**Ex.No. : 02 Date:24.02.2025**

**RegisterNo.:221701004 Name:Adhithya A**

GUIComponents

# Aim

Developascientificcalculatortoperformarithmeticandmathematicalfunctions using Math class.

[Yourscientificcalculatorshouldcontain+,\*,/,=,cos,sin,tan,pow,sqrt,log,tan and mod].

## Procedure:

**Step1:**File->NewProject

ProvidetheapplicationnameandClick“Next”

**Step2:**Selectthetargetandroiddevices

SelecttheminimumSDKtoruntheapplication.Click“Next”.

**Step3:**Choosetheactivityfortheapplication(Bydefaultchoose“BlankActivity).

Click “Next”.

**Step4:**Enteractivitynameandclick&quot;Finish&quot;.

**Step5:**Edittheprogram.

**Step 6:** Runtheapplication,2-waystorunthe application.

1. Runningthroughemulator
2. Runningthroughmobiledevice

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## AndroidManifest.xml

<?xmlversion="1.0"encoding="utf-8"?>

<manifest xmlns:android="<http://schemas.android.com/apk/res/android>"xmlns:tools=["http://schemas.android.com/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.Ex2"

tools:targetApi="31">

<activity android:name=".MainActivity"android:exported="true">

<intent-filter>

<actionandroid:name="android.intent.action.MAIN"/>

<categoryandroid:name="android.intent.category.LAUNCHER"/>

</intent-filter>

</activity>

</application>

</manifest>

## Activity\_main.xml

<?xmlversion="1.0"encoding="utf-8"?>

<ScrollView

xmlns:android=["http://sche](http://sche/) mas.android.com/apk/res/a ndroid"

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xmlns:app="[http://schemas.](http://schemas/) android.com/apk/res-auto"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:padding="16dp">

<LinearLayout

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:orientation="vertical"

android:gravity="center\_ho rizontal">

<!--Fixed:Added layout\_width and layout\_height -->

<com.google.android.mater ial.textfield.TextInputLayo ut

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android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:minHeight="56dp"

app:boxBackgroundMode=" outline"

app:boxStrokeColor="@and roid:color/black">

<com.google.android.mater ial.textfield.TextInputEdit Text

android:id="@+id/etInput"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Enter number(s)(e.g.53)"

android:inputType="text"

/>

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</com.google.android.mater ial.textfield.TextInputLayo ut>

<!--Trigonometric Buttons -->

<LinearLayout

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:orientation="horiz ontal"

android:gravity="center"

android:paddingTop="16dp ">

<Button android:id="@+id/btnSin" android:layout\_width="wra p\_content" android:layout\_height="wr ap\_content"android:text="sin" />

<Button android:id="@+id/btnCos" android:layout\_width="wra p\_content"

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android:layout\_height="wr ap\_content"android:text="cos" />

<Button android:id="@+id/btnTan" android:layout\_width="wra p\_content" android:layout\_height="wr ap\_content"android:text="tan" />

</LinearLayout>

<!-- Arithmetic Buttons -->

<LinearLayout

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:orientation="horiz ontal"

android:gravity="center"

android:paddingTop="8dp"

>

<Button android:id="@+id/btnAdd" android:layout\_width="wra

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p\_content" android:layout\_height="wr ap\_content"android:text="+" />

<Button android:id="@+id/btnSubtr act"android:layout\_width="wra p\_content" android:layout\_height="wr ap\_content" android:text="- " />

<Button android:id="@+id/btnMulti ply"android:layout\_width="wra p\_content" android:layout\_height="wr ap\_content"android:text="\*" />

<Button android:id="@+id/btnDivid e"android:layout\_width="wra p\_content" android:layout\_height="wr ap\_content"android:text="/" />

</LinearLayout>

-->

<!--ScientificButtons

<LinearLayout

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android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:orientation="horiz ontal"

android:gravity="center"

android:paddingTop="8dp"

>

<Button android:id="@+id/btnSqrt" android:layout\_width="wra p\_content" android:layout\_height="wr ap\_content"android:text="√" />

<Button android:id="@+id/btnPow" android:layout\_width="wra p\_content" android:layout\_height="wr ap\_content"android:text="^" />

<Button android:id="@+id/btnLog" android:layout\_width="wra p\_content"

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android:layout\_height="wr ap\_content"android:text="ln" />

<Button android:id="@+id/btnMod" android:layout\_width="wra p\_content" android:layout\_height="wr ap\_content"android:text="%" />

</LinearLayout>

<!--ResultDisplay-->

<TextView android:id="@+id/tvResult"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="Result:" android:textSize="24sp" android:gravity="center"

android:paddingTop="24dp" />

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</LinearLayout>

</ScrollView>

## MainActivity.kt

packagecom.example.ex2

import androidx.appcompat.app.AppCompatActivity

import android.os.Bundle import android.widget.\* import kotlin.math.\*

class MainActivity : AppCompatActivity() {

override fun onCreate(savedInstanceSta te: Bundle?) {

super.onCreate(savedInstanceState)

setContentView(R.layout.*a ctivity\_main*)

val etInput = findViewById<EditText>(R

.id.*etInput*)

val tvResult = findViewById<TextView>(

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R.id.*tvResult*)

val btnAdd = findViewById<Button>(R.i d.*btnAdd*)

val btnSubtract = findViewById<Button>(R.i d.*btnSubtract*)

val btnMultiply = findViewById<Button>(R.i d.*btnMultiply*)

val btnDivide = findViewById<Button>(R.i d.*btnDivide*)

val btnSin = findViewById<Button>(R.i d.*btnSin*)

val btnCos = findViewById<Button>(R.i d.*btnCos*)

val btnTan = findViewById<Button>(R.i d.*btnTan*)

val btnSqrt = findViewById<Button>(R.i d.*btnSqrt*)

val btnPow = findViewById<Button>(R.i d.*btnPow*)

val btnLog = findViewById<Button>(R.i d.*btnLog*)

valbtnMod=

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findViewById<Button>(R.i d.*btnMod*)

btnAdd.setOnClickListener

**{**

calculateTwoInputs("+",etInput, tvResult)

**}**

btnSubtract.setOnClickLis tener **{**

calculateTwoInputs("-", etInput, tvResult)

**}**

btnMultiply.setOnClickList ener **{**

calculateTwoInputs("\*",etInput, tvResult)

**}**

btnDivide.setOnClickListe ner **{**

calculateTwoInputs("/", etInput, tvResult)

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**}**

btnSin.setOnClickListener

**{**

val input = etInput.*text*.toString().*toDoubleOrNull*()

input?.*let***{**

valresult=

*sin*(Math.toRadians(**it**))

tvResult.*text*= "Result: $result"

**}**?:showError()

**}**

btnCos.setOnClickListener

**{**

val input = etInput.*text*.toString().*toDoubleOrNull*()

input?.*let***{**

valresult=

*cos*(Math.toRadians(**it**))

tvResult.*text*= "Result: $result"

**}**?:showError()

**}**

btnTan.setOnClickListener

**{**

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val input = etInput.*text*.toString().*toDoubleOrNull*()

input?.*let***{**

valresult=

*tan*(Math.toRadians(**it**))

tvResult.*text*= "Result: $result"

**}**?:showError()

**}**

btnSqrt.setOnClickListene r **{**

val input = etInput.*text*.toString().*toDoubleOrNull*()

input?.*let***{**

if (**it** >= 0) { val result =

*sqrt*(**it**)

tvResult.*text*=

"Result:$result"

}else{

tvResult.*text*= "Error:Negativenumber!"

}

**}**?:showError()

**}**

btnPow.setOnClickListener

**{**

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calculateTwoInputs("^",etInput, tvResult)

**}**

btnLog.setOnClickListener

**{**

val input = etInput.*text*.toString().*toDoubleOrNull*()

input?.*let***{**

if (**it** > 0) {val result =

*ln*(**it**)

tvResult.*text*=

"Result:$result"

}else{

tvResult.*text* = "Error:Inputmust be>0!"

}

**}**?:showError()

**}**

btnMod.setOnClickListene r **{**

calculateTwoInputs("%", etInput, tvResult)

**}**

}

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private fun calculateTwoInputs(operati on: String, etInput:EditText, tvResult: TextView) {

val inputText = etInput.*text*.toString()

valnumbers= inputText.*split*("")

if(numbers.size!=2) { tvResult.*text* =

"Enter two numbers separated by space."return

}

val a = numbers[0].*toDoubleOrNul l*()

val b = numbers[1].*toDoubleOrNul l*()

if (a == null ||b == null) {

showError() return

}

val result = when (operation) {

"+" -> a + b "-" -> a - b

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"\*"->a\*b

"/" -> if (b != 0.0) a / b else "Error: Divide byzero"

"^"->a.*pow*(b) "%" -> a % b

else ->"Unknown operation"

}

tvResult.*text*= "Result: $result"

}

privatefunshowError(){ Toast.makeText(this,

"Invalid input!", Toast.*LENGTH\_SHORT*).s

how()

}

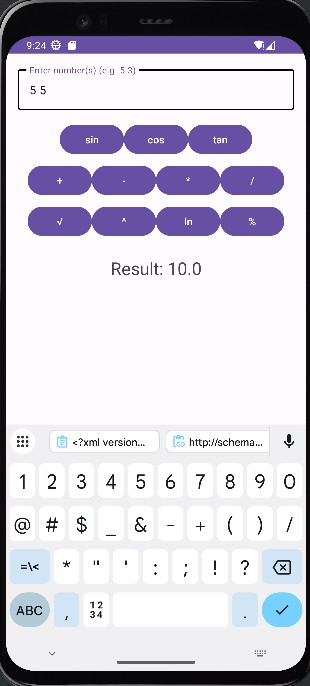
}

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***Output:***



# Result:

TheApplicationwasdevelopedusing KotlininAndroidStudio.

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