

## Q1. Implement Calculator using Grid or Linear Layout.

### MainActivity.java

```
package com.example.calculator;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private TextView resultTextView;
    private String currentNumber = "";
    private String operator = "";
    private double firstNumber = Double.NaN;
    private double secondNumber;

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

        resultTextView = findViewById(R.id.result);

        // Set up the button listeners
        int[] buttonIds = {
            R.id.button0, R.id.button1, R.id.button2, R.id.button3,
            R.id.button4, R.id.button5, R.id.button6, R.id.button7,
            R.id.button8, R.id.button9, R.id.buttonAdd, R.id.buttonSubtract,
            R.id.buttonMultiply, R.id.buttonDivide, R.id.buttonEquals, R.id.buttonClear
        };

        for (int id : buttonIds) {
            findViewById(id).setOnClickListener(this::onButtonClick);
        }
    }

    private void onButtonClick(View view) {
        Button button = (Button) view;
        String buttonText = button.getText().toString();

        switch (buttonText) {
```

```

        case "C":
            clear();
            break;
        case "=":
            calculate();
            break;
        case "+":
        case "-":
        case "*":
        case "/":
            if (!currentNumber.isEmpty()) {
                if (!Double.isNaN(firstNumber)) {
                    calculate();
                }
                operator = buttonText;
                firstNumber = Double.parseDouble(currentNumber);
                currentNumber = "";
            }
            break;
        default:
            currentNumber += buttonText;
            updateDisplay();
            break;
    }
}

```

```

private void calculate() {
    if (currentNumber.isEmpty() || operator.isEmpty()) return;

    secondNumber = Double.parseDouble(currentNumber());
    double result = 0;

    switch (operator) {
        case "+":
            result = firstNumber + secondNumber;
            break;
        case "-":
            result = firstNumber - secondNumber;
            break;
        case "*":
            result = firstNumber * secondNumber;
            break;
        case "/":
            if (secondNumber != 0) {
                result = firstNumber / secondNumber;
            } else {

```

```

        resultTextView.setText("Error");
        return;
    }
    break;
}

resultTextView.setText(String.format("%s %s %s = %s",
    firstNumber, operator, currentNumber(), result));
firstNumber = result;
currentNumber = "";
operator = "";
}

private void clear() {
    currentNumber = "";
    operator = "";
    firstNumber = Double.NaN;
    resultTextView.setText("0");
}

private void updateDisplay() {
    String displayText = (Double.isNaN(firstNumber) ? "" : (firstNumber + " " +
operator + " "))
        + currentNumber;
    resultTextView.setText(displayText);
}

private String currentNumber() {
    return currentNumber.isEmpty() ? "0" : currentNumber;
}
}

```

## activity main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    android:background="#FFFFFF">

    <!-- TextView to display result -->
    <TextView
        android:id="@+id/result"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginBottom="16dp"
        android:background="#FFFFFF"
        android:gravity="end"
        android:padding="24dp"
        android:text="0"
        android:textColor="#000000"
        android:textSize="48sp"
        android:maxLines="1"
        android:ellipsize="end" />

    <!-- First row of buttons -->
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        android:layout_marginBottom="8dp">

        <Button
            android:id="@+id/buttonClear"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="C"
            android:textSize="24sp"
            android:textColor="#D32F2F"
            android:background="@android:color/holo_red_light"
            android:layout_margin="4dp"
            android:elevation="4dp"/>

    <View
        android:layout_width="0dp"
```

```
        android:layout_height="0dp"
        android:layout_weight="1" />
```

```
<View
    android:layout_width="0dp"
    android:layout_height="0dp"
    android:layout_weight="1" />
```

```
<Button
    android:id="@+id/buttonDivide"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="/"
    android:textSize="24sp"
    android:textColor="#FFFFFF"
    android:background="@android:color/holo_blue_dark"
    android:layout_margin="4dp"
    android:elevation="4dp"/>
```

```
</LinearLayout>
```

```
<!-- Second row of buttons -->
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:layout_marginBottom="8dp">
```

```
<Button
    android:id="@+id/button7"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="7"
    android:textSize="24sp"
    android:textColor="#000000"
    android:background="#EEEEEE"
    android:layout_margin="4dp"
    android:elevation="4dp"/>
```

```
<Button
    android:id="@+id/button8"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="8"
```

```
        android:textSize="24sp"
        android:textColor="#000000"
        android:background="#EEEEEE"
        android:layout_margin="4dp"
        android:elevation="4dp"/>
```

```
<Button
    android:id="@+id/button9"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="9"
    android:textSize="24sp"
    android:textColor="#000000"
    android:background="#EEEEEE"
    android:layout_margin="4dp"
    android:elevation="4dp"/>
```

```
<Button
    android:id="@+id/buttonMultiply"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="*"
    android:textSize="24sp"
    android:textColor="#FFFFFF"
    android:background="@android:color/holo_blue_dark"
    android:layout_margin="4dp"
    android:elevation="4dp"/>
```

```
</LinearLayout>
```

```
<!-- Third row of buttons -->
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:layout_marginBottom="8dp">
```

```
<Button
    android:id="@+id/button4"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="4"
    android:textSize="24sp"
    android:textColor="#000000"
```

```
        android:background="#EEEEEE"
        android:layout_margin="4dp"
        android:elevation="4dp"/>
```

```
<Button
    android:id="@+id/button5"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="5"
    android:textSize="24sp"
    android:textColor="#000000"
    android:background="#EEEEEE"
    android:layout_margin="4dp"
    android:elevation="4dp"/>
```

```
<Button
    android:id="@+id/button6"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="6"
    android:textSize="24sp"
    android:textColor="#000000"
    android:background="#EEEEEE"
    android:layout_margin="4dp"
    android:elevation="4dp"/>
```

```
<Button
    android:id="@+id/buttonSubtract"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="-"
    android:textSize="24sp"
    android:textColor="#FFFFFF"
    android:background="@android:color/holo_blue_dark"
    android:layout_margin="4dp"
    android:elevation="4dp"/>
```

```
</LinearLayout>
```

```
<!-- Fourth row of buttons -->
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
```

```
android:layout_marginBottom="8dp">
```

```
<Button
    android:id="@+id/button1"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="1"
    android:textSize="24sp"
    android:textColor="#000000"
    android:background="#EEEEEE"
    android:layout_margin="4dp"
    android:elevation="4dp"/>
```

```
<Button
    android:id="@+id/button2"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="2"
    android:textSize="24sp"
    android:textColor="#000000"
    android:background="#EEEEEE"
    android:layout_margin="4dp"
    android:elevation="4dp"/>
```

```
<Button
    android:id="@+id/button3"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="3"
    android:textSize="24sp"
    android:textColor="#000000"
    android:background="#EEEEEE"
    android:layout_margin="4dp"
    android:elevation="4dp"/>
```

```
<Button
    android:id="@+id/buttonAdd"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="+"
    android:textSize="24sp"
    android:textColor="#FFFFFF"
```



```
        android:background="@android:color/holo_blue_dark"
        android:layout_margin="4dp"
        android:elevation="4dp"/>
</LinearLayout>

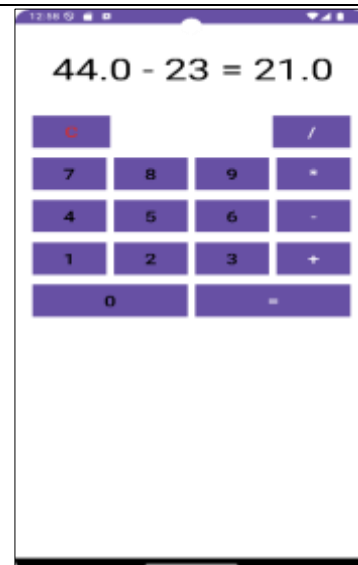
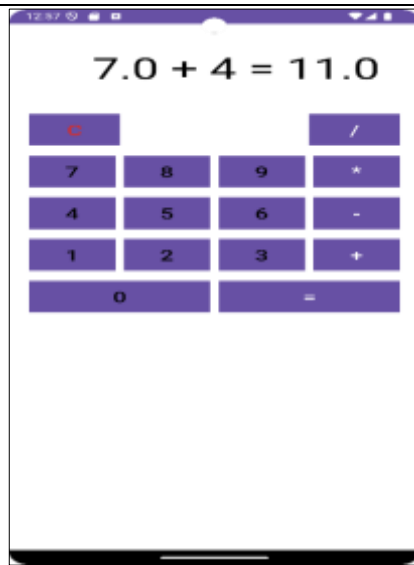
<!-- Fifth row of buttons -->
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:layout_marginBottom="8dp">

    <Button
        android:id="@+id/button0"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="2"
        android:text="0"
        android:textSize="24sp"
        android:textColor="#000000"
        android:background="#EEEEEE"
        android:layout_margin="4dp"
        android:elevation="4dp"/>

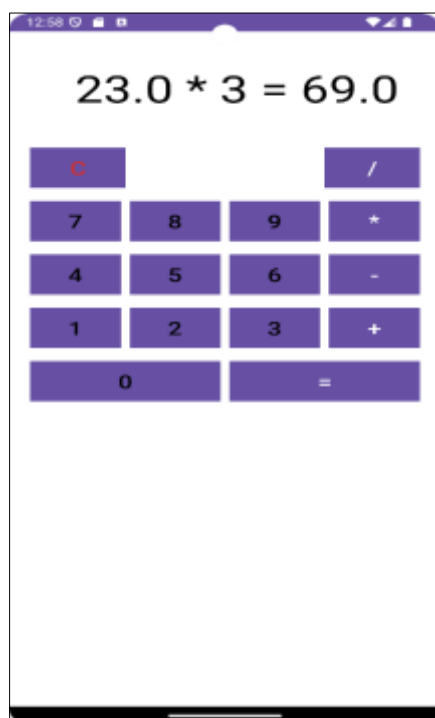
    <Button
        android:id="@+id/buttonEquals"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="2"
        android:text="="
        android:textSize="24sp"
        android:textColor="#FFFFFF"
        android:background="@android:color/holo_blue_dark"
        android:layout_margin="4dp"
        android:elevation="4dp"/>
</LinearLayout>
</LinearLayout>
```

**Output:**

|                         |                            |
|-------------------------|----------------------------|
| <b><i>Addition:</i></b> | <b><i>Subtraction:</i></b> |
|-------------------------|----------------------------|



### ***Multiplication:***



### ***Division:***

