2 Develop an Android application using controls like Button, Text View, Edit Text for designing a calculator having basic functionality like Addition, Subtraction, Multiplication, and Division.

**XML Code: Activity\_Main.xml**

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

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:app="http://schemas.android.com/apk/res-auto"

xmlns:tools="http://schemas.android.com/tools"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical"

tools:context=".MainActivity">

<TextView

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="SIMPLE CALCULATOR"

android:textSize="30sp"

android:textColor="@color/design\_default\_color\_primary\_dark"

android:textAlignment="center"

/>

<EditText

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Enter First Number"

android:id="@+id/num1"

android:textSize="20sp"

android:textAlignment="center"

/>

<EditText

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Enter Second Number"

android:id="@+id/num2"

android:textSize="20sp"

android:textAlignment="center"

/>

<TextView

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Result"

android:id="@+id/result"

android:textSize="20sp"

android:textAlignment="center"

/>

<LinearLayout

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_gravity="center"

android:orientation="horizontal">

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/seven"

android:text="7"

android:textAlignment="center"

android:onClick="seven"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/eight"

android:text="8"

android:textAlignment="center"

android:onClick="eight"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/nine"

android:text="9"

android:textAlignment="center"

android:onClick="nine"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/divide"

android:text="/"

android:textAlignment="center"

android:onClick="divide"

/>

</LinearLayout>

<LinearLayout

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:orientation="horizontal"

android:layout\_gravity="center">

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/four"

android:text="4"

android:textAlignment="center"

android:onClick="four"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/five"

android:text="5"

android:textAlignment="center"

android:onClick="five"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/six"

android:text="6"

android:textAlignment="center"

android:onClick="six"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/multiply"

android:text="\*"

android:textAlignment="center"

android:onClick="multiply"

/>

</LinearLayout>

<LinearLayout

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:orientation="horizontal"

android:layout\_gravity="center">

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/one"

android:text="1"

android:textAlignment="center"

android:onClick="one"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/two"

android:text="2"

android:textAlignment="center"

android:onClick="two"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/three"

android:text="3"

android:textAlignment="center"

android:onClick="three"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/add"

android:text="+"

android:textAlignment="center"

android:onClick="add"

/>

</LinearLayout>

<LinearLayout

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:orientation="horizontal"

android:layout\_gravity="center">

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/dot"

android:text="."

android:textAlignment="center"

android:onClick="dot"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/zero"

android:text="0"

android:textAlignment="center"

android:onClick="zero"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/equals"

android:text="="

android:textAlignment="center"

android:onClick="compute"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/minus"

android:text="- "

android:textAlignment="center"

android:onClick="sub"

/>

</LinearLayout>

<LinearLayout

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:orientation="horizontal"

android:layout\_gravity="center">

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/clear\_one\_digit\_at\_a\_time"

android:text="C"

android:textAlignment="center"

android:onClick="clear\_one\_digit\_at\_a\_time"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/clear\_one\_field\_completely"

android:text="CE"

android:textAlignment="center"

android:onClick="clear\_one\_field\_completely"

/>

<Button

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:id="@+id/All\_Clear"

android:text="AC"

android:textAlignment="center"

android:onClick="All\_Clear"

/>

</LinearLayout>

</LinearLayout>

**Java Coding Part: ActivityMain.java**

package com.example.labpgm2;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.view.View;

import android.widget.EditText;

import android.widget.TextView;

import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

EditText number1,number2;

TextView res;

char op;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

number1=findViewById(R.id.num1);

number2=findViewById(R.id.num2);

res=findViewById(R.id.result);

}

public void one(View v)

{

if(number1.hasFocus())

{

number1.append("1");

}

else if(number2.hasFocus())

{

number2.append("1");

}

else {

Toast.makeText(this, "Please get the focus of First/Second Number field",

Toast.LENGTH\_LONG).show();

}

}

public void two(View v)

{

if(number1.hasFocus())

{

number1.append("2");

}

else if(number2.hasFocus())

{

number2.append("2");

}

else {

Toast.makeText(this, "Please get the focus of First/Second Number field",

Toast.LENGTH\_LONG).show();

}

}

public void three(View v)

{

if(number1.hasFocus())

{

number1.append("3");

}

else if(number2.hasFocus())

{

number2.append("3");

}

else {

Toast.makeText(this, "Please get the focus of First/Second Number field",

Toast.LENGTH\_LONG).show();

}

}

public void four(View v)

{

if(number1.hasFocus())

{

number1.append("4");

}

else if(number2.hasFocus())

{

number2.append("4");

}

else {

Toast.makeText(this, "Please get the focus of First/Second Number field",

Toast.LENGTH\_LONG).show();

}

}

public void five(View v)

{

if(number1.hasFocus())

{

number1.append("5");

}

else if(number2.hasFocus())

{

number2.append("5");

}

else {

Toast.makeText(this, "Please get the focus of First/Second Number field",

Toast.LENGTH\_LONG).show();

}

}

public void six(View v)

{

if(number1.hasFocus())

{

number1.append("6");

}

else if(number2.hasFocus())

{

number2.append("6");

}

else {

Toast.makeText(this, "Please get the focus of First/Second Number field",

Toast.LENGTH\_LONG).show();

}

}

public void seven(View v)

{

if(number1.hasFocus())

{

number1.append("7");

}

else if(number2.hasFocus())

{

number2.append("7");

}

else {

Toast.makeText(this, "Please get the focus of First/Second Number field",

Toast.LENGTH\_LONG).show();

}

}

public void eight(View v)

{

if(number1.hasFocus())

{

number1.append("8");

}

else if(number2.hasFocus())

{

number2.append("8");

}

else {

Toast.makeText(this, "Please get the focus of First/Second Number field",

Toast.LENGTH\_LONG).show();

}

}

public void nine(View v)

{

if(number1.hasFocus())

{

number1.append("9");

}

else if(number2.hasFocus())

{

number2.append("9");

}

else {

Toast.makeText(this, "Please get the focus of First/Second Number field",

Toast.LENGTH\_LONG).show();

}

}

public void zero(View v)

{

if(number1.hasFocus())

{

number1.append("0");

}

else if(number2.hasFocus())

{

number2.append("0");

}

else {

Toast.makeText(this, "Please get the focus of First/Second Number field",

Toast.LENGTH\_LONG).show();

}

}

public void dot(View v)

{

if(number1.hasFocus())

{

number1.append(".");

}

else if(number2.hasFocus())

{

number2.append(".");

}

else {

Toast.makeText(this, "Please get the focus of First/Second Number field",

Toast.LENGTH\_LONG).show();

}

}

public void add(View v)

{

op='+';

}

public void sub(View v)

{

op='-';

}

public void multiply(View v)

{

op='\*';

}

public void divide(View v)

{

op='/';

}

public void compute(View v)

{

float n1,n2,r;

switch(op)

{

case '+': n1=Float.parseFloat(number1.getText().toString());

n2=Float.parseFloat(number2.getText().toString());

r=n1+n2;

res.setText(""+n1+"+"+n2+"="+r);

break;

case '-': n1=Float.parseFloat(number1.getText().toString());

n2=Float.parseFloat(number2.getText().toString());

r=n1-n2;

res.setText(""+n1+"- "+n2+"="+r);

break;

case '\*': n1=Float.parseFloat(number1.getText().toString());

n2=Float.parseFloat(number2.getText().toString());

r=n1\*n2;

res.setText(""+n1+"\*"+n2+"="+r);

break;

case '/': n1=Float.parseFloat(number1.getText().toString());

n2=Float.parseFloat(number2.getText().toString());

r=n1/n2;

res.setText(""+n1+"/"+n2+"="+r);

break;

}

}

public void All\_Clear(View v)

{

number1.setText("");

number2.setText("");

res.setText("");

}

public void clear\_one\_field\_completely(View v)

{

if(number1.hasFocus())

{

number1.setText("");

res.setText("");

}

else if(number2.hasFocus())

{

number2.setText("");

res.setText("");

}

else

{

Toast.makeText(this, "Please click on Number1/Number2 Field",

Toast.LENGTH\_LONG).show();

}

}

public void clear\_one\_digit\_at\_a\_time(View v)

{

if(number1.hasFocus())

{

String n;

n=number1.getText().toString();

// n=n.substring(0,n.length()-1); /// deletes digits from right to left

n=n.substring(1,n.length()); // deletes digits from left to right

number1.setText(n);

}

else if(number2.hasFocus())

{

String n;

n=number2.getText().toString();

// n=n.substring(0,n.length()-1); /// deletes digits from right to left

n=n.substring(1,n.length()); // deletes digits from left to right

number2.setText(n);

}

else

{

Toast.makeText(this, "Please click on Number1/Number2 Field",

Toast.LENGTH\_LONG).show();

}

}

}