**MAD LAB**

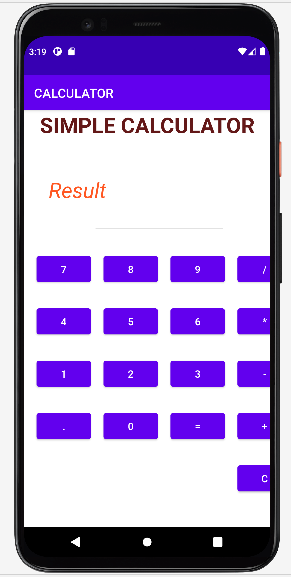
**Program 2: Simple Calculator**

**Java code**

**package** com.example.calculator;  
  
**import** androidx.appcompat.app.AppCompatActivity;  
**import** android.os.Bundle;  
**import** android.view.View;  
**import** android.widget.Button;  
**import** android.widget.EditText;  
**import** android.widget.Toast;  
  
**import** java.util.regex.Pattern;  
  
**public class** MainActivity **extends** AppCompatActivity **implements** View.OnClickListener  
{  
 Button **btnOne**, **btnTwo**, **btnThree**, **btnFour**, **btnFive**, **btnSix**;  
 Button **btnSeven**, **btnEight**, **btnNine**, **btnZero**;  
 Button **btnAdd**,**btnSub**,**btnMul**,**btnDiv**;  
 Button **btnClear**,**btnEqual**,**btnDot**;  
  
 EditText **txtResult**;  
  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_main***);  
  
 **btnOne**=(Button)findViewById(R.id.***button\_one***);  
 **btnOne**.setOnClickListener(**this**);  
  
 **btnTwo**=(Button)findViewById(R.id.***button\_two***);  
 **btnTwo**.setOnClickListener(**this**);  
  
 **btnThree**=(Button)findViewById(R.id.***button\_three***);  
 **btnThree**.setOnClickListener(**this**);  
  
 **btnFour**=(Button)findViewById(R.id.***button\_four***);  
 **btnFour**.setOnClickListener(**this**);  
  
 **btnFive**=(Button)findViewById(R.id.***button\_five***);  
 **btnFive**.setOnClickListener(**this**);  
  
 **btnSix**=(Button)findViewById(R.id.***button\_six***);  
 **btnSix**.setOnClickListener(**this**);  
  
 **btnSeven**=(Button)findViewById(R.id.***button\_seven***);  
 **btnSeven**.setOnClickListener(**this**);  
  
 **btnEight**=(Button)findViewById(R.id.***button\_eight***);  
 **btnEight**.setOnClickListener(**this**);  
  
 **btnNine**=(Button)findViewById(R.id.***button\_nine***);  
 **btnNine**.setOnClickListener(**this**);  
  
 **btnZero**=(Button)findViewById(R.id.***button\_zero***);  
 **btnZero**.setOnClickListener(**this**);  
  
  
 **btnAdd**=(Button)findViewById(R.id.***button\_add***);  
 **btnAdd**.setOnClickListener(**this**);  
  
 **btnSub**=(Button)findViewById(R.id.***button\_sub***);  
 **btnSub**.setOnClickListener(**this**);  
  
 **btnMul**=(Button)findViewById(R.id.***button\_mul***);  
 **btnMul**.setOnClickListener(**this**);  
  
 **btnDiv**=(Button)findViewById(R.id.***button\_div***);  
 **btnDiv**.setOnClickListener(**this**);  
  
  
 **btnClear**=(Button)findViewById(R.id.***button\_clear***);  
 **btnClear**.setOnClickListener(**this**);  
  
 **btnEqual**=(Button)findViewById(R.id.***button\_equals***);  
 **btnEqual**.setOnClickListener(**this**);  
  
 **btnDot**=(Button)findViewById(R.id.***button\_dot***);  
 **btnDot**.setOnClickListener(**this**);  
  
 **txtResult**=(EditText)findViewById(R.id.***txt\_result***);  
 **txtResult**.setText(**""**);  
 }  
 **public void** onClick(View v)  
 {  
 **if**(v.equals(**btnOne**))  
 **txtResult**.append(**"1"**);  
 **if**(v.equals(**btnTwo**))  
 **txtResult**.append(**"2"**);  
 **if**(v.equals(**btnThree**))  
 **txtResult**.append(**"3"**);  
 **if**(v.equals(**btnFour**))  
 **txtResult**.append(**"4"**);  
 **if**(v.equals(**btnFive**))  
 **txtResult**.append(**"5"**);  
 **if**(v.equals(**btnSix**))  
 **txtResult**.append(**"6"**);  
 **if**(v.equals(**btnSeven**))  
 **txtResult**.append(**"7"**);  
 **if**(v.equals(**btnEight**))  
 **txtResult**.append(**"8"**);  
 **if**(v.equals(**btnNine**))  
 **txtResult**.append(**"9"**);  
 **if**(v.equals(**btnZero**))  
 **txtResult**.append(**"0"**);  
 **if**(v.equals(**btnDot**))  
 **txtResult**.append(**"."**);  
 **if**(v.equals(**btnClear**))  
 **txtResult**.setText(**""**);  
  
 **if**(v.equals(**btnEqual**))  
 {  
 **try** {  
  
 String data = **txtResult**.getText().toString();  
 **if** (data.contains(**"/"**)) {  
 String[] operands = data.split(**"/"**);  
 **if**(operands.**length**==2) {  
 **double** operand1 = Double.*parseDouble*(operands[0]);  
 **double** operand2 = Double.*parseDouble*(operands[1]);  
 **double** result = operand1 / operand2;  
 **txtResult**.setText(String.*valueOf*(result));  
 }  
 **else** {  
 Toast.*makeText*(getBaseContext(),**"Invalid Input"**,  
 Toast.***LENGTH\_LONG***).show();  
 }  
  
 }  
 **else if** (data.contains(**"\*"**)) {  
 String[] operands = data.split(Pattern.*quote*(**"\*"**));  
 **if** (operands.**length** == 2) {  
 **double** operand1 = Double.*parseDouble*(operands[0]);  
 **double** operand2 = Double.*parseDouble*(operands[1]);  
 **double** result = operand1 \* operand2;  
 **txtResult**.setText(String.*valueOf*(result));  
 }  
  
 **else** {  
 Toast.*makeText*(getBaseContext(),**"Invalid Input"**,  
 Toast.***LENGTH\_LONG***).show();  
 }  
  
 }  
 **else if** (data.contains(**"+"**)) {  
 String[] operands = data.split(Pattern.*quote*(**"+"**));  
 **if**(operands.**length**==2) {  
 **double** operand1 = Double.*parseDouble*(operands[0]);  
 **double** operand2 = Double.*parseDouble*(operands[1]);  
 **double** result = operand1 + operand2;  
 **txtResult**.setText(String.*valueOf*(result));  
 }  
 **else** {  
 Toast.*makeText*(getBaseContext(),**"Invalid Input"**,  
 Toast.***LENGTH\_LONG***).show();  
 }  
 }  
 **else if** (data.contains(**"-"**)) {  
 String[] operands = data.split(**"-"**);  
 **if**(operands.**length**==2) {  
 **double** operand1 = Double.*parseDouble*(operands[0]);  
 **double** operand2 = Double.*parseDouble*(operands[1]);  
 **double** result = operand1 - operand2;  
 **txtResult**.setText(String.*valueOf*(result));  
 }  
 **else** {  
 Toast.*makeText*(getBaseContext(),**"Invalid Input"**,  
 Toast.***LENGTH\_LONG***).show();  
 }  
 }  
 }  
  
 **catch**(Exception e) { Toast.*makeText*(getBaseContext(),**"Invalid Input"**,  
 Toast.***LENGTH\_LONG***).show();  
 }  
 }  
  
 **if**(v.equals(**btnAdd**))  
 **txtResult**.append(**"+"**);  
 **if**(v.equals(**btnSub**))  
 **txtResult**.append(**"-"**);  
 **if**(v.equals(**btnMul**))  
 **txtResult**.append(**"\*"**);  
 **if**(v.equals(**btnDiv**))  
 **txtResult**.append(**"/"**);  
 }  
}

**XML Code**

*<?***xml version="1.0" encoding="utf-8"***?>*<**androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity"**>  
  
 <**Button  
 android:id="@+id/button\_clear"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginTop="30dp"  
 android:text="C"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toStartOf="@+id/button\_add"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_add"** />  
  
 <**Button  
 android:id="@+id/button\_zero"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="0"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_dot"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_two"** />  
  
 <**Button  
 android:id="@+id/button\_equals"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="="  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_zero"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_three"** />  
  
 <**Button  
 android:id="@+id/button\_add"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="+"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_equals"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_sub"** />  
  
 <**Button  
 android:id="@+id/button\_dot"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="."  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_one"** />  
  
  
 <**Button  
 android:id="@+id/button\_one"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="1"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_four"** />  
  
 <**Button  
 android:id="@+id/button\_sub"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="-"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_three"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_mul"** />  
  
 <**Button  
 android:id="@+id/button\_two"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="2"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_one"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_five"** />  
  
 <**Button  
 android:id="@+id/button\_three"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="3"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_two"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_six"** />  
  
 <**Button  
 android:id="@+id/button\_four"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="4"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_seven"** />  
  
 <**Button  
 android:id="@+id/button\_five"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="5"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_four"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_eight"** />  
  
 <**Button  
 android:id="@+id/button\_six"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="6"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_five"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_nine"** />  
  
 <**Button  
 android:id="@+id/button\_mul"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="\*"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_six"  
 app:layout\_constraintTop\_toBottomOf="@+id/button\_div"** />  
  
 <**Button  
 android:id="@+id/button\_seven"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="7"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/txt\_result"** />  
  
 <**Button  
 android:id="@+id/button\_eight"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="8"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_seven"  
 app:layout\_constraintTop\_toBottomOf="@+id/txt\_result"** />  
  
 <**Button  
 android:id="@+id/button\_div"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="/"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_nine"  
 app:layout\_constraintTop\_toBottomOf="@+id/txt\_result"** />  
  
 <**TextView  
 android:id="@+id/textView"  
 android:layout\_width="402dp"  
 android:layout\_height="67dp"  
 android:text="SIMPLE CALCULATOR"  
 android:textAlignment="center"  
 android:textColor="#631818"  
 android:textSize="34sp"  
 android:textStyle="bold"  
 tools:layout\_editor\_absoluteX="3dp"  
 tools:layout\_editor\_absoluteY="38dp"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"**/>  
  
 <**TextView  
 android:id="@+id/textView2"  
 android:layout\_width="114dp"  
 android:layout\_height="36dp"  
 android:layout\_marginTop="32dp"  
 android:text="Result"  
 android:textColor="#FF5722"  
 android:textSize="34sp"  
 android:textStyle="italic"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.141"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/textView"  
 app:layout\_constraintVertical\_bias="0.008"** />  
  
 <**EditText  
 android:id="@+id/txt\_result"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:ems="10"  
 android:inputType="textPersonName"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="0.497"  
 app:layout\_constraintStart\_toStartOf="@+id/textView2"  
 app:layout\_constraintTop\_toBottomOf="@+id/textView2"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:layout\_constraintVertical\_bias="0.244"** />  
  
 <**Button  
 android:id="@+id/button\_nine"  
 android:layout\_width="87dp"  
 android:layout\_height="53dp"  
 android:layout\_marginStart="20dp"  
 android:layout\_marginTop="30dp"  
 android:text="9"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toEndOf="@+id/button\_eight"  
 app:layout\_constraintTop\_toBottomOf="@+id/txt\_result"** />  
</**androidx.constraintlayout.widget.ConstraintLayout**>

****