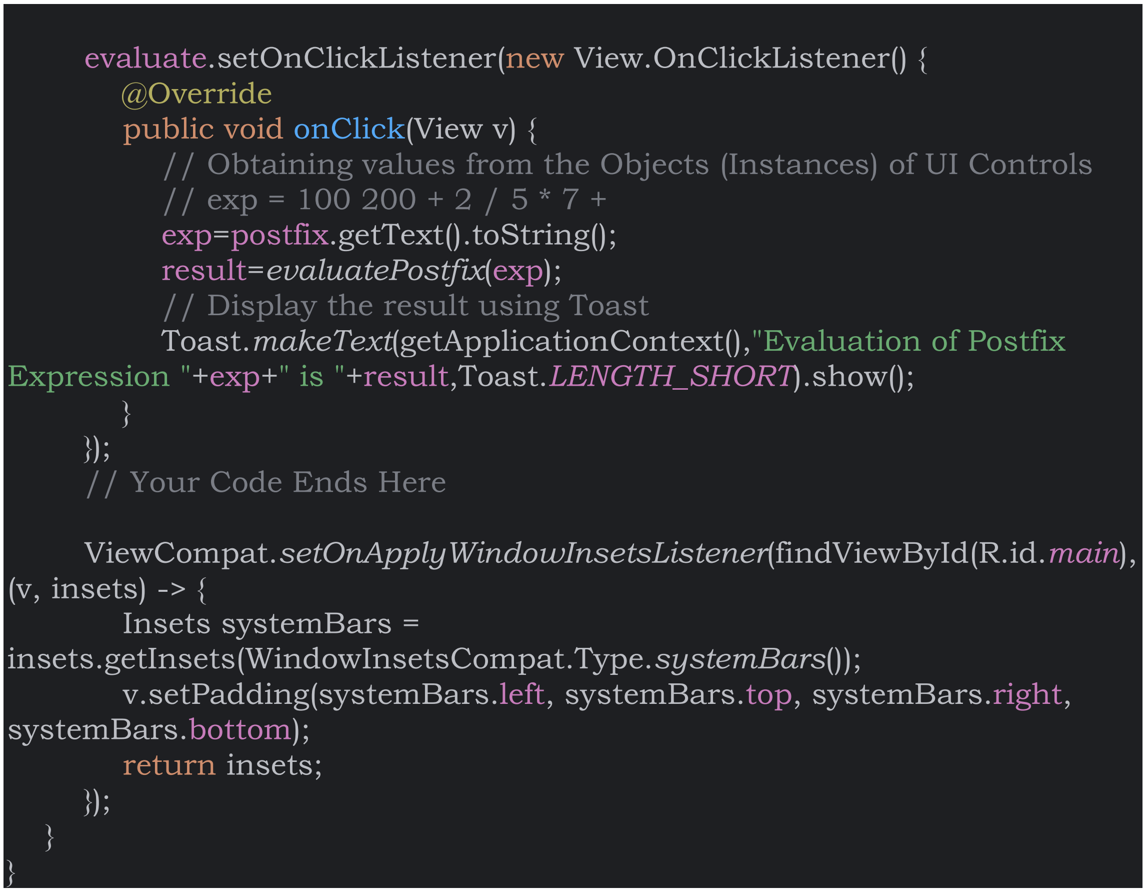
```
package com.example.postfixevaluation;
```



```java
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 Packages for UI Controls
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import android.view.View;
import java.util.Stack;

public class MainActivity extends AppCompatActivity {

    // Your Code Begins Here
    // Creating Objects (Instances) for UI Controls
    EditText postfix;
    Button evaluate;
    String exp;
    int result;

    // Method to evaluate value of a postfix expression
    static int evaluatePostfix(String exp)
    {
        //create a stack
        Stack<Integer> stack = new Stack<>();

        // Scan all characters one by one
        for(int i = 0; i < exp.length(); i++)
        {
            char c = exp.charAt(i);

            if(c == ' ')
                continue;

                // If the scanned character is an operand
                // (number here),extract the number
                // Push it to the stack.
            else if(Character.isDigit(c))
            {
                int n = 0;

                //extract the characters and store it in num
                while(Character.isDigit(c))
                {
                    n = n*10 + (int)(c-'0');
```

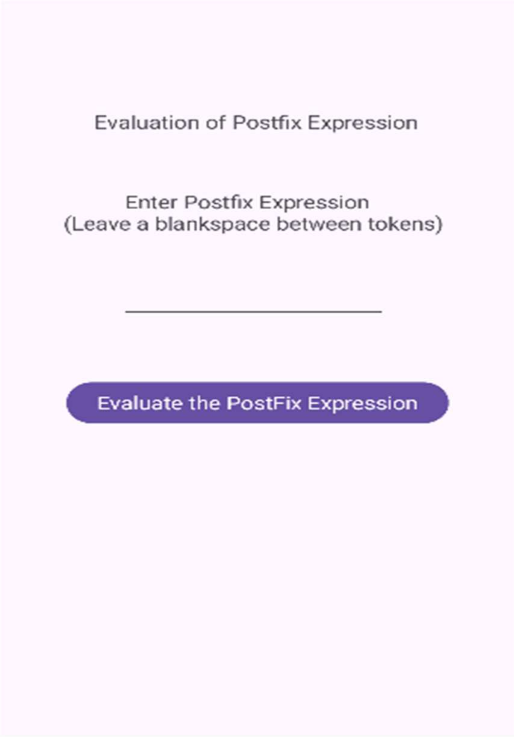


```
                i++;
                c = exp.charAt(i);
            }

            //push the number in stack
            stack.push(n);
        }

        // If the scanned character is an operator, pop two
        // elements from stack apply the operator
        else
        {
            int val1 = stack.pop();
            int val2 = stack.pop();

            switch(c)
            {
                case '+':
                    stack.push(val2 + val1);
                    break;

                case '-':
                    stack.push(val2 - val1);
                    break;

                case '/':
                    stack.push(val2 / val1);
                    break;

                case '*':
                    stack.push(val2 * val1);
                    break;
            }
        }
    }
    return stack.pop();
}
// Your Code Ends Here

@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    EdgeToEdge.enable(this);
    setContentView(R.layout.activity_main);

    // Your Code Begins Here
    // Instantiating the objects by capturing the UI Controls from Layout
    postfix=(EditText)findViewById(R.id.txtPostFix);
    evaluate = (Button) findViewById(R.id.btnEvaluate);
```



```
        evaluate.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Obtaining values from the Objects (Instances) of UI Controls
                // exp = 100 200 + 2 / 5 * 7 +
                exp=postfix.getText().toString();
                result=evaluatePostfix(exp);
                // Display the result using Toast
                Toast.makeText(getApplicationContext(),"Evaluation of Postfix
Expression "+exp+" is "+result,Toast.LENGTH_SHORT).show();
            }
        });
        // Your Code Ends Here

        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;
        });
    }
}
```

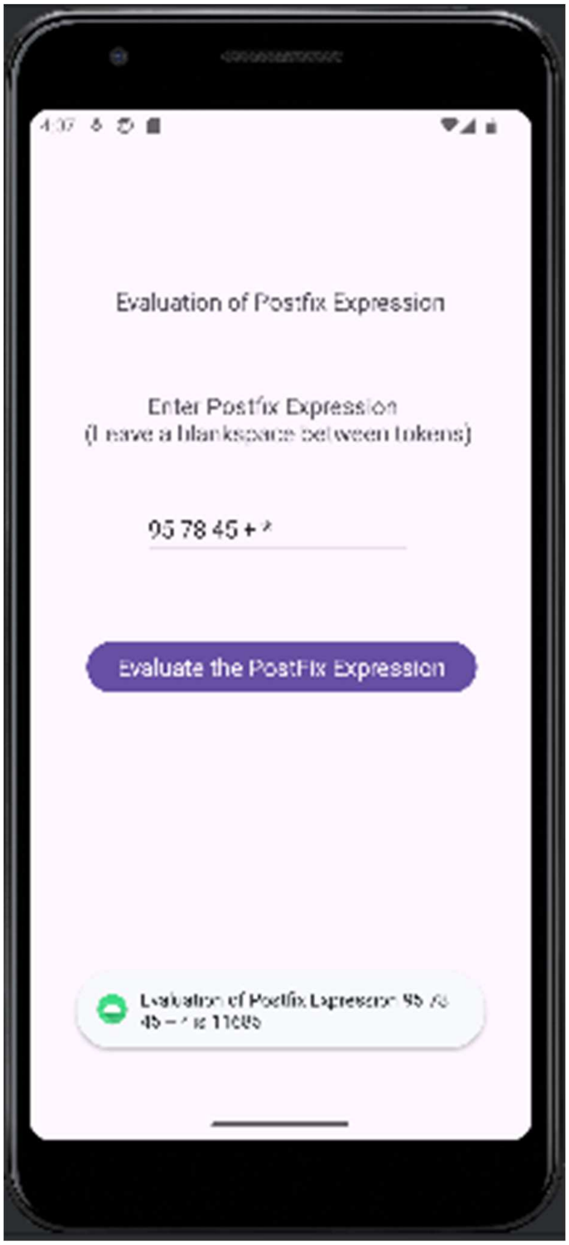
INPUT



Evaluation of Postfix Expression

Enter Postfix Expression
(Leave a blankspace between tokens)

OUTPUT



Evaluation of Postfix Expression

Enter Postfix Expression
(Leave a blankspace between tokens)

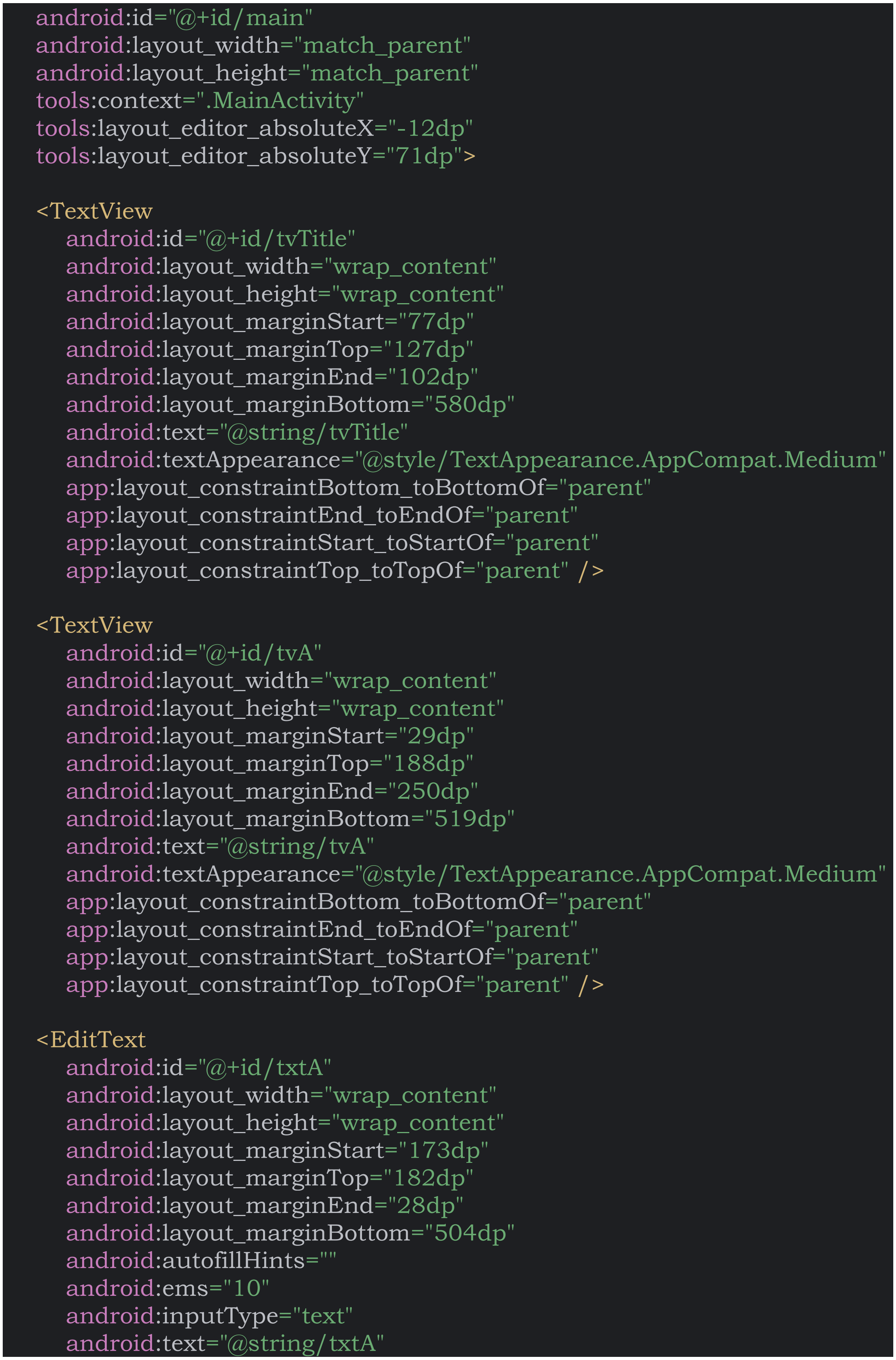
95 78 45 + *

Evaluation of Postfix Expression 95 78 45 + * is 11685

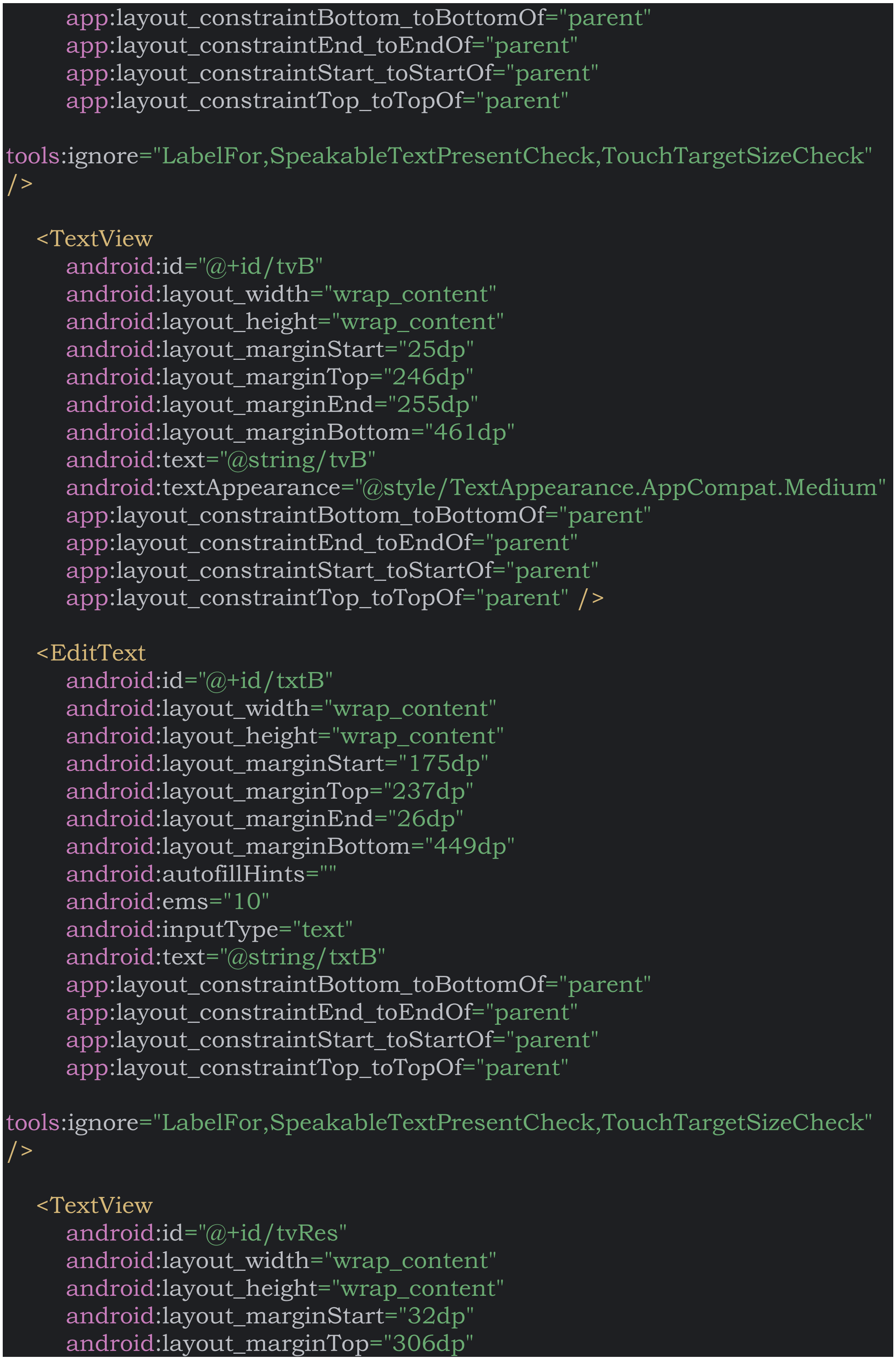
4. Develop an Android application for performing simple arithmetic operations for the two numbers given as input through EditText controls and use another EditText control to display the result.

activity_main.xml

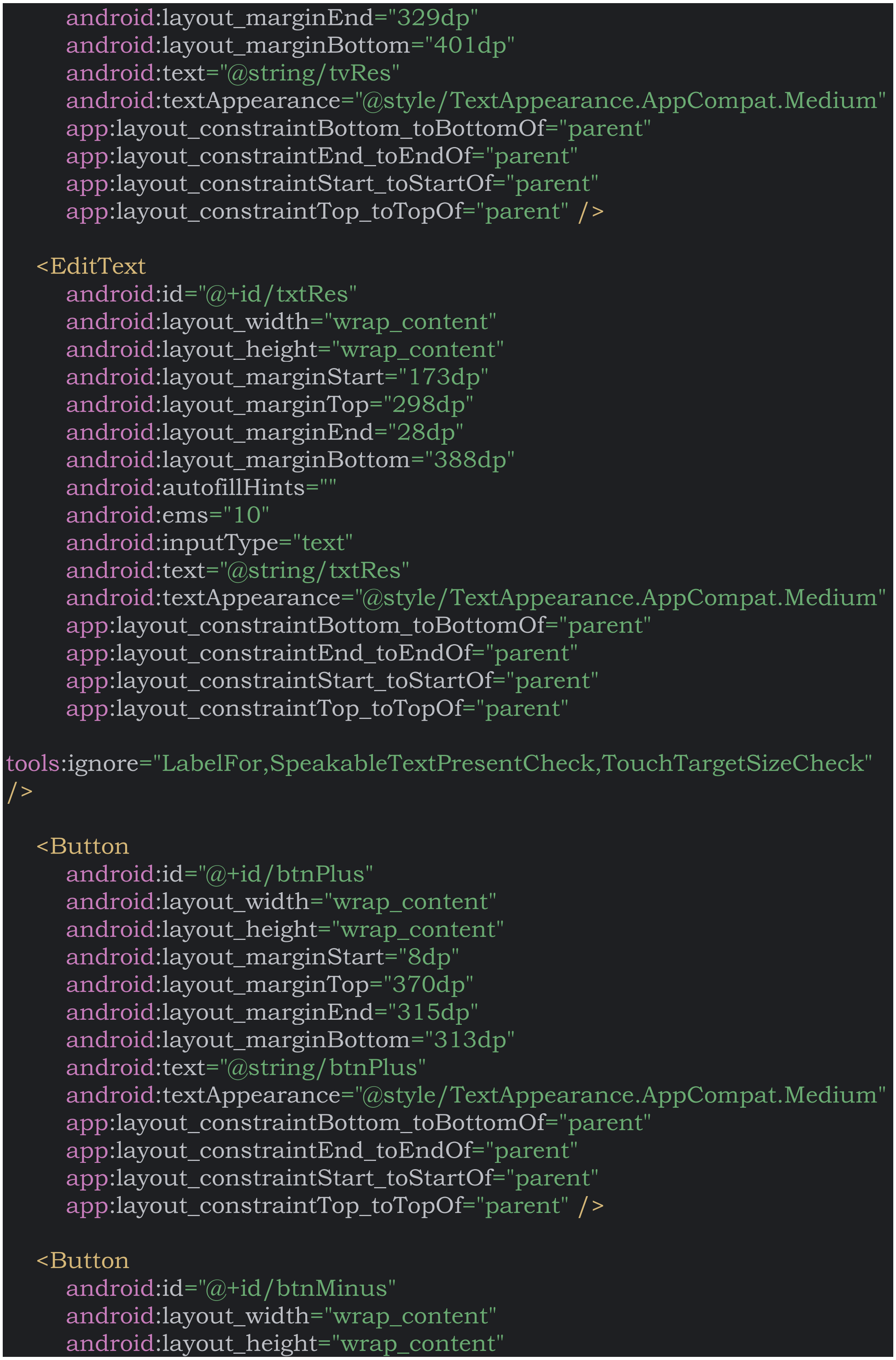
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
```



```
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    tools:layout_editor_absoluteX="-12dp"
    tools:layout_editor_absoluteY="71dp">

    <TextView
        android:id="@+id/tvTitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="77dp"
        android:layout_marginTop="127dp"
        android:layout_marginEnd="102dp"
        android:layout_marginBottom="580dp"
        android:text="@string/tvTitle"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/tvA"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="29dp"
        android:layout_marginTop="188dp"
        android:layout_marginEnd="250dp"
        android:layout_marginBottom="519dp"
        android:text="@string/tvA"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText
        android:id="@+id/txtA"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="173dp"
        android:layout_marginTop="182dp"
        android:layout_marginEnd="28dp"
        android:layout_marginBottom="504dp"
        android:autofillHints=""
        android:ems="10"
        android:inputType="text"
        android:text="@string/txtA"
```



```
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"

tools:ignore="LabelFor,SpeakableTextPresentCheck,TouchTargetSizeCheck"
/>

    <TextView
        android:id="@+id/tvB"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="25dp"
        android:layout_marginTop="246dp"
        android:layout_marginEnd="255dp"
        android:layout_marginBottom="461dp"
        android:text="@string/tvB"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText
        android:id="@+id/txtB"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="175dp"
        android:layout_marginTop="237dp"
        android:layout_marginEnd="26dp"
        android:layout_marginBottom="449dp"
        android:autofillHints=""
        android:ems="10"
        android:inputType="text"
        android:text="@string/txtB"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"

tools:ignore="LabelFor,SpeakableTextPresentCheck,TouchTargetSizeCheck"
/>

    <TextView
        android:id="@+id/tvRes"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="32dp"
        android:layout_marginTop="306dp"
```



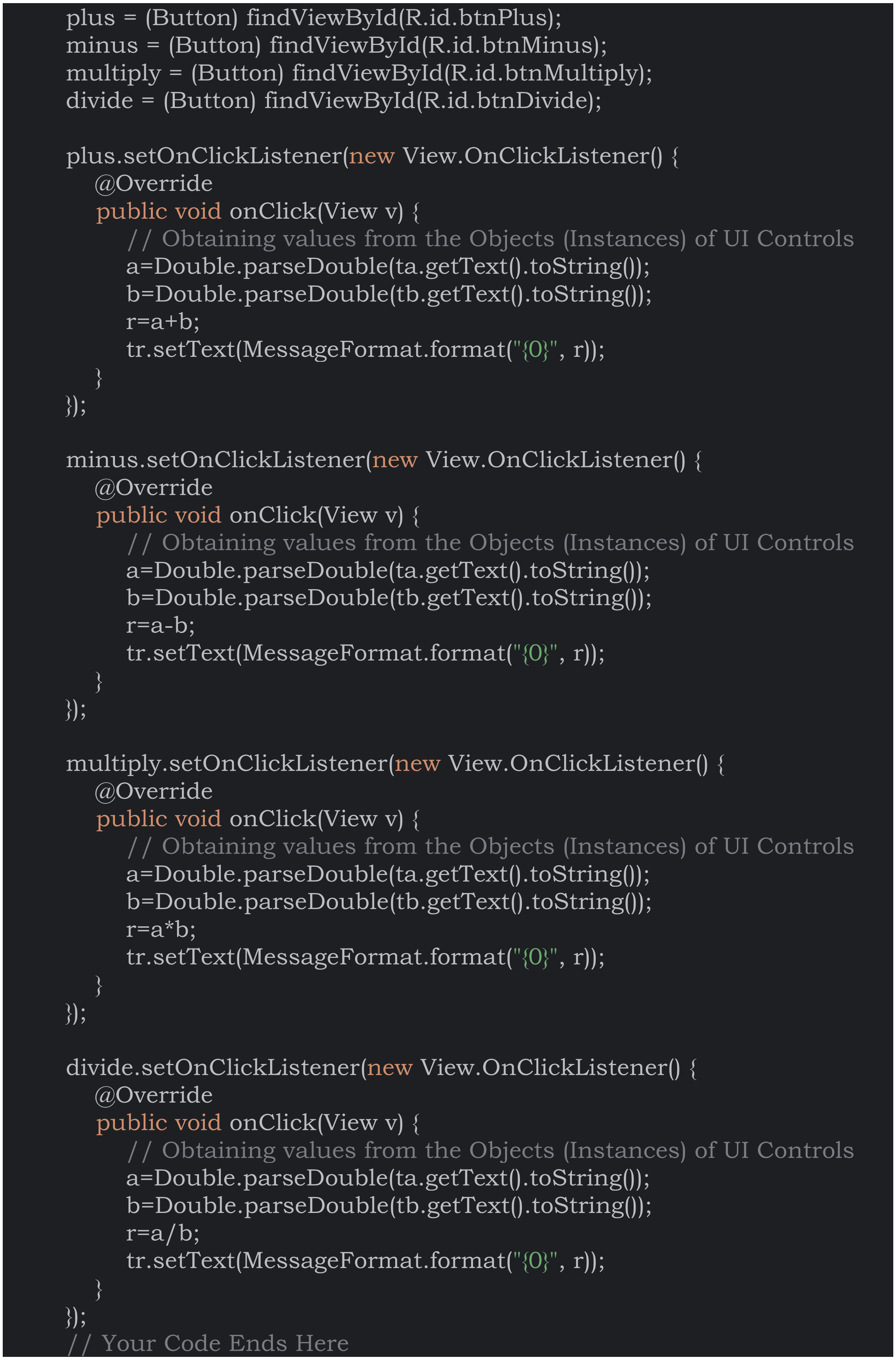
```
        android:layout_marginEnd="329dp"
        android:layout_marginBottom="401dp"
        android:text="@string/tvRes"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText
        android:id="@+id/txtRes"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="173dp"
        android:layout_marginTop="298dp"
        android:layout_marginEnd="28dp"
        android:layout_marginBottom="388dp"
        android:autofillHints=""
        android:ems="10"
        android:inputType="text"
        android:text="@string/txtRes"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"

tools:ignore="LabelFor,SpeakableTextPresentCheck,TouchTargetSizeCheck"
/>

    <Button
        android:id="@+id/btnPlus"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:layout_marginTop="370dp"
        android:layout_marginEnd="315dp"
        android:layout_marginBottom="313dp"
        android:text="@string/btnPlus"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/btnMinus"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="106dp"
        android:layout_marginTop="371dp"
        android:layout_marginEnd="217dp"
        android:layout_marginBottom="312dp"
        android:text="@string/btnMinus"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/btnMultiply"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="203dp"
        android:layout_marginTop="370dp"
        android:layout_marginEnd="120dp"
        android:layout_marginBottom="313dp"
        android:text="@string/btnMultiply"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/btnDivide"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="309dp"
        android:layout_marginTop="371dp"
        android:layout_marginEnd="14dp"
        android:layout_marginBottom="312dp"
        android:text="@string/btnDivide"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

strings.xml

```
<resources>
    <string name="app_name">SimpleArithmetic</string>
    <string name="tvTitle">Simple Arithmetic Operations</string>
    <string name="tvA">Enter value for A</string>
    <string name="txtA">""</string>
    <string name="tvB">Enter value for B</string>
    <string name="txtB">""</string>
    <string name="tvRes">Result</string>
    <string name="txtRes">""</string>
    <string name="btnPlus">+</string>
    <string name="btnMinus">-</string>
    <string name="btnMultiply">*</string>
    <string name="btnDivide">/</string>
</resources>
```

MainActivity.java

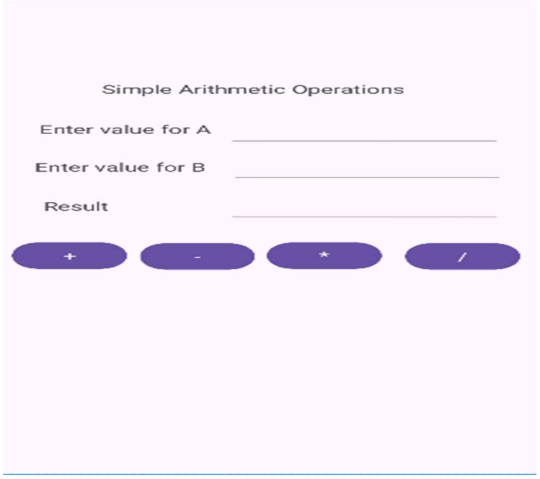
```
package com.example.simplearithmetic;

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 UI Control Classes from Packages
import android.widget.Button;
import android.widget.EditText;
import android.view.View;

import java.text.MessageFormat;

public class MainActivity extends AppCompatActivity {

    // Your Code Begins Here
    // Creating Objects (Instances) for UI Control Classes
    EditText ta,tb,tr;
    Button plus,minus,multiply,divide;
    double a,b,r;
    // Your Code Ends Here

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

        // Your Code Begins Here
        // Instantiating the objects by capturing the UI Controls from Layout
        ta = (EditText) findViewById(R.id.txtA);
        tb = (EditText) findViewById(R.id.txtB);
        tr = (EditText) findViewById(R.id.txtRes);
```



```
        plus = (Button) findViewById(R.id.btnPlus);
        minus = (Button) findViewById(R.id.btnMinus);
        multiply = (Button) findViewById(R.id.btnMultiply);
        divide = (Button) findViewById(R.id.btnDivide);

        plus.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Obtaining values from the Objects (Instances) of UI Controls
                a=Double.parseDouble(ta.getText().toString());
                b=Double.parseDouble(tb.getText().toString());
                r=a+b;
                tr.setText(MessageFormat.format("{0}", r));
            }
        });

        minus.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Obtaining values from the Objects (Instances) of UI Controls
                a=Double.parseDouble(ta.getText().toString());
                b=Double.parseDouble(tb.getText().toString());
                r=a-b;
                tr.setText(MessageFormat.format("{0}", r));
            }
        });

        multiply.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Obtaining values from the Objects (Instances) of UI Controls
                a=Double.parseDouble(ta.getText().toString());
                b=Double.parseDouble(tb.getText().toString());
                r=a*b;
                tr.setText(MessageFormat.format("{0}", r));
            }
        });

        divide.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Obtaining values from the Objects (Instances) of UI Controls
                a=Double.parseDouble(ta.getText().toString());
                b=Double.parseDouble(tb.getText().toString());
                r=a/b;
                tr.setText(MessageFormat.format("{0}", r));
            }
        });
        // Your Code Ends Here
```

```
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;
        });
    }
}
```

INPUT



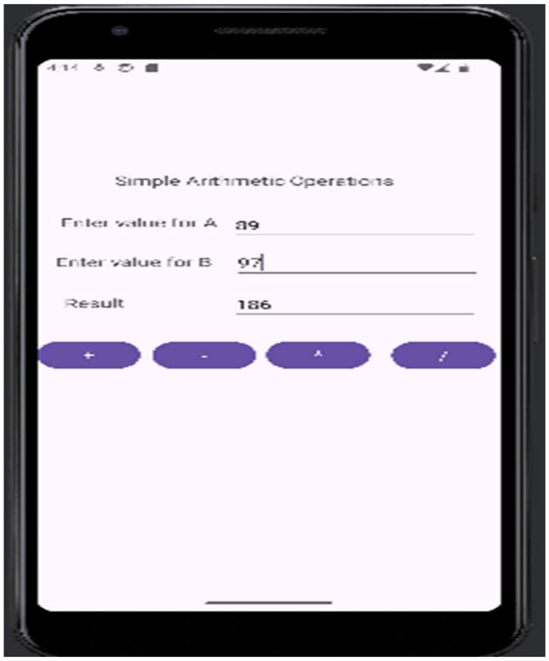
Simple Arithmetic Operations

Enter value for A

Enter value for B

Result

OUTPUT



Simple Arithmetic Operations

Enter value for A 89

Enter value for B 97

Result 186

5. Develop an Android application using popup menus (i) to find HCF (Highest Common Factor) and (ii) to find LCM (Least Common Multiple) for the two numbers given as input through EditText controls and use Toast control to display the output.

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/tvTitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="65dp"
        android:layout_marginTop="105dp"
        android:layout_marginEnd="66dp"
        android:layout_marginBottom="581dp"
        android:text="Find HCF and LCM"

android:textAppearance="@style/TextAppearance.AppCompat.Display1"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <TextView
        android:id="@+id/tvA"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="23dp"
        android:layout_marginTop="185dp"
        android:layout_marginEnd="256dp"
        android:layout_marginBottom="522dp"
        android:text="Enter value for A"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <TextView
        android:id="@+id/tvB"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="23dp"
        android:layout_marginTop="250dp"
        android:layout_marginEnd="255dp"
        android:layout_marginBottom="457dp"
        android:text="Enter Value for B"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText,VisualLintOverlap" />

    <EditText
        android:id="@+id/txtA"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="186dp"
        android:layout_marginTop="178dp"
        android:layout_marginEnd="15dp"
        android:layout_marginBottom="508dp"
        android:ems="10"
        android:inputType="text"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"

tools:ignore="Autofill,LabelFor,SpeakableTextPresentCheck,TouchTargetSize
Check,VisualLintOverlap" />

    <EditText
        android:id="@+id/txtB"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="183dp"
        android:layout_marginTop="239dp"
```

```
        android:layout_marginEnd="18dp"
        android:layout_marginBottom="447dp"
        android:ems="10"
        android:inputType="text"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"

tools:ignore="Autofill,LabelFor,SpeakableTextPresentCheck,TouchTargetSize
Check" />

    <Button
        android:id="@+id/btnShowPopupMenu"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="89dp"
        android:layout_marginTop="306dp"
        android:layout_marginEnd="89dp"
        android:layout_marginBottom="375dp"
        android:text="Show Popup Menu"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

mypopup_menu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:android="http://schemas.android.com/apk/res/android">

    <item
        android:id="@+id/mnuHCF"
        android:title="@string/mnuItem1" />
    <item
        android:id="@+id/mnuLCM"
        android:title="@string/mnuItem2" />
</menu>
```

stings.xml

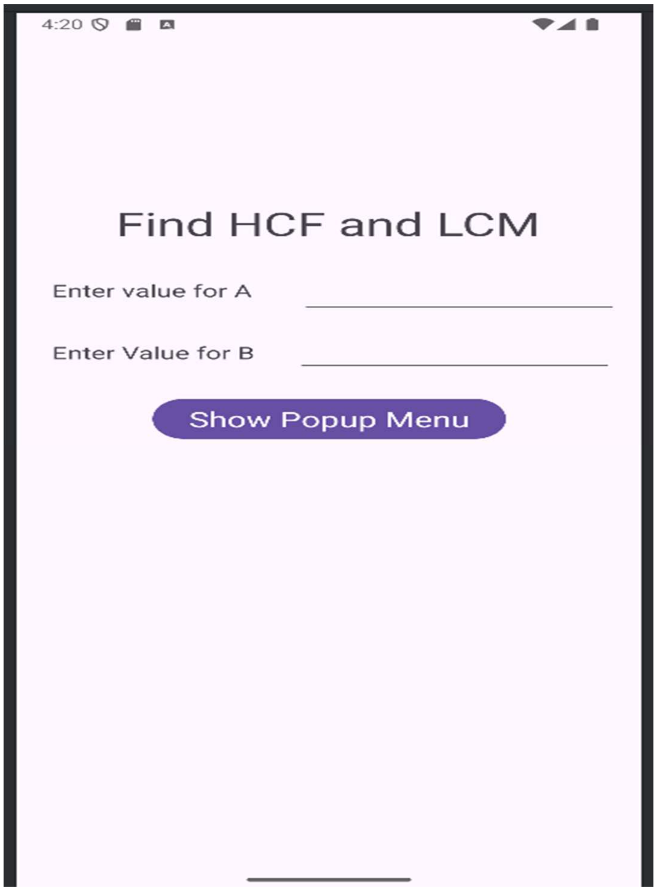
```
<resources>
   <string name="app_name">HCFLCM</string>
   <string name="mnuItem1">Find HCF</string>
   <string name="mnuItem2">Find LCM</string>
</resources>
```

MainActivity.java

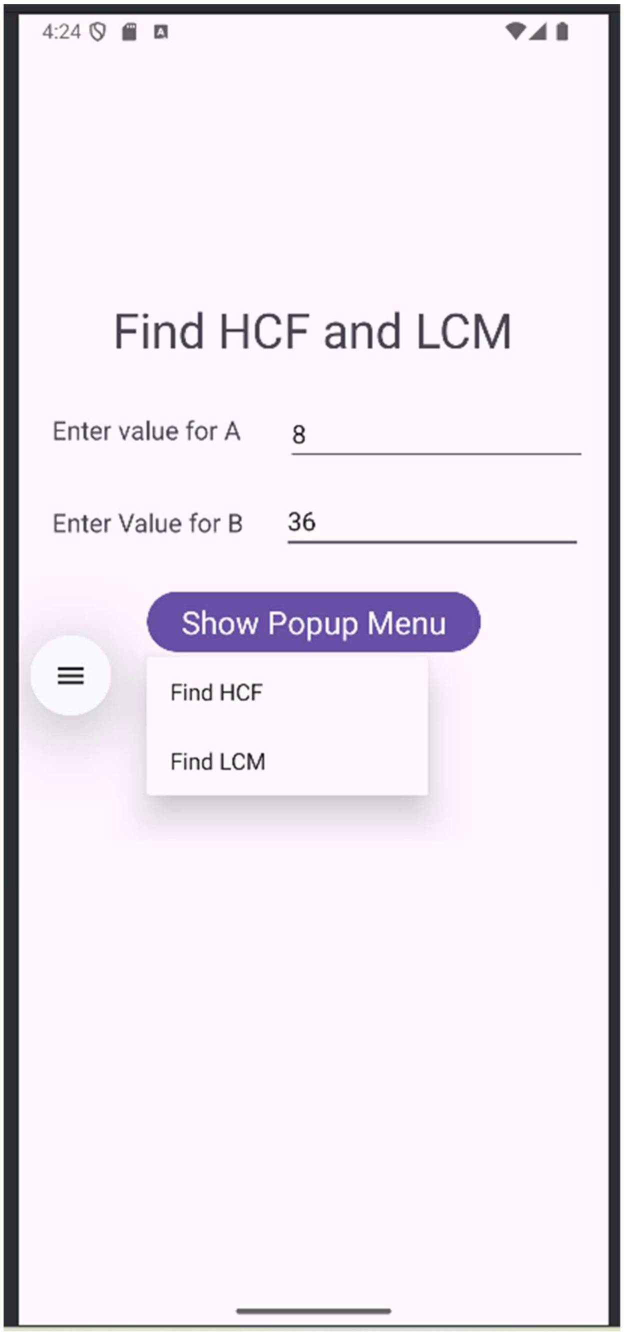
```
package com.example.hcflcm;

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;

// Step 1: Import UI Control classes from Packages
import android.widget.Button;
import android.widget.PopupMenu;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

   // Your Code Begins Here
   // Step 2: Create instances (Objects) for UI Control Classes
   // and Declare variables and constants if required for this application
   Button btnShowPopup;
   EditText ta,tb;
   String option;
   int a,b,hcf,lcm;
   // Your Code Ends Here

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      EdgeToEdge.enable(this);
      setContentView(R.layout.activity_main);

      // Your Code Begins Here
```

```
        // Step 3: Instantiate the Button Object and
        // EditText Objects
        btnShowPopup= findViewById(R.id.btnShowPopupMenu);
        ta= findViewById(R.id.txtA);
        tb= findViewById(R.id.txtB);

        // Step 4: Add or Set listener to the Button
        btnShowPopup.setOnClickListener(v -> {
            // Step 5: Creating and instantiating
            // the instance of PopupMenu
            PopupMenu popup = new PopupMenu(MainActivity.this,
btnShowPopup);
            //Step 6: Inflating the Popup using xml file
            popup.getMenuInflater().inflate(R.menu.mypopup_menu,
popup.getMenu());
            //Step 7: Registering popup with OnMenuItemClickListener
           popup.setOnMenuItemClickListener(item -> {
               a=Integer.parseInt(ta.getText().toString());
               b=Integer.parseInt(tb.getText().toString());
               option = (String) item.getTitle();
               if (option != null && option.equalsIgnoreCase("Find HCF")) {
                   hcf = findHCF(a,b);
                   Toast.makeText(MainActivity.this,"HCF is " + hcf,
Toast.LENGTH_SHORT).show();
               }
               assert option != null;
               if (option.equalsIgnoreCase("Find LCM")) {
                   lcm = findLCM(a,b,hcf);
                   Toast.makeText(MainActivity.this,"LCM is " + lcm,
Toast.LENGTH_SHORT).show();
               }
               return false;
           });
            //Step 8: Showing popup menu
            popup.show();
        }); // Closing the setOnClickListener method
        // Your Code Ends Here

        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;
        });
    }

    // Your Code Begins Here
    // Step 9: Define findHCF() and findLCM()
    public static int findHCF(int a, int b)
    {
        if(a==0)
            return b;
        else
            return findHCF(b%a,a);
    }
    public static int findLCM(int a, int b, int hcf)
    {
        return (a*b)/hcf;
    }
    // Your Code Ends Here
}
```

INPUT



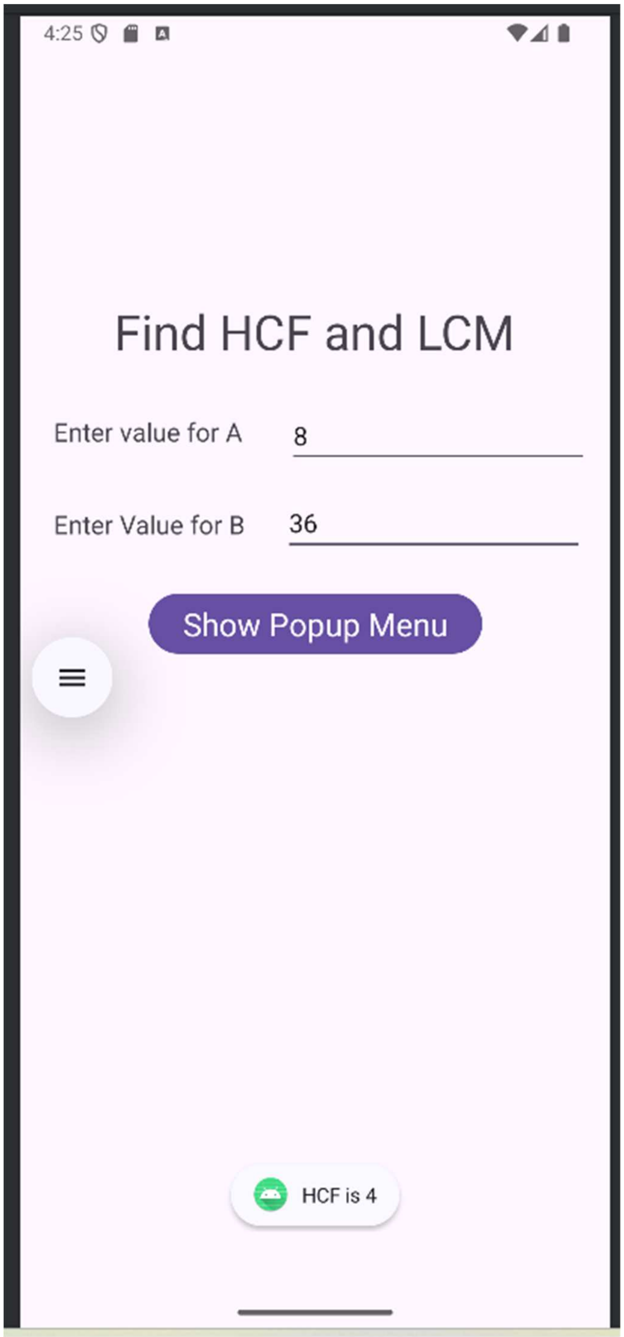
OUTPUT



Find HCF and LCM

Enter value for A 8

Enter Value for B 36

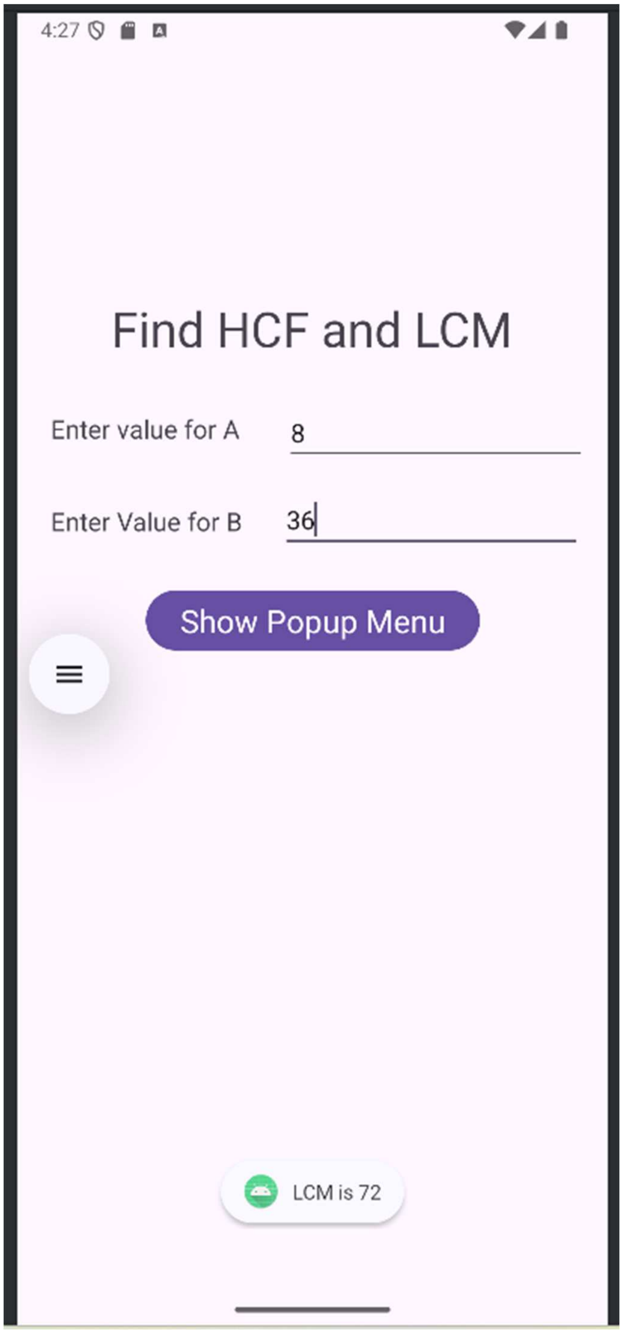


Find HCF and LCM

Enter value for A 8

Enter Value for B 36

HCF is 4



4:27

Find HCF and LCM

Enter value for A 8

Enter Value for B 36

LCM is 72

6. Develop an Android application using options menu (i) to compute factorial value and (ii) to generate Fibonacci series of a number given as input using an EditText control and use Toast control to display the output.

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">

    <androidx.appcompat.widget.Toolbar
        android:id="@+id/toolbar"
        android:layout_width="409dp"
        android:layout_height="wrap_content"
        android:layout_marginStart="1dp"
        android:layout_marginEnd="1dp"
        android:layout_marginBottom="667dp"
        android:background="?attr/colorPrimary"
        android:minHeight="?attr/actionBarSize"
        android:theme="?attr/actionBarTheme"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/tvTitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="28dp"
        android:layout_marginTop="118dp"
        android:layout_marginEnd="28dp"
        android:layout_marginBottom="583dp"
        android:text="Factorial Value and Fibonacci Series"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <TextView
        android:id="@+id/tvNumber"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="19dp"
        android:layout_marginTop="177dp"
        android:layout_marginEnd="270dp"
        android:layout_marginBottom="530dp"
        android:text="Enter a number"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <EditText
        android:id="@+id/txtNumber"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="173dp"
        android:layout_marginTop="165dp"
        android:layout_marginEnd="28dp"
        android:layout_marginBottom="521dp"
        android:ems="10"
        android:inputType="text"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"

tools:ignore="Autofill,LabelFor,SpeakableTextPresentCheck,TextFields,Touch
TargetSizeCheck" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

myoptions_menu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:android="http://schemas.android.com/apk/res/android">

    <item
        android:id="@+id/mnuFact"
        android:title="@string/mnuFact" />
    <item
        android:id="@+id/mnuFibo"
        android:title="@string/mnuFibo" />
</menu>
```

stings.xml

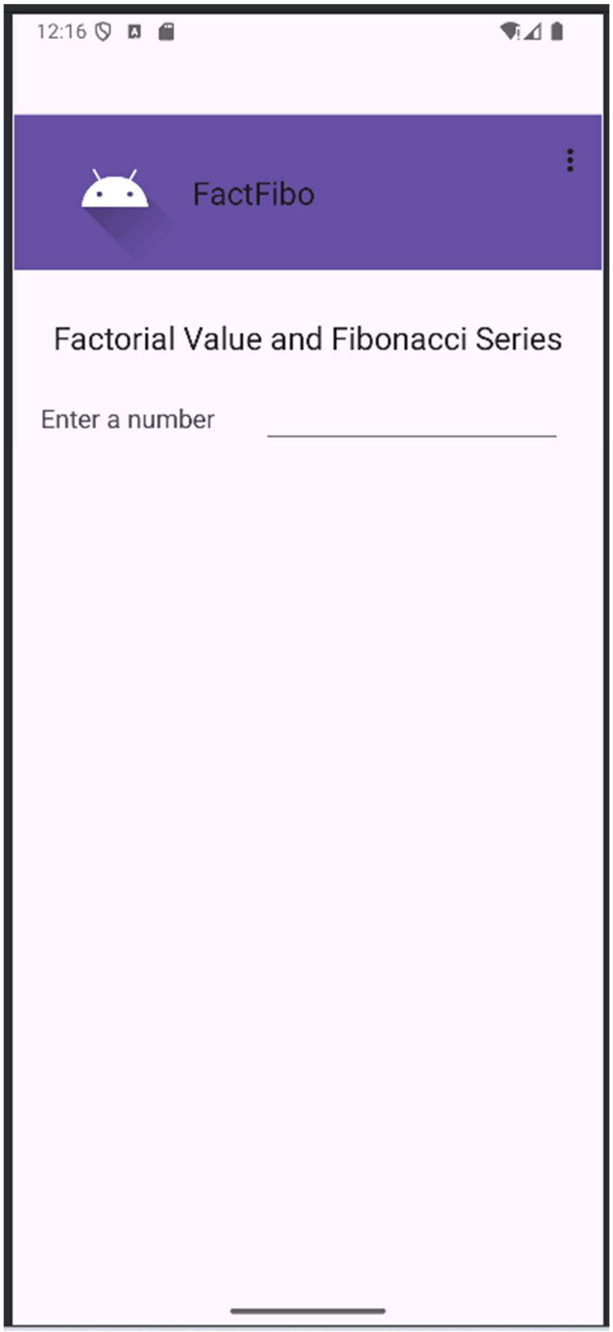
```xml
<resources>
   <string name="app_name">FactFibo</string>
   <string name="mnuFact">Compute Factorial Value</string>
   <string name="mnuFibo">Generate Fibonacci Series</string>
</resources>
```

MainActivity.java

```java
package com.example.factfibo;

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;

// Your Code Begins Here
// Step 1: Import UI Control Classes from Packages
import android.view.Menu;
import android.view.MenuItem;
import android.view.MenuInflater;
import android.widget.EditText;
import android.widget.Toast;
import androidx.appcompat.widget.Toolbar;

import java.util.Objects;
// Your Code Ends Here

public class MainActivity extends AppCompatActivity {

   // Step 2: Create instances for UI Control Classes and
   // Declare variables and constants if required for the application
   EditText txtNumber;
   Toolbar toolbar;
   long n,fact,fibo;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      EdgeToEdge.enable(this);
      setContentView(R.layout.activity_main);

      // Your Code Begins Here
      // Step 3: Create an instance for Toolbar and Instantiate it
      // (by assigning ID of the toolbar to a variable)
```

```
        toolbar = findViewById(R.id.toolbar);
        // Set the toolbar object as an Action Bar
        // (using toolbar as ActionBar)
        setSupportActionBar(toolbar);
        // Instantiate EditText object
        txtNumber=findViewById(R.id.txtNumber);

        // Step 4: Display application icon in the toolbar

Objects.requireNonNull(getSupportActionBar()).setDisplayShowHomeEnabled
(true);
        getSupportActionBar().setLogo(R.drawable.ic_launcher_foreground);
        getSupportActionBar().setDisplayUseLogoEnabled(true);
        // Your Code Ends Here

        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;
        });
    }

    // Your Code Begins Here
    // Step 5: Create a method to show the menu in the toolbar
    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        MenuInflater inflater = getMenuInflater();
        inflater.inflate(R.menu.myoptions_menu, menu);
        return super.onCreateOptionsMenu(menu);
    }

    // Step 6: Perform actions for the selected item from the toolbar menu
    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        if (item.getItemId()==R.id.mnuFact) {
            // Obtain value from EditText object
            n=Long.parseLong(txtNumber.getText().toString());
            // Compute factorial value
            fact=findFact(n);
            Toast.makeText(getApplicationContext(), "Factorial value is " + fact,
Toast.LENGTH_LONG).show();
        }
        if (item.getItemId()==R.id.mnuFibo) {
            String res="";
            for (int i=1;i<=n;i++){
                fibo=genFibo(i);
                res = res.concat(String.valueOf(fibo));
                if (i!=n)
                    res = res.concat(",");
            }
            Toast.makeText(getApplicationContext(), "Fibonacci series are: " +
res, Toast.LENGTH_LONG).show();
        }
        return super.onOptionsItemSelected(item);
    }

    // Step 7: Define functions for Computing Factorial values
    // and Generating Fibonacci Series
    public static long findFact(long num)
    {
        if (num >= 1)
            return num * findFact(num - 1);
        else
            return 1;
    }
    public static long genFibo(long num)
    {
        if (num == 1)
            return(0);
        else if (num == 2)
            return(1);
        else
            return(genFibo(num-1)+genFibo(num-2));
    }
    // Your Code Ends Here

}
```

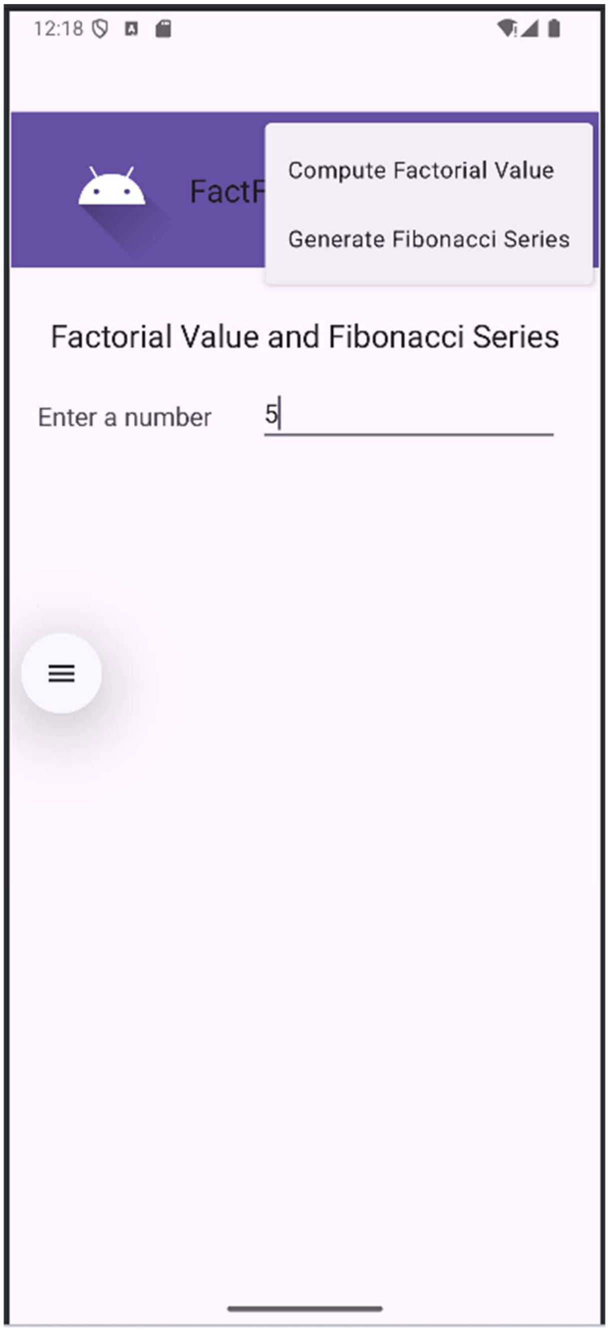
INPUT



Factorial Value and Fibonacci Series

Enter a number

OUTPUT

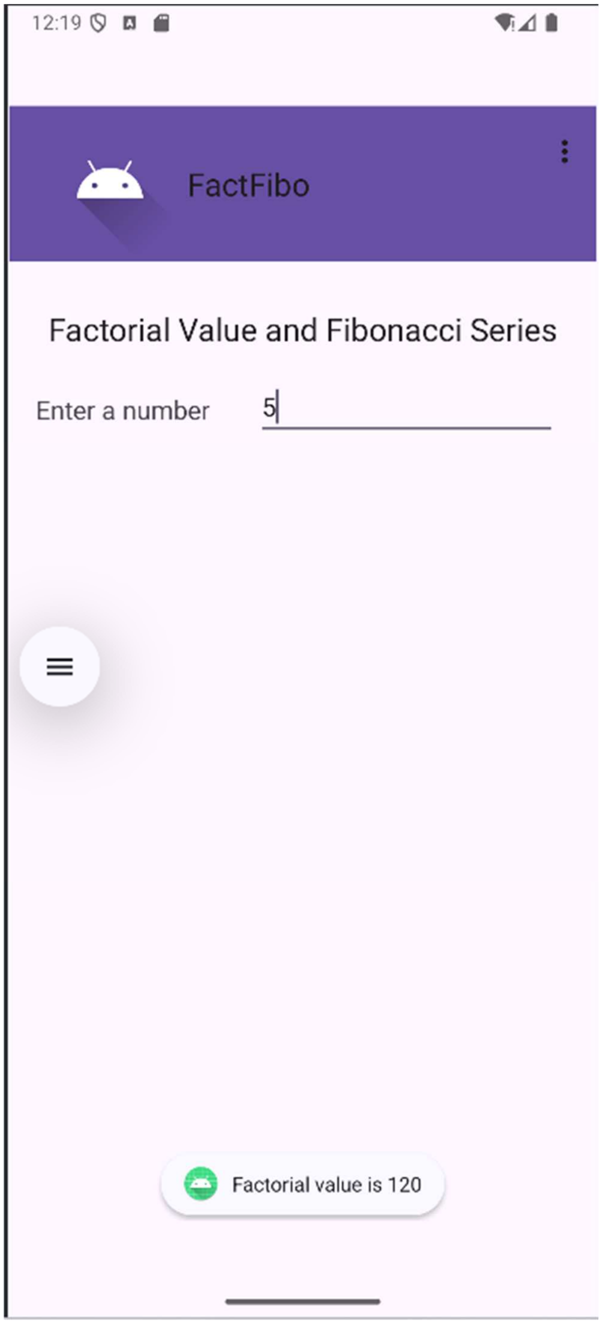


Compute Factorial Value

Generate Fibonacci Series

Factorial Value and Fibonacci Series

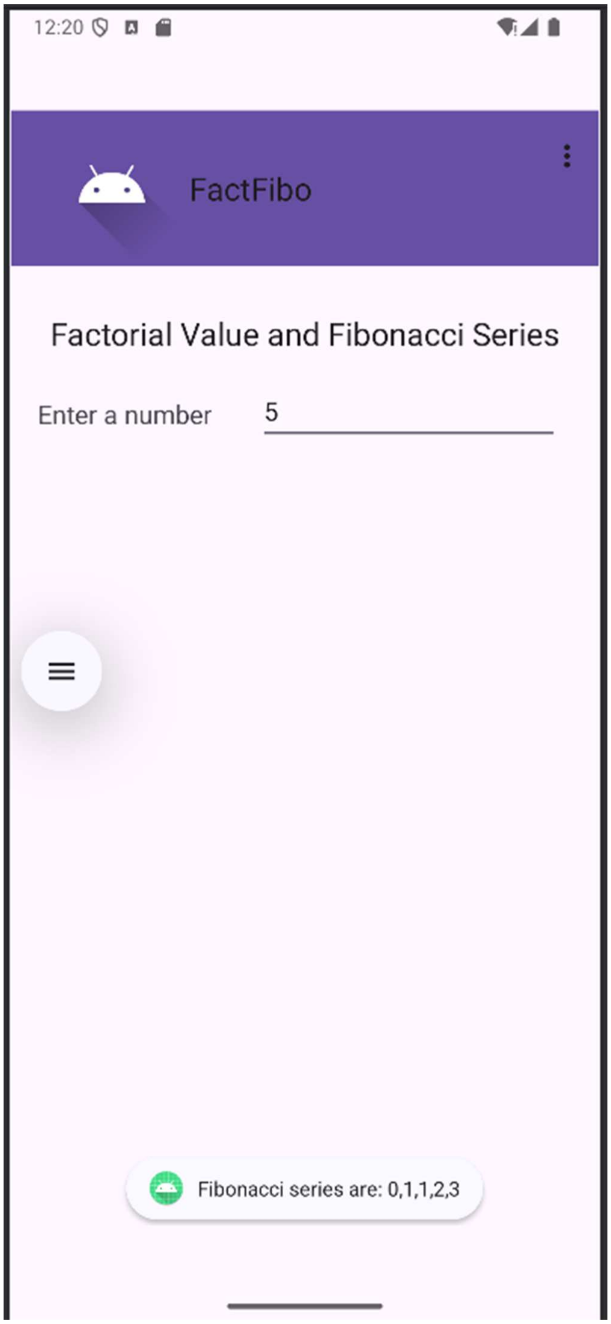
Enter a number 5



Factorial Value and Fibonacci Series

Enter a number 5

Factorial value is 120



FactFibo

Factorial Value and Fibonacci Series

Enter a number 5

Fibonacci series are: 0,1,1,2,3

7. Develop an Android application using Java to get your name and date of birth as input and display your age in years, months, and days.

activity_main.xml

8. Develop an Android application using Java to perform Database manipulation on any SQLite Database table.

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/tvTitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="36dp"
        android:layout_marginTop="58dp"
        android:layout_marginEnd="16dp"
        android:layout_marginBottom="643dp"
        android:text="Database Manipulation Using SQLite"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <TextView
        android:id="@+id/tvStudentRNo"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="36dp"
        android:layout_marginTop="124dp"
        android:layout_marginEnd="241dp"
        android:layout_marginBottom="583dp"
        android:text="Register Number"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <EditText
        android:id="@+id/txtStudentRNo"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="186dp"
        android:layout_marginTop="114dp"
        android:layout_marginEnd="15dp"
        android:layout_marginBottom="572dp"
        android:ems="10"
        android:inputType="text"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"

tools:ignore="Autofill,LabelFor,SpeakableTextPresentCheck,TouchTargetSize
Check" />

    <TextView
        android:id="@+id/tvName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="36dp"
        android:layout_marginTop="189dp"
        android:layout_marginEnd="261dp"
        android:layout_marginBottom="518dp"
        android:text="Student Name"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <EditText
        android:id="@+id/txtStudentName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="184dp"
        android:layout_marginTop="179dp"
        android:layout_marginEnd="17dp"
        android:layout_marginBottom="507dp"
        android:ems="10"
        android:inputType="text"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"

tools:ignore="Autofill,LabelFor,SpeakableTextPresentCheck,TouchTargetSize
Check" />

    <Button
        android:id="@+id/btnInsert"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="28dp"
        android:layout_marginTop="250dp"
        android:layout_marginEnd="261dp"
        android:layout_marginBottom="431dp"
        android:text="INSERT"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <Button
        android:id="@+id/btnView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="164dp"
        android:layout_marginTop="250dp"
        android:layout_marginEnd="147dp"
        android:layout_marginBottom="431dp"
        android:text="VIEW"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <Button
        android:id="@+id/btnClose"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="279dp"
        android:layout_marginTop="250dp"
        android:layout_marginEnd="17dp"
        android:layout_marginBottom="431dp"
        android:text="CLOSE"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <Button
        android:id="@+id/btnUpdate"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="29dp"
        android:layout_marginTop="326dp"
        android:layout_marginEnd="252dp"
        android:layout_marginBottom="355dp"
        android:text="UPDATE"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <Button
        android:id="@+id/btnDelete"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="168dp"
        android:layout_marginTop="323dp"
        android:layout_marginEnd="117dp"
        android:layout_marginBottom="358dp"
        android:text="DELETE"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />

    <Button
        android:id="@+id/btnClear"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="294dp"
        android:layout_marginTop="323dp"
        android:layout_marginEnd="2dp"
        android:layout_marginBottom="358dp"
```

```
        android:text="CLEAR"
        android:textAppearance="@style/TextAppearance.AppCompat.Large"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:ignore="HardcodedText" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

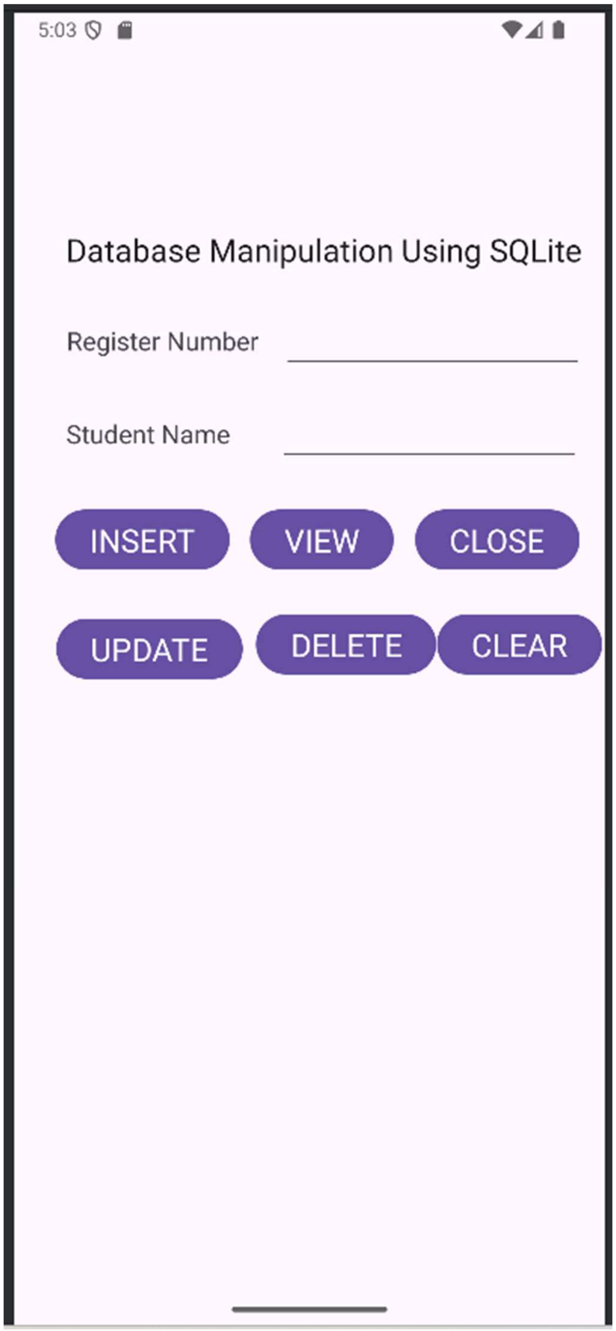
MainActivity.java

```
package com.example.mydatabaseapp;

import android.annotation.SuppressLint;
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;

// Your code begins here
// Step 1: Import UI classes from Android API for Database Operations
import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;

import android.widget.EditText;
import android.widget.Button;
import android.widget.Toast;
// Your code ends here

public class MainActivity extends AppCompatActivity {

    // Your code begins here
    // Step 2: Create instances of UI classes and define variables and
constants
    // if required for the application
    // creating variables for our edittext, button and dbhandler
    private EditText txtRegno, txtName;
    private Button btnInsert, btnUpdate, btnDelete, btnView, btnClose,
btnClear;
    private DBHandler dbHandler;
    String rno, name;
    int nr;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

        // Your code begins here
        // Step 3: Instantiating the UI objects, variables and constants
        // initializing all our variables.
        txtRegno=findViewById(R.id.txtStudentRNo);
        txtName=findViewById(R.id.txtStudentName);
        btnInsert=findViewById(R.id.btnInsert);
        btnUpdate=findViewById(R.id.btnUpdate);
        btnDelete=findViewById(R.id.btnDelete);
        btnView=findViewById(R.id.btnView);
        btnClose=findViewById(R.id.btnClose);
        btnClear=findViewById(R.id.btnClear);

        // creating a new dbhandler class
        // and passing our context to it.
        dbHandler = new DBHandler(MainActivity.this);

        // Inserting a record into a Database Table
        btnInsert.setOnClickListener(view -> {
            // below line is to get data from all edit text fields.
            rno = txtRegno.getText().toString();
            name = txtName.getText().toString();
            // validating if the text fields are empty or not.
            if (rno.isEmpty() && name.isEmpty()) {
                Toast.makeText(MainActivity.this, "Please enter all the data..",
Toast.LENGTH_SHORT).show();
                return;
            }

            // on below line we are calling a method to add new
            // course to sqlite data and pass all our values to it.
            dbHandler.addNewRecord(rno, name);

            // after adding the data we are displaying a toast message.
            Toast.makeText(MainActivity.this, "Student record has been added.",
Toast.LENGTH_SHORT).show();
            clearTextFields();
        });

        // Updating an existing record into a Database table
        btnUpdate.setOnClickListener(view -> {
            // below line is to get data from all edit text fields.
            rno = txtRegno.getText().toString();
            name = txtName.getText().toString();
            // validating if the text fields are empty or not
            if (rno.isEmpty() && name.isEmpty()) {
                Toast.makeText(MainActivity.this, "Please enter all the data..",
Toast.LENGTH_SHORT).show();
            } else {
                nr = dbHandler.updateRecord(rno, name);
                if (nr>0)
                    Toast.makeText(MainActivity.this, "Details of "+rno+" updated
successfully", Toast.LENGTH_LONG).show();
                else
                    Toast.makeText(MainActivity.this, rno+" is not found in the
database table", Toast.LENGTH_LONG).show();
            }
        });

        // Deleting an existing record from a Database table
        btnDelete.setOnClickListener(view -> {
            rno = txtRegno.getText().toString();
            if (!rno.isEmpty()) {
                int nr=dbHandler.deleteRecord(rno);
                if (nr>0)
                    Toast.makeText(MainActivity.this, rno+" deleted from the
database table", Toast.LENGTH_LONG).show();
                else
                    Toast.makeText(MainActivity.this, rno+" is not found in the
database table", Toast.LENGTH_LONG).show();
                clearTextFields();
            }
            if (rno.equalsIgnoreCase(""))
                Toast.makeText(MainActivity.this, "Please enter the register
number of a student!", Toast.LENGTH_LONG).show();
        });

        // Displaying a specific record from a database table
        btnView.setOnClickListener(view -> {
            rno = txtRegno.getText().toString();
            StudentRecord rec;
            if (!rno.isEmpty())
            {
                rec = dbHandler.viewRecord(rno);
                if (rec!=null)
                {
                    txtName.setText(rec.getName());
                    if (!txtName.getText().toString().equalsIgnoreCase(""))
                        Toast.makeText(MainActivity.this, "REGNO:
"+rec.getRegno()+" & NAME: "+rec.getName(), Toast.LENGTH_LONG).show();
                    else {
                        Toast.makeText(MainActivity.this, rno + " is not found in the
database table", Toast.LENGTH_LONG).show();
                        clearTextFields();
                    }
                }
            }
            if (rno.equalsIgnoreCase(""))
                Toast.makeText(MainActivity.this, "Please enter the register
number of a student!", Toast.LENGTH_LONG).show();
        });

        // Closing a database if no longer required for database manipulation
        btnClose.setOnClickListener(view -> {
            dbHandler.closeDB();
            Toast.makeText(MainActivity.this, "Student Database Closed",
Toast.LENGTH_SHORT).show();
        });

        btnClear.setOnClickListener(view -> clearTextFields());
        // Your code ends here

        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 clearTextFields()
    {
        txtRegno.setText("");
        txtName.setText("");
    }
}

class DBHandler extends SQLiteOpenHelper {

    // creating a constant variables for our database.
    // below variable is for our database name.
    static final String DB_NAME = "studentdb";

    // below int is our database version
    static final int DB_VERSION = 1;

    // below variable is for our table name.
    static final String TABLE_NAME = "student";

    // below variable is for our id column.
```

```
static final String ID_COL = "regno";

// below variable is for our course name column
static final String NAME_COL = "name";

SQLiteDatabase db;

Cursor c;
int nr;
StudentRecord rec;

// creating a constructor for our database handler.
public DBHandler(Context context) {
    super(context, DB_NAME, null, DB_VERSION);
}

// below method is for creating a database by running a sqlite query
@Override
public void onCreate(SQLiteDatabase db) {
    // on below line we are creating
    // an sqlite query and we are
    // setting our column names
    // along with their data types.
    String query = "CREATE TABLE " + TABLE_NAME + " ("
            + ID_COL + " TEXT PRIMARY KEY, "
            + NAME_COL + " TEXT )";

    // at last we are calling a exec sql
    // method to execute above sql query
    db.execSQL(query);
}

// this method is use to add new course to our sqlite database.
public void addNewRecord(String regno, String name) {

    // on below line we are creating a variable for
    // our sqlite database and calling writable method
    // as we are writing data in our database.
    db = this.getWritableDatabase();

    // on below line we are creating a
    // variable for content values.
    ContentValues values = new ContentValues();

    // on below line we are passing all values
    // along with its key and value pair.
    values.put(ID_COL, regno);
    values.put(NAME_COL, name);
```

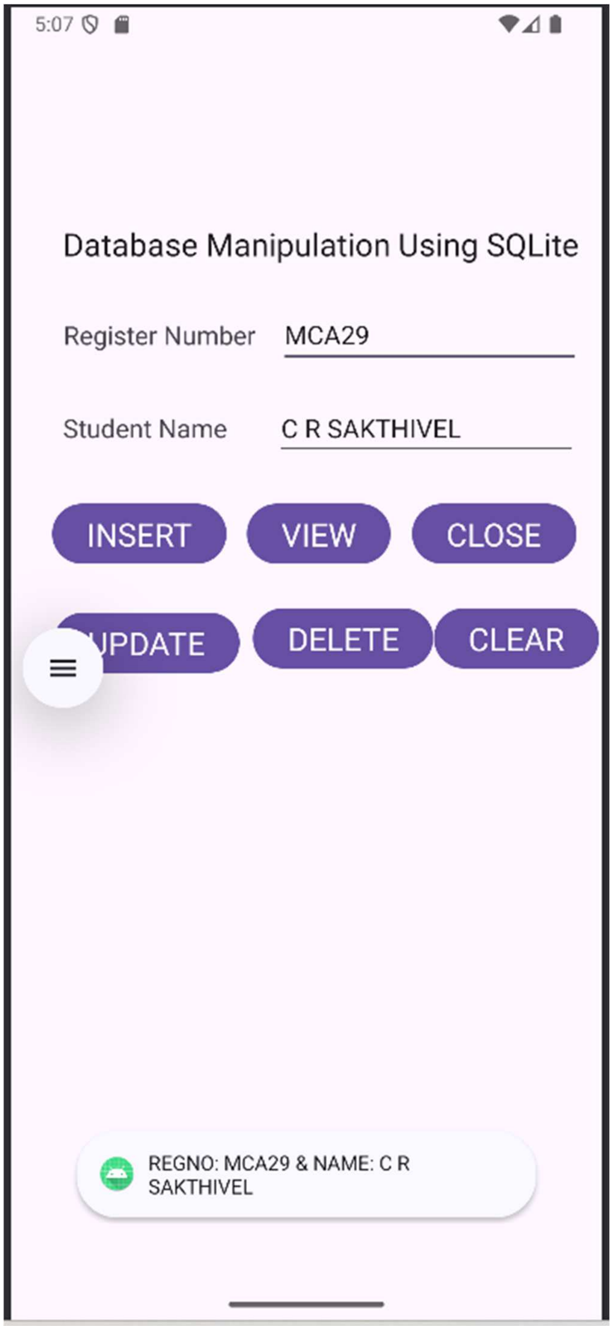
```
        // after adding all values we are passing
        // content values to our table.
        db.insert(TABLE_NAME, null, values);
    }

    public int updateRecord(String rno, String name)
    {
        // calling a method to get writable database.
        db = this.getWritableDatabase();
        ContentValues values = new ContentValues();
        // on below line we are passing all values
        // along with its key and value pair.
        values.put(NAME_COL, name);
        // on below line we are calling a update method to update our
database and passing our values.
        // and we are comparing it with name of our course which is stored in
original name variable.
        nr=db.update(TABLE_NAME, values, ID_COL + "=?", new String[]{ rno });
        return (nr);
    }

    public int deleteRecord(String rno)
    {
        // Calling getWritableDatabase() on SQLite for
        // performing database manipulation
        db = this.getWritableDatabase();
        // Deleting an existing record
        nr=db.delete(TABLE_NAME,ID_COL + "=?",new String[] { rno });
        return(nr);
    }

    @SuppressLint("Range")
    public StudentRecord viewRecord(String rno)
    {
        // on below line we are creating a
        // database for reading our database.
        db = this.getReadableDatabase();

        try {
            // on below line we are creating a cursor with query to read data
from database
            c = db.query(TABLE_NAME,new String[] { ID_COL, NAME_COL
},ID_COL + "=?",
                    new String[] { rno },null, null, null, null);
            //if (c!=null) {
                c.moveToFirst();
                //rec=new StudentRecord(c.getString(0), c.getString(1));
                rec=new StudentRecord();
                rec.setRegno(c.getString(0));
                rec.setName(c.getString(1));
            //}
        }catch(Exception e){e.printStackTrace();}
        return rec;
    }

    public void closeDB()
    {
        // Closing database after the database manipulation
        db.close();
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int
newVersion) {
        // This method is called to check if the table exists already
        db.execSQL("DROP TABLE IF EXISTS " + TABLE_NAME);
        onCreate(db);
    }
}

class StudentRecord {
    String regno;
    String name;

    StudentRecord()
    {}

    /**
    StudentRecord(String regno,String name)
    {
        this.regno=regno;
        this.name=name;
    }
    */

    void setRegno(String regno)
    {
        this.regno=regno;
    }
    String getRegno()
    {
        return regno;
    }

    void setName(String name)
    {
        this.name=name;
    }
    String getName() {
        return name;
    }
}
```

INPUT



OUTPUT

View Operation



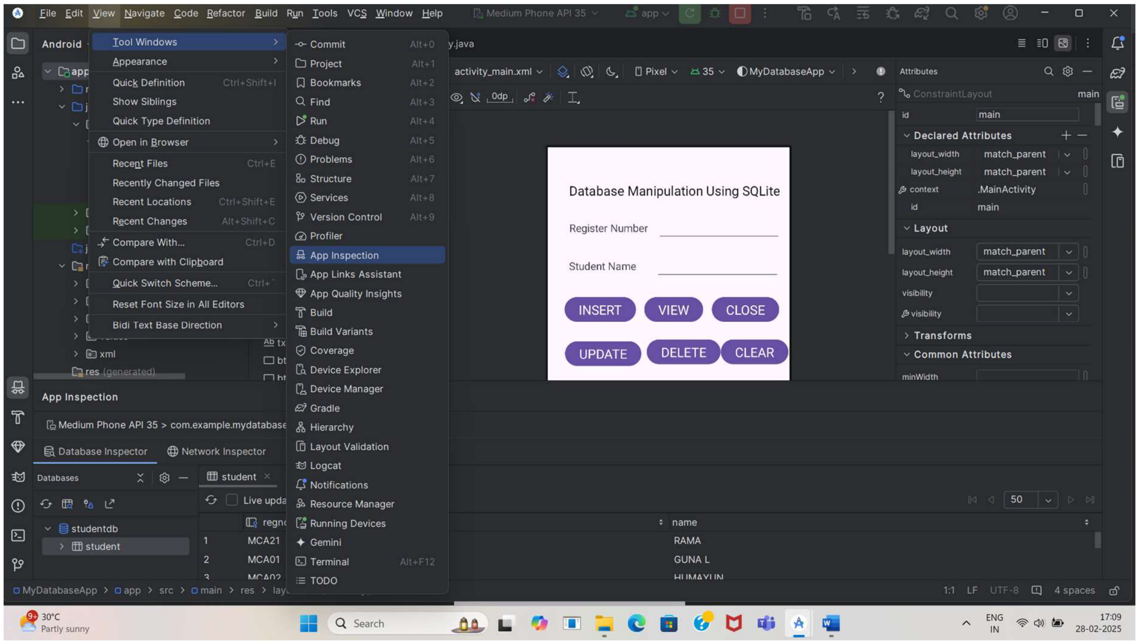
5:07

Database Manipulation Using SQLite

Register Number MCA29

Student Name C R SAKTHIVEL

REGNO: MCA29 & NAME: C R SAKTHIVEL



Database Manipulation Using SQLite

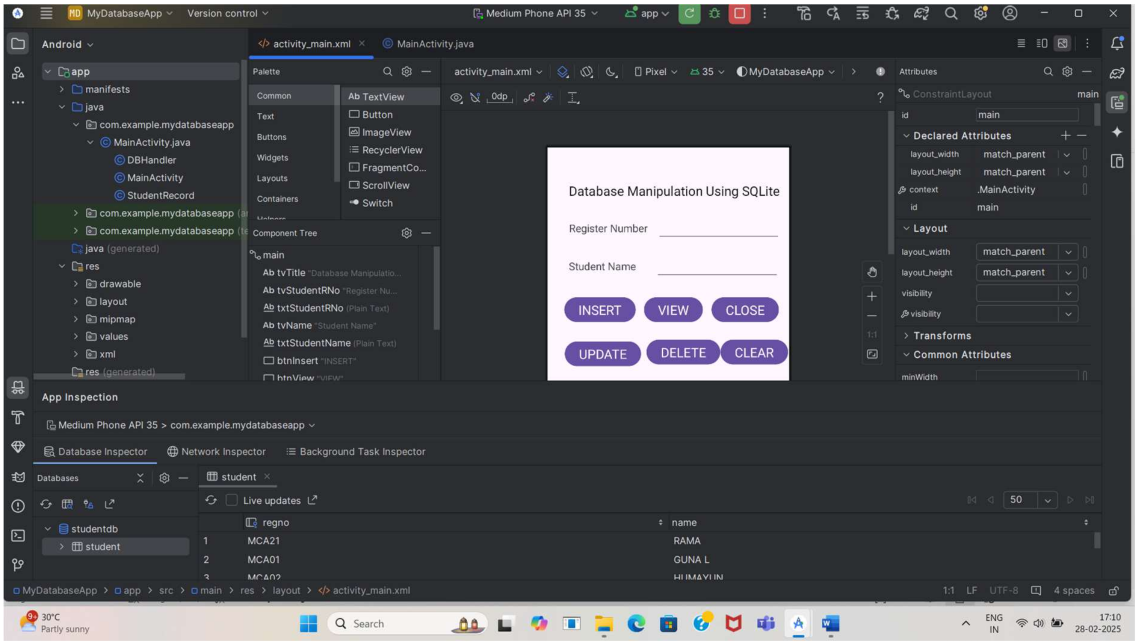
Register Number

Student Name

INSERT VIEW CLOSE

UPDATE DELETE CLEAR

	regno	name
1	MCA21	RAMA
2	MCA01	GUNA L
3	MCA02	HUMAYUN



Database Manipulation Using SQLite

Register Number

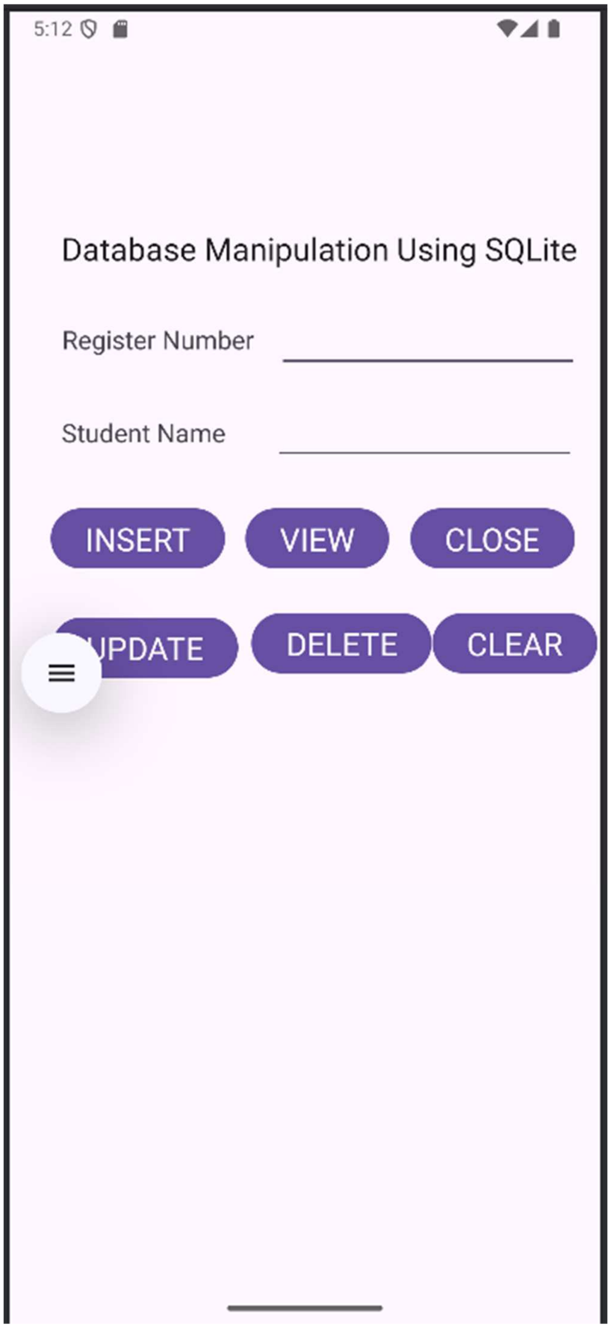
Student Name

INSERT VIEW CLOSE

UPDATE DELETE CLEAR

	regno	name
1	MCA21	RAMA
2	MCA01	GUNA L
3	MCA02	HUMAYUN

Clearing Text Fields

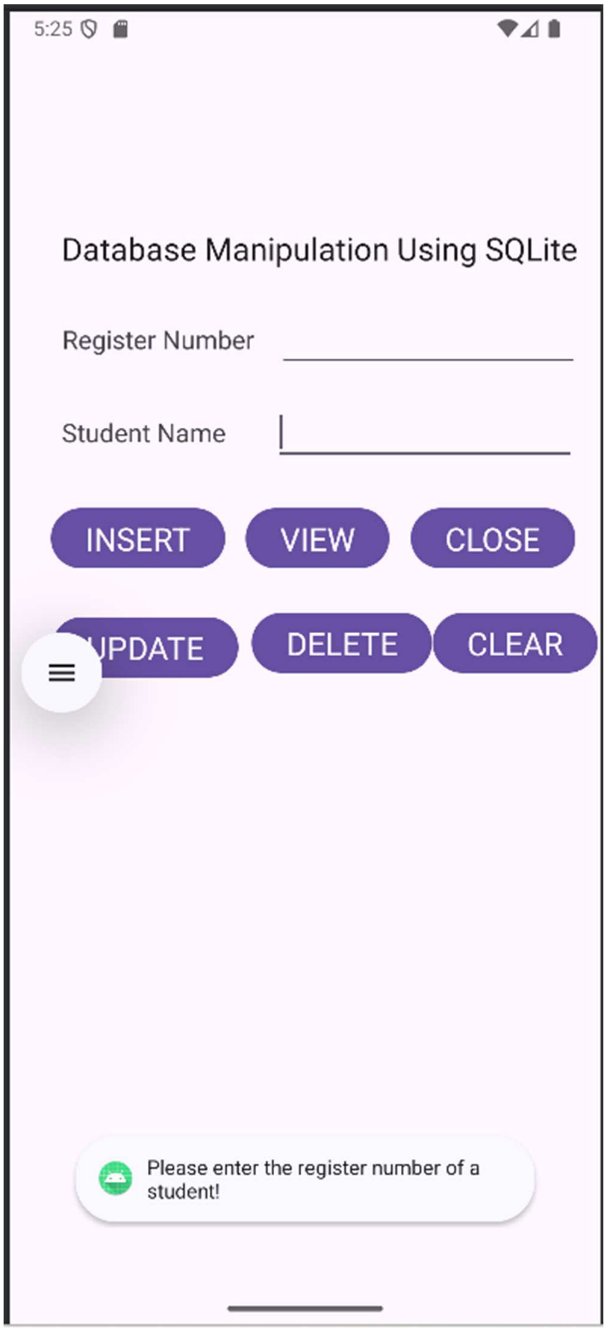


Database Manipulation Using SQLite

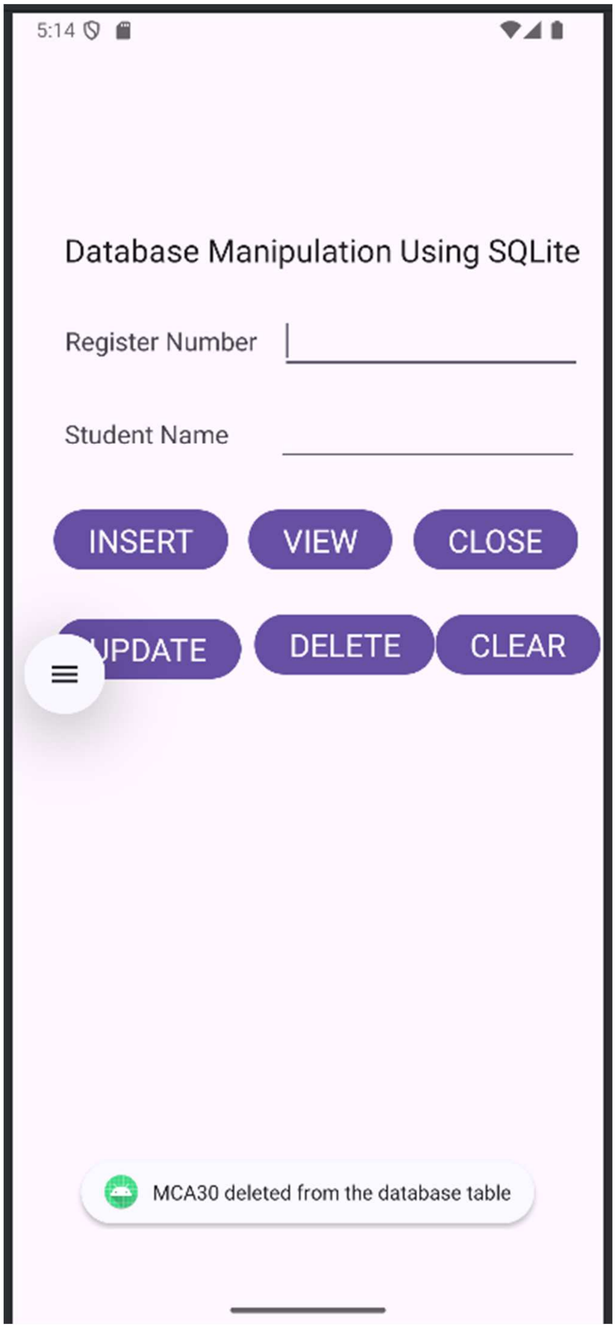
Register Number

Student Name

Delete Operation



Please enter the register number of a student!



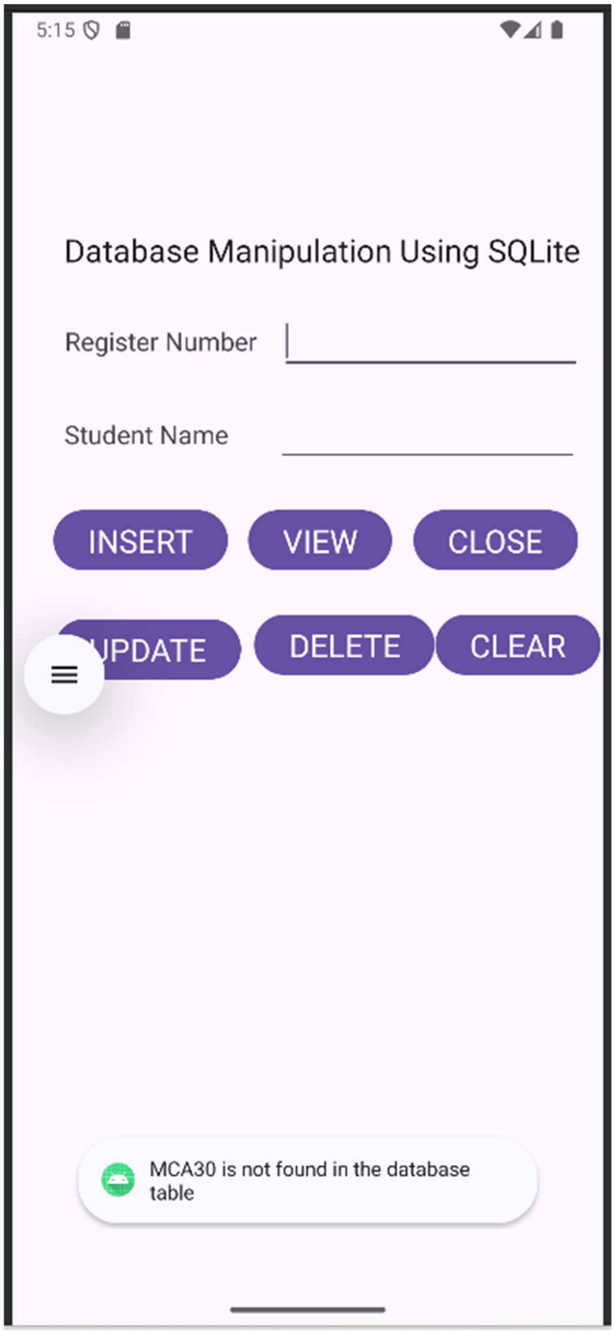
Database Manipulation Using SQLite

Register Number

Student Name

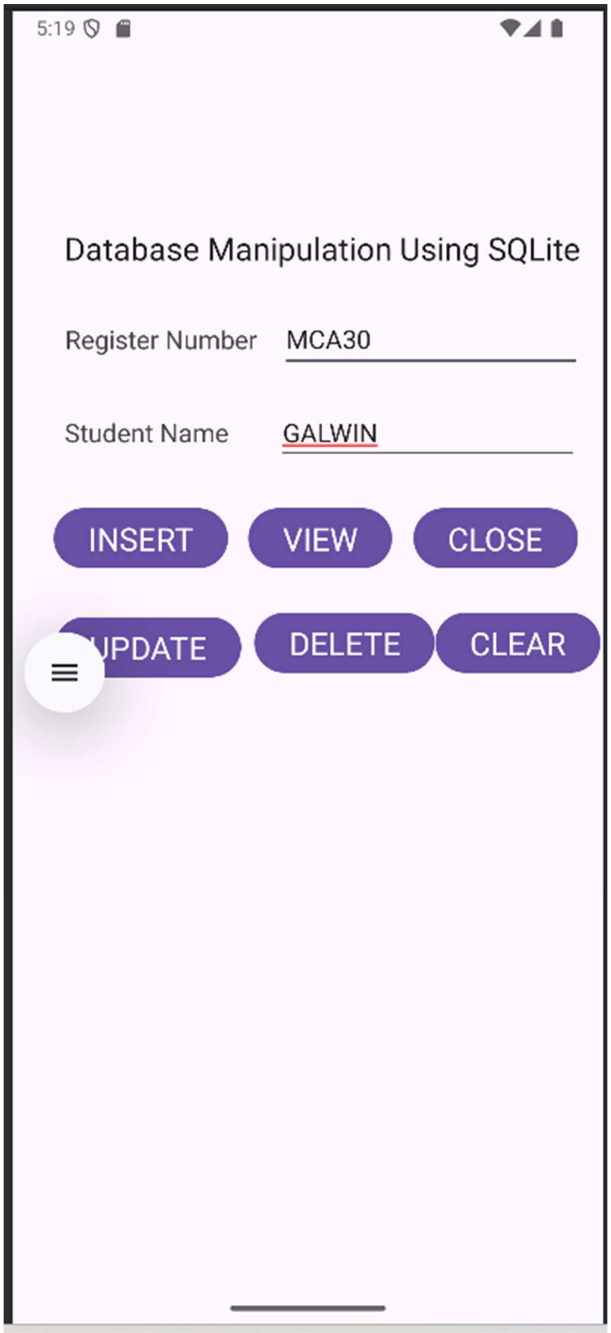
MCA30 deleted from the database table

Ensure that the record is deleted.



MCA30 is not found in the database table

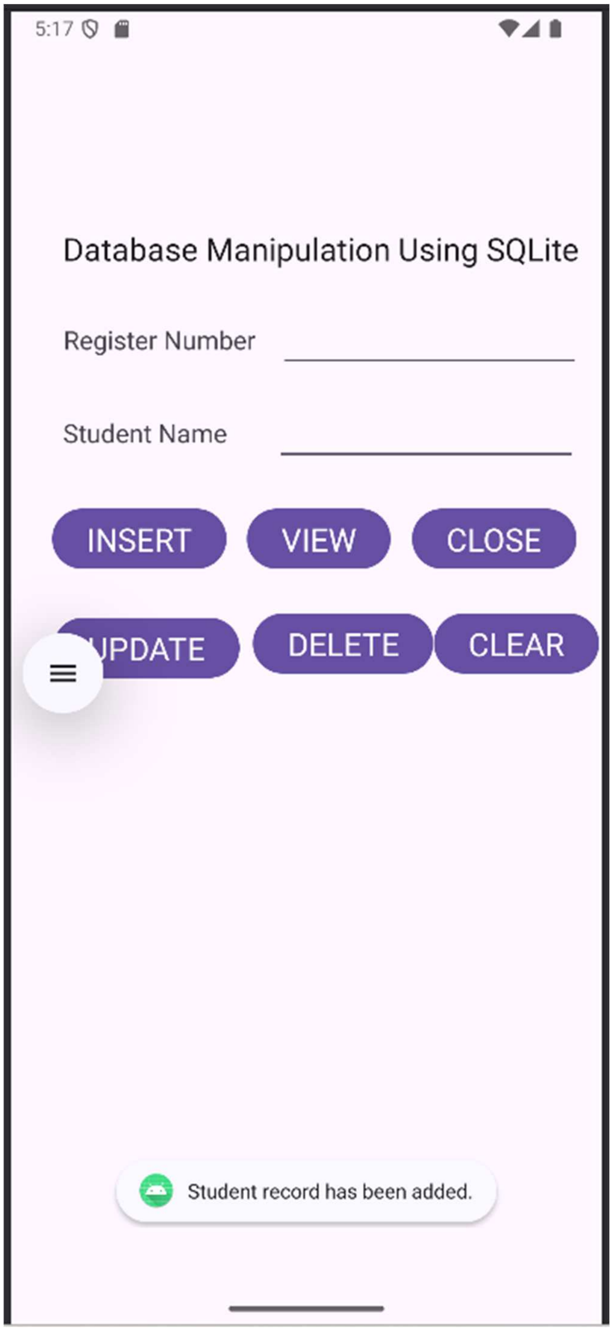
Insert Operation



Database Manipulation Using SQLite

Register Number MCA30

Student Name GALWIN



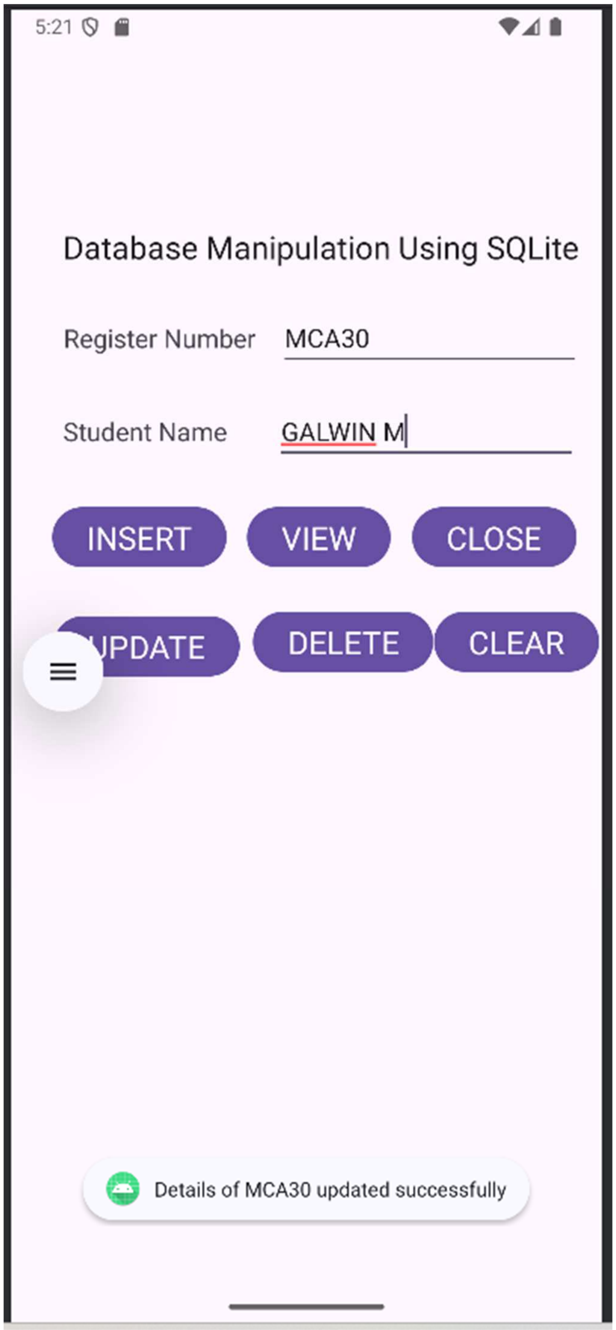
Database Manipulation Using SQLite

Register Number

Student Name

Student record has been added.

Update Operation



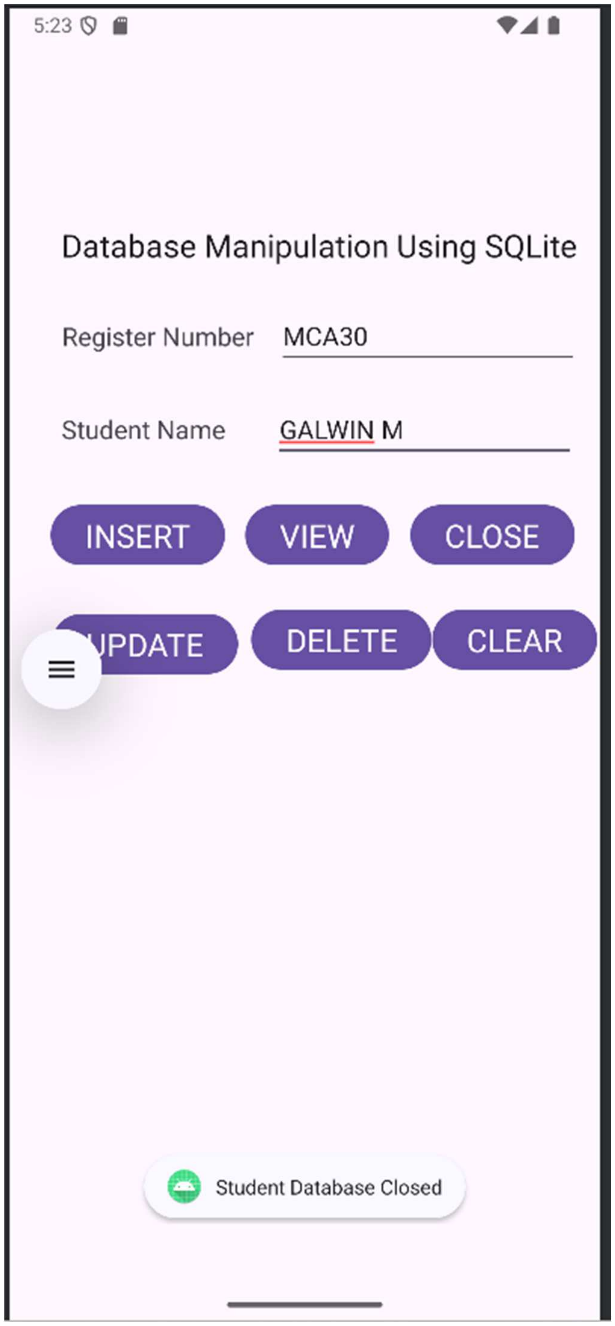
Database Manipulation Using SQLite

Register Number MCA30

Student Name GALWIN M

Details of MCA30 updated successfully

Database Close Operation



Database Manipulation Using SQLite

Register Number MCA30

Student Name GALWIN M

Student Database Closed