EXP 9 CALCULATOR APP

AIM:

To develop a basic Android calculator application using `Button`, `TextView`, and `EditText` controls for performing simple arithmetic operations — Addition, Subtraction, Multiplication, and Division.

ALGORITHM:

- Initialize the user interface with two `EditText` inputs, a `TextView` for the result, and four `Button` controls for operations.
- User enters two numbers in the `EditText` fields.
- Wait for the user to press an operation button (+, −, ×, ÷).
- Read both numbers from the `EditText` fields as strings.
- Check if both inputs are non-empty and convert them to numbers.
- Based on the button clicked, execute the corresponding arithmetic operation.
- If division is selected and the second number is zero, display an error message.
- Show the final result in the `TextView` or an error message if input is invalid.

PROGRAM:

Activity_main.xml (UI Layout):

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="20dp"
    android:background="#ECEFF1">

    <EditText
        android:id="@+id/number1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter First Number"
        android:inputType="numberDecimal"
```

```
    android:layout_marginBottom="15dp"
    android:background="@android:drawable/editbox_background" />

<EditText
    android:id="@+id/number2"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter Second Number"
    android:inputType="numberDecimal"
    android:layout_below="@id/number1"
    android:layout_marginBottom="15dp"
    android:background="@android:drawable/editbox_background" />

<TextView
    android:id="@+id/result"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Result will appear here"
    android:textSize="18sp"
    android:textColor="#000"
    android:layout_below="@id/number2"
    android:layout_marginBottom="20dp"
    android:padding="10dp"
    android:background="#CFD8DC" />

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:layout_below="@id/result"
    android:gravity="center"
    android:weightSum="4">

    <Button
        android:id="@+id/add"
        android:layout_width="0dp"
        android:layout_weight="1"
        android:layout_height="wrap_content"
        android:text="+" />

    <Button
        android:id="@+id/subtract"
        android:layout_width="0dp"
        android:layout_weight="1"
        android:layout_height="wrap_content"
        android:text="-" />

    <Button
```

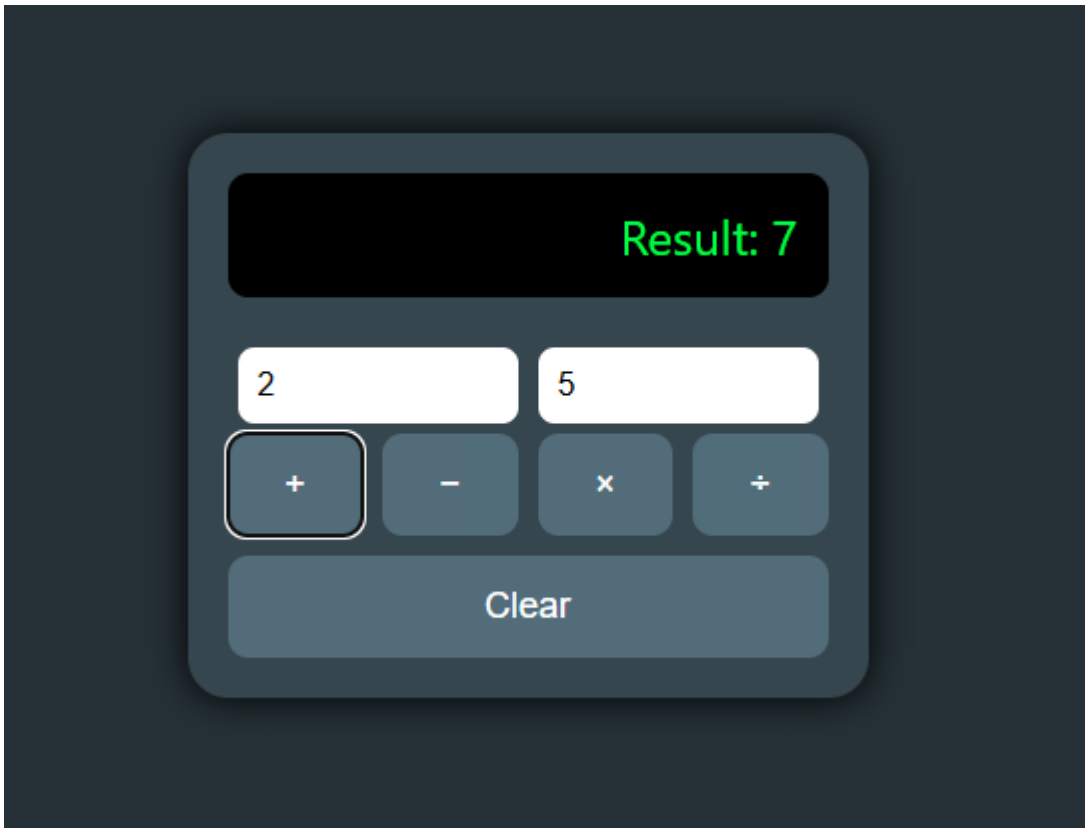
```
        android:id="@+id/multiply"
        android:layout_width="0dp"
        android:layout_weight="1"
        android:layout_height="wrap_content"
        android:text="×" />

    <Button
        android:id="@+id/divide"
        android:layout_width="0dp"
        android:layout_weight="1"
        android:layout_height="wrap_content"
        android:text="÷" />
  </LinearLayout>
</RelativeLayout>
```

MainActivity.java (Java Code):

```
package com.example.calculator;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {

  EditText number1, number2;
  TextView result;
  Button add, subtract, multiply, divide;

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

    number1 = findViewById(R.id.number1);
    number2 = findViewById(R.id.number2);
    result = findViewById(R.id.result);
    add = findViewById(R.id.add);
    subtract = findViewById(R.id.subtract);
    multiply = findViewById(R.id.multiply);
    divide = findViewById(R.id.divide);

    add.setOnClickListener(view -> calculate('+'));
    subtract.setOnClickListener(view -> calculate('-'));
    multiply.setOnClickListener(view -> calculate('*'));
```

```
        divide.setOnClickListener(view -> calculate('/'));
    }

    private void calculate(char operator) {
        String num1 = number1.getText().toString().trim();
        String num2 = number2.getText().toString().trim();

        if (num1.isEmpty() || num2.isEmpty()) {
            result.setText("Please enter both numbers.");
            return;
        }

        try {
            double a = Double.parseDouble(num1);
            double b = Double.parseDouble(num2);
            double res = 0;

            switch (operator) {
                case '+':
                    res = a + b;
                    break;
                case '-':
                    res = a - b;
                    break;
                case '*':
                    res = a * b;
                    break;
                case '/':
                    if (b == 0) {
                        result.setText("Error: Division by zero!");
                        return;
                    }
                    res = a / b;
                    break;
            }
            result.setText("Result: " + res);
        } catch (NumberFormatException e) {
            result.setText("Invalid Input!");
        }
    }
}
```

OUTPUT:



RESULT: Thus the calculator app is developed.