Problem 4: Basic Calculator

Exercise Objective: Create a simple Android calculator app that performs basic arithmetic operations: addition, subtraction, multiplication, and division.

Problem Statement 4: The app should have two input fields for entering numbers and buttons for each of the four arithmetic operations. Upon selecting an operation and pressing the "Calculate" button, the app should display the result.

Expected Output: The app displays the result of the arithmetic operation.

activity main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout</pre>
    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:layout width="match parent"
    android:layout height="match parent"
    android:id="@+id/main"
    tools:context=".MainActivity">
    <!-- Row 1: 7, 8, 9, /-->
    <TextView
        android:id="@+id/tvDisplay"
        android:layout width="0dp"
        android:layout height="wrap content"
        android:layout marginTop="72dp"
        android:background="@android:color/darker gray"
        android:padding="16dp"
        android:text="0"
        android:textAlignment="textEnd"
        android:textSize="32sp"
        app:layout constraintEnd toEndOf="parent"
        app:layout constraintHorizontal bias="0.0"
        app:layout constraintStart toStartOf="parent"
        app:layout constraintTop toTopOf="parent" />
    <Button
        android:id="@+id/btnSeven"
        android:layout width="0dp"
        android:layout height="wrap content"
        android:text="7"
        app:layout constraintTop toBottomOf="@id/tvDisplay"
        app:layout constraintStart toStartOf="parent"
        app:layout constraintEnd toStartOf="@id/btnEight"
        app:layout constraintHorizontal chainStyle="spread"
```

```
android:onClick="numberEvent"/>
<Button
    android:id="@+id/btnEight"
    android:layout width="0dp"
    android: layout height="wrap content"
    android:text="8"
    app:layout constraintTop toTopOf="@id/btnSeven"
    app:layout constraintStart toEndOf="@id/btnSeven"
    app:layout constraintEnd toStartOf="@id/btnNine"
    android:onClick="numberEvent"/>
<Button
    android:id="@+id/btnNine"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="9"
    app:layout constraintTop toTopOf="@id/btnEight"
    app:layout constraintStart toEndOf="@id/btnEight"
    app:layout constraintEnd toStartOf="@id/btnDivide"
    android:onClick="numberEvent"/>
<Button
    android:id="@+id/btnDivide"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="/"
    app:layout constraintTop toTopOf="@id/btnNine"
    app:layout constraintStart toEndOf="@id/btnNine"
    app:layout constraintEnd toEndOf="parent"
    android:onClick="operationEvent"/>
<!-- Row 2: 4, 5, 6, * -->
<Button
    android:id="@+id/btnFour"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="4"
    app:layout constraintTop toBottomOf="@id/btnSeven"
    app:layout constraintStart toStartOf="parent"
    app:layout constraintEnd toStartOf="@id/btnEight"
    app:layout constraintHorizontal chainStyle="spread"
    android:onClick="numberEvent"/>
<Button
    android:id="@+id/btnFive"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="5"
    app:layout_constraintTop toTopOf="@id/btnFour"
    app:layout constraintStart toEndOf="@id/btnFour"
    app:layout constraintEnd toStartOf="@id/btnSix"
```

```
android:onClick="numberEvent"/>
<Button
    android:id="@+id/btnSix"
    android:layout width="0dp"
    android: layout height="wrap content"
    android:text="6"
    app:layout constraintTop toTopOf="@id/btnFive"
    app:layout constraintStart toEndOf="@id/btnFive"
    app:layout constraintEnd toStartOf="@id/btnMultiply"
    android:onClick="numberEvent"/>
<Button
    android:id="@+id/btnMultiply"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="*"
    app:layout constraintTop toTopOf="@id/btnSix"
    app:layout constraintStart toEndOf="@id/btnSix"
    app:layout constraintEnd toEndOf="parent"
    android:onClick="operationEvent"/>
<!-- Row 3: 1, 2, 3, - -->
<Button
    android:id="@+id/btnOne"
    android:layout width="0dp"
    android: layout height="wrap content"
    android:text="1"
    app:layout constraintTop toBottomOf="@id/btnFour"
    app:layout constraintStart toStartOf="parent"
    app:layout constraintEnd toStartOf="@id/btnTwo"
    app:layout constraintHorizontal chainStyle="spread"
    android:onClick="numberEvent"/>
<Button
    android:id="@+id/btnTwo"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="2"
    app:layout constraintTop toTopOf="@id/btnOne"
    app:layout constraintStart toEndOf="@id/btnOne"
    app:layout constraintEnd toStartOf="@id/btnThree"
    android:onClick="numberEvent"/>
    android:id="@+id/btnThree"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="3"
    app:layout constraintTop toTopOf="@id/btnTwo"
    app:layout constraintStart toEndOf="@id/btnTwo"
```

```
app:layout constraintEnd toStartOf="@id/btnMinus"
    android:onClick="numberEvent"/>
<Button
    android:id="@+id/btnMinus"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="-"
    app:layout constraintTop toTopOf="@id/btnThree"
    app:layout constraintStart toEndOf="@id/btnThree"
    app:layout constraintEnd toEndOf="parent"
    android:onClick="operationEvent"/>
<!-- Row 4: 0, C, =, + -->
<Button
    android:id="@+id/btnZero"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="0"
    app:layout constraintTop toBottomOf="@id/btnOne"
    app:layout constraintStart toStartOf="parent"
    app:layout constraintEnd toStartOf="@id/btnClear"
    app:layout constraintHorizontal chainStyle="spread"
    android:onClick="numberEvent"/>
<Button
    android:id="@+id/btnClear"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="C"
    app:layout constraintTop toTopOf="@id/btnZero"
    app:layout constraintStart toEndOf="@id/btnZero"
    app:layout constraintEnd toStartOf="@id/btnEquals"
    android:onClick="clearEvent"/>
<Button
    android:id="@+id/btnEquals"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="="
    app:layout constraintTop toTopOf="@id/btnClear"
    app:layout constraintStart toEndOf="@id/btnClear"
    app:layout constraintEnd toStartOf="@id/btnAdd"
    android:onClick="equalEvent"/>
<Button
    android:id="@+id/btnAdd"
    android:layout width="0dp"
    android:layout height="wrap content"
    android:text="+"
    app:layout constraintTop toTopOf="@id/btnEquals"
```

```
app:layout_constraintStart_toEndOf="@id/btnEquals"
app:layout_constraintEnd_toEndOf="parent"
android:onClick="operationEvent"/>
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.example.basiccalculator;
import android.os.Bundle;
import android.view.View;
import android.widget.TextView;
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;
public class MainActivity extends AppCompatActivity {
    TextView tvDisplay;
   private double firstNumber = 0;
   private String operation = null;
    private boolean isNewOperation = true;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity main);
ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.ma
in ), (v, insets) -> {
                Insets systemBars =
insets.getInsets(WindowInsetsCompat.Type.systemBars());
        v.setPadding(systemBars.left, systemBars.top,
                systemBars.right, systemBars.bottom);
        return insets;
        tvDisplay = findViewById(R.id.tvDisplay);
    }
    public void numberEvent(View view) {
        if (isNewOperation) {
            tvDisplay.setText("");
```

```
}
        isNewOperation = false;
        String number = tvDisplay.getText().toString();
        int id = view.getId();
        if (id == R.id.btnZero) {
            number += "0";
        } else if (id == R.id.btnOne) {
            number += "1";
        } else if (id == R.id.btnTwo) {
            number += "2";
        } else if (id == R.id.btnThree) {
            number += "3";
        } else if (id == R.id.btnFour) {
            number += "4";
        } else if (id == R.id.btnFive) {
            number += "5";
        } else if (id == R.id.btnSix) {
            number += "6";
        } else if (id == R.id.btnSeven) {
            number += "7";
        } else if (id == R.id.btnEight) {
            number += "8";
        } else if (id == R.id.btnNine) {
            number += "9";
        tvDisplay.setText(number);
    }
    public void operationEvent(View view) {
        isNewOperation = true;
        firstNumber =
Double.parseDouble(tvDisplay.getText().toString());
        int id = view.getId();
        if (id == R.id.btnAdd) {
            operation = "+";
        } else if (id == R.id.btnMinus) {
            operation = "-";
        } else if (id == R.id.btnMultiply) {
            operation = "*";
        } else if (id == R.id.btnDivide) {
            operation = "/";
        }
    }
    public void equalEvent(View view) {
        if (operation == null) {
```

```
tvDisplay.setText("No operation set");
        isNewOperation = true;
        return;
    }
    String newNumber = tvDisplay.getText().toString();
    double result = 0.0;
    switch (operation) {
        case "+":
            result = firstNumber +
                    Double.parseDouble(newNumber);
            break;
        case "-":
            result = firstNumber -
                    Double.parseDouble(newNumber);
            break;
        case "*":
            result = firstNumber *
                    Double.parseDouble(newNumber);
            break;
        case "/":
            if (Double.parseDouble(newNumber) != 0) {
                result = firstNumber /
                        Double.parseDouble(newNumber);
            } else {
                tvDisplay.setText("Error");
                isNewOperation = true;
                return;
            break;
    tvDisplay.setText(String.valueOf(result));
    isNewOperation = true;
}
public void clearEvent(View view) {
    tvDisplay.setText("0");
    isNewOperation = true;
    firstNumber = 0;
    operation = null;
}
```