1. Implement a full functional calculator using appropriate layout and event handling technique.

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## XML CODE

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/relative1"
    android:layout width="match_parent"
    android:layout height="match parent"
    tools:context=".MainActivity">
    <EditText
        android:id="@+id/edt1"
        android:layout width="match parent"
       android:layout height="wrap content"
        android:layout marginHorizontal="20dp"
        android:layout marginTop="20dp"/>
    <Button
        android:id="@+id/button1"
        style="?android:attr/buttonStyleSmall"
        android:layout width="wrap content"
        android:layout height="wrap content"
        android:layout alignEnd="@+id/button4"
        android:layout alignRight="@+id/button4"
        android:layout_below="@+id/edt1"
        android:layout marginTop="94dp"
        android:text="1" />
    <Button
        android:id="@+id/button2"
        style="?android:attr/buttonStyleSmall"
        android: layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
android:layout_alignTop="@+id/button1"
    android:layout toLeftOf="@+id/button3"
    android:layout toStartOf="@+id/button3"
    android:text="2" />
<Button
   android:id="@+id/button3"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout_height="wrap_content"
    android:layout_alignTop="@+id/button2"
    android:layout centerHorizontal="true"
    android:text="3" />
<Button
   android:id="@+id/button4"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout height="wrap content"
    android:layout below="@+id/button1"
    android:layout toLeftOf="@+id/button2"
    android:text="4" />
<Button
   android:id="@+id/button5"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout height="wrap content"
    android:layout alignBottom="@+id/button4"
    android:layout alignLeft="@+id/button2"
    android:layout alignStart="@+id/button2"
    android:text="5" />
<Button
    android:id="@+id/button6"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout_height="wrap_content"
    android:layout alignLeft="@+id/button3"
    android:layout alignStart="@+id/button3"
    android:layout below="@+id/button3"
   android:text="6" />
<Button
    android: id="@+id/button7"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout height="wrap content"
    android:layout_below="@+id/button4"
    android:layout toLeftOf="@+id/button2"
    android:text="7" />
<Button
    android:id="@+id/button8"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout height="wrap content"
```

```
android:layout alignLeft="@+id/button5"
    android:layout alignStart="@+id/button5"
    android:layout below="@+id/button5"
    android:text="8" />
<Button
   android:id="@+id/button9"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/button6"
    android:layout_alignStart="@+id/button6"
    android:layout below="@+id/button6"
    android:text="9" />
<Button
    android:id="@+id/buttonadd"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout height="wrap content"
    android:layout alignTop="@+id/button3"
    android:layout alignEnd="@+id/edt1"
    android:layout alignRight="@+id/edt1"
    android:layout marginStart="46dp"
    android:layout marginLeft="46dp"
    android:layout_toRightOf="@+id/button3"
    android:layout marginRight="20dp"
    android:text="+" />
<Button
    android:id="@+id/buttonsub"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout height="wrap content"
    android:layout below="@+id/buttonadd"
    android:layout alignStart="@+id/buttonadd"
    android:layout alignLeft="@+id/buttonadd"
    android:layout_alignEnd="@+id/buttonadd"
    android:layout_alignRight="@+id/buttonadd"
   android:text="-" />
<Button
    android:id="@+id/buttonmul"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout height="wrap content"
    android:layout below="@+id/buttonsub"
    android:layout alignStart="@+id/buttonsub"
    android:layout_alignLeft="@+id/buttonsub"
    android:layout alignParentEnd="true"
    android:layout alignParentRight="true"
    android:layout marginRight="20dp"
   android:text="*" />
<Button
    android: id="@+id/button10"
    style="?android:attr/buttonStyleSmall"
```

```
android:layout width="wrap content"
    android:layout height="wrap content"
    android:layout below="@+id/button7"
    android:layout_toLeftOf="@+id/button2"
    android:text="." />
<Button
   android:id="@+id/button0"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout_height="wrap_content"
    android:layout alignLeft="@+id/button8"
    android:layout alignStart="@+id/button8"
    android:layout below="@+id/button8"
    android: text="0" />
<Button
    android:id="@+id/buttonC"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout height="wrap content"
    android:layout alignLeft="@+id/button9"
    android:layout alignStart="@+id/button9"
    android:layout below="@+id/button9"
    android:text="C" />
<Button
    android:id="@+id/buttondiv"
    style="?android:attr/buttonStyleSmall"
    android:layout width="wrap content"
    android:layout height="wrap content"
    android:layout alignEnd="@+id/buttonmul"
    android:layout alignLeft="@+id/buttonmul"
    android:layout alignRight="@+id/buttonmul"
    android:layout alignStart="@+id/buttonmul"
    android:layout below="@+id/buttonmul"
    android:text="/" />
<Button
   android:id="@+id/buttoneql"
    android:layout width="wrap content"
    android:layout height="wrap content"
    android:layout alignEnd="@+id/buttondiv"
    android:layout alignLeft="@+id/button10"
    android:layout_alignRight="@+id/buttondiv"
    android:layout_alignStart="@+id/button10"
    android:layout below="@+id/button0"
    android:layout marginTop="37dp"
    android:layout marginRight="20dp"
    android:text="=" />
```

</RelativeLayout>

## **JAVA CODE**

```
package com.example.lab;
import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
public class MainActivity extends AppCompatActivity {
    Button button0, button1, button2, button3, button4, button5, button6,
            button7, button8, button9, buttonAdd, buttonSub, buttonDivision,
            buttonMul, button10, buttonC, buttonEqual;
    EditText editText;
    float mValueOne, mValueTwo;
   boolean Addition, Subtract, Multiplication, Division;
    @Override
   protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity main);
        button0 = (Button) findViewById(R.id.button0);
        button1 = (Button) findViewById(R.id.button1);
        button2 = (Button) findViewById(R.id.button2);
        button3 = (Button) findViewById(R.id.button3);
        button4 = (Button) findViewById(R.id.button4);
        button5 = (Button) findViewById(R.id.button5);
        button6 = (Button) findViewById(R.id.button6);
        button7 = (Button) findViewById(R.id.button7);
        button8 = (Button) findViewById(R.id.button8);
        button9 = (Button) findViewById(R.id.button9);
        button10 = (Button) findViewById(R.id.button10);
        buttonAdd = (Button) findViewById(R.id.buttonadd);
        buttonSub = (Button) findViewById(R.id.buttonsub);
        buttonMul = (Button) findViewById(R.id.buttonmul);
        buttonDivision = (Button) findViewById(R.id.buttondiv);
        buttonC = (Button) findViewById(R.id.buttonC);
        buttonEqual = (Button) findViewById(R.id.buttoneq1);
        editText = (EditText) findViewById(R.id.edt1);
        button1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                editText.setText(editText.getText() + "1");
        });
        button2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                editText.setText(editText.getText() + "2");
```

```
});
button3.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "3");
});
button4.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "4");
});
button5.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "5");
});
button6.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "6");
});
button7.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "7");
});
button8.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "8");
});
button9.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "9");
});
button0.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "0");
```

```
});
buttonAdd.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        if (editText == null) {
            editText.setText("");
        } else {
            mValueOne = Float.parseFloat(editText.getText() + "");
            Addition = true;
            editText.setText(null);
        }
    }
});
buttonSub.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        mValueOne = Float.parseFloat(editText.getText() + "");
        Subtract = true;
        editText.setText(null);
});
buttonMul.setOnClickListener(new View.OnClickListener() {
    public void onClick(View v) {
        mValueOne = Float.parseFloat(editText.getText() + "");
        Multiplication = true;
        editText.setText(null);
    }
});
buttonDivision.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        mValueOne = Float.parseFloat(editText.getText() + "");
        Division = true;
        editText.setText(null);
    }
});
buttonEqual.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        mValueTwo = Float.parseFloat(editText.getText() + "");
        if (Addition == true) {
            editText.setText(mValueOne + mValueTwo + "");
            Addition = false;
        if (Subtract == true) {
            editText.setText(mValueOne - mValueTwo + "");
            Subtract = false;
        if (Multiplication == true) {
            editText.setText(mValueOne * mValueTwo + "");
```

```
Multiplication = false;
            if (Division == true) {
                editText.setText(mValueOne / mValueTwo + "");
                Division = false;
            }
        }
    });
    buttonC.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            editText.setText("");
    });
    button10.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            editText.setText(editText.getText() + ".");
    });
}
```

## **OUTPUT**

