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: