# LAB EXPERIMENT : 09

9) Develop an Android application using controls like Button, TextView, EditText for designing a calculator having basic functionality like Addition, Subtraction, multiplication, and Division.

# AIM:

The aim of this project is to create a simple calculator application for Android using basic UI elements (Button, EditText, TextView) that can perform basic arithmetic operations such as addition, subtraction, multiplication, and division.

# ALGORITHM:

1. **Define the UI Elements:**
   - Use `EditText` for the user to input numbers.
   - Use `TextView` to display the result.
   - Use `Button` for the operations (addition, subtraction, multiplication, and division).
2. **Design Layout:**
   - Arrange the buttons and input fields in the XML layout.
3. **Get User Input:**
   - When a user inputs numbers and clicks an operation button, capture the numbers from the `EditText` fields.
4. **Perform Calculation:**
   - Based on the operation selected (addition, subtraction, multiplication, or division), perform the respective operation using the input numbers.
5. **Display Result:**
   - Show the result of the operation in the `TextView`.

# SOURCE CODE:

```
package com.example.calculator;


import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.TextView;

import android.widget.Toast;
```

```
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText editTextNum1, editTextNum2;
    private TextView resultTextView;
    private Button addButton, subtractButton, multiplyButton, divideButton;

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

        editTextNum1 = findViewById(R.id.editTextNum1);
        editTextNum2 = findViewById(R.id.editTextNum2);
        resultTextView = findViewById(R.id.resultTextView);

        addButton = findViewById(R.id.addButton);
        subtractButton = findViewById(R.id.subtractButton);
        multiplyButton = findViewById(R.id.multiplyButton);
        divideButton = findViewById(R.id.divideButton);

        addButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                performOperation("add");
            }
        });

        subtractButton.setOnClickListener(new View.OnClickListener() {
            @Override
```

```
        public void onClick(View v) {
            performOperation("subtract");
        }
    });

    multiplyButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            performOperation("multiply");
        }
    });

    divideButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            performOperation("divide");
        }
    });
}

private void performOperation(String operation) {
    String num1Str = editTextNum1.getText().toString();
    String num2Str = editTextNum2.getText().toString();

    if (num1Str.isEmpty() || num2Str.isEmpty()) {
        Toast.makeText(MainActivity.this, "Please enter both numbers",
Toast.LENGTH_SHORT).show();
        return;
    }

    double num1 = Double.parseDouble(num1Str);
```

```
        double num2 = Double.parseDouble(num2Str);
        double result = 0;

        switch (operation) {
            case "add":
                result = num1 + num2;
                break;
            case "subtract":
                result = num1 - num2;
                break;
            case "multiply":
                result = num1 * num2;
                break;
            case "divide":
                if (num2 != 0) {
                    result = num1 / num2;
                } else {
                    Toast.makeText(MainActivity.this, "Cannot divide by zero",
Toast.LENGTH_SHORT).show();
                    return;
                }
                break;
        }

        resultTextView.setText("Result: " + result);
    }
}
```

# 2. 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">

<EditText
   android:id="@+id/editTextNum1"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:hint="Enter number 1"
   android:inputType="numberDecimal" />

<EditText
   android:id="@+id/editTextNum2"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:hint="Enter number 2"
   android:inputType="numberDecimal" />

<TextView
   android:id="@+id/resultTextView"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="Result: "
   android:textSize="18sp"
   android:layout_marginTop="20dp"/>

<LinearLayout
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:orientation="horizontal"
   android:layout_marginTop="20dp"
```

```
        android:gravity="center">

        <Button
            android:id="@+id/addButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Add" />

        <Button
            android:id="@+id/subtractButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Subtract"
            android:layout_marginLeft="10dp" />

        <Button
            android:id="@+id/multiplyButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Multiply"
            android:layout_marginLeft="10dp" />

        <Button
            android:id="@+id/divideButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Divide"
            android:layout_marginLeft="10dp" />
    </LinearLayout>
</LinearLayout>
```

# RESULT:

That's the basic implementation for a simple calculator in Android using `Button`, `TextView`, and `EditText`

# OUTPUT: