Ex. No. : 02 **Date: 28/01/2025**

Register No : 221701019 **Name: HARSHATH V**

SIMPLE CALCULATOR

Aim

Develop a simple calculator to perform arithmetic and mathematical functions using Math class.

Procedure:

Step 1 : File -> New Project

Provide the application "Calculator" and Click "Next"

Step 2 : Select the target android devices

Select the minimum SDK to run the application. Click "Next".

Step 3 : Choose the activity for the application (By default choose "Blank Activity).

Click "Next".

Step 4 : Enter activity name and click & quote.

Step 5 : Edit the program.

Step 6 : Run the application, 2-ways to run the application.

1. Running through emulator
2. Running through mobile device

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools">

  <application
    android:allowBackup="true"
    android:dataExtractionRules="@xml/data_extraction_rules"
    android:fullBackupContent="@xml/backup_rules"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app_name"
    android:roundIcon="@mipmap/ic_launcher_round"
    android:supportsRtl="true"
    android:theme="@style/Theme.Ex152"
    tools:targetApi="31">
    <activity
      android:name=".MainActivity"
      android:exported="true">
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />

        <category android:name="android.intent.category.LAUNCHER" />
      </intent-filter>
    </activity>
  </application>

</manifest>
```

MainActivity.kt:

```
package com.example.ex15_2

import android.os.Bundle
import android.view.View
import android.widget.Button
import android.widget.EditText
import androidx.appcompat.app.AppCompatActivity
import kotlin.math.*
```

```
class MainActivity : AppCompatActivity() {
    private lateinit var inputField: EditText
    private var input = ""

    override fun onCreate(savedInstanceState: Bundle?) {
      super.onCreate(savedInstanceState)
      setContentView(R.layout.activity_main)
      inputField = findViewById(R.id.etInput)
    }

    fun buttonClick(view: View) {
      val button = view as Button
      input += button.text.toString()
      inputField.setText(input)
    }

    fun clearInput(view: View) {
      input = ""
      inputField.setText("")
    }

    fun applyFunction(view: View) {
      val button = view as Button
      val function = button.text.toString()

      try {
        val value = input.toDouble()
        val result = when (function) {
          "sin" -> sin(Math.toRadians(value))
          "cos" -> cos(Math.toRadians(value))
          "tan" -> tan(Math.toRadians(value))
          "sqrt" -> sqrt(value)
          "log" -> log10(value)
          "ln" -> ln(value)
          else -> value
        }
```

```
            input = result.toString()
            inputField.setText(input)
        } catch (e: Exception) {
            inputField.setText("Error")
            input = ""
        }
    }

    fun evaluate(view: View) {
        try {
            // Support only simple 2-operand expressions like "3+4", "9mod2", etc.
            val operators = listOf("+", "-", "*", "/", "mod", "pow")
            var result = 0.0

            for (op in operators) {
                if (input.contains(op)) {
                    val parts = input.split(op)
                    if (parts.size == 2) {
                        val a = parts[0].toDouble()
                        val b = parts[1].toDouble()
                        result = when (op) {
                            "+" -> a + b
                            "-" -> a - b
                            "*" -> a * b
                            "/" -> a / b
                            "mod" -> a % b
                            "pow" -> a.pow(b)
                            else -> 0.0
                        }
                        input = result.toString()
                        inputField.setText(input)
                        return
                    }
                }
            }
```

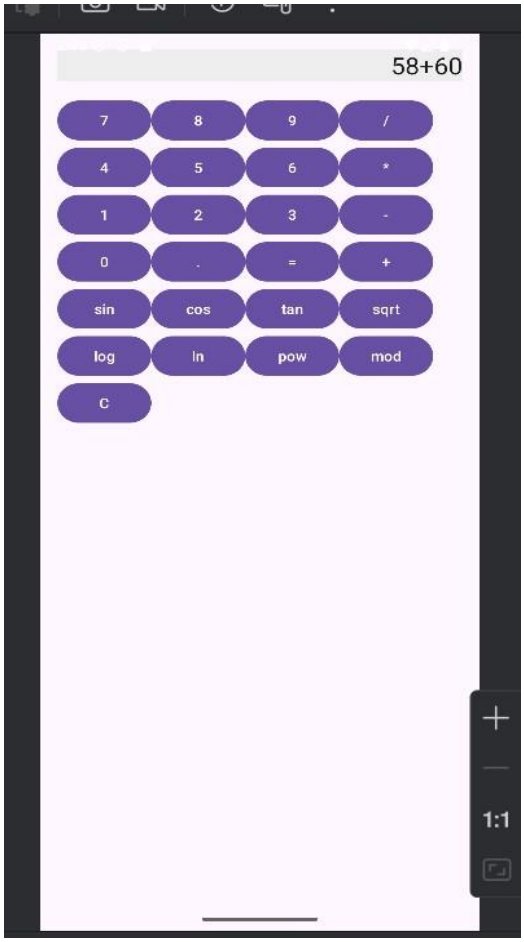
```
        inputField.setText("Invalid")
        } catch (e: Exception) {
            inputField.setText("Error")
            input = ""
        }
    }
}
```

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<ScrollView xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <LinearLayout
        android:orientation="vertical"
        android:padding="16dp"
        android:gravity="center"
        android:layout_width="match_parent"
        android:layout_height="wrap_content">

        <EditText
            android:id="@+id/etInput"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:textSize="24sp"
            android:hint="0"
            android:gravity="end"
            android:inputType="none"
            android:focusable="false"
            android:background="#eeeeee" />

        <GridLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:columnCount="4"
            android:layout_marginTop="16dp">
```

```
        <!-- Numbers and basic operations -->
        <Button android:text="7" android:onClick="buttonClick"/>
        <Button android:text="8" android:onClick="buttonClick"/>
        <Button android:text="9" android:onClick="buttonClick"/>
        <Button android:text="/" android:onClick="buttonClick"/>

        <Button android:text="4" android:onClick="buttonClick"/>
        <Button android:text="5" android:onClick="buttonClick"/>
        <Button android:text="6" android:onClick="buttonClick"/>
        <Button android:text="*" android:onClick="buttonClick"/>

        <Button android:text="1" android:onClick="buttonClick"/>
        <Button android:text="2" android:onClick="buttonClick"/>
        <Button android:text="3" android:onClick="buttonClick"/>
        <Button android:text="-" android:onClick="buttonClick"/>

        <Button android:text="0" android:onClick="buttonClick"/>
        <Button android:text="." android:onClick="buttonClick"/>
        <Button android:text="=" android:onClick="evaluate"/>
        <Button android:text="+" android:onClick="buttonClick"/>

        <!-- Scientific functions -->
        <Button android:text="sin" android:onClick="applyFunction"/>
        <Button android:text="cos" android:onClick="applyFunction"/>
        <Button android:text="tan" android:onClick="applyFunction"/>
        <Button android:text="sqrt" android:onClick="applyFunction"/>

        <Button android:text="log" android:onClick="applyFunction"/>
        <Button android:text="ln" android:onClick="applyFunction"/>
        <Button android:text="pow" android:onClick="buttonClick"/>
        <Button android:text="mod" android:onClick="buttonClick"/>

        <Button android:text="C" android:onClick="clearInput"/>
    </GridLayout>
</LinearLayout>
</ScrollView>
```

Output :



Result:

The Application developed using Android Studio was done.