RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR, THANDALAM – 602 105

RAJALAKSHMI
ENGINEERING COLLEGE

CS19611
Mobile Application Development Laboratory

Laboratory Record Note Book

Name : . . . . . THARUN M. . . . . .

Year / Branch / Section : . . . . . .III / CSE / D. . . . . .

Register No. : . . . . . .2116220701301 . . . . . .

Semester : . . . . . .VI . . . . . .

Academic Year : . . . . . .2024 - 2025. . . . . .

RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR, THANDALAM – 602 105

BONAFIDE CERTIFICATE

Name : . . . . . THARUN M. . . . . .

Academic Year : . . . . . .2024-2025 . . . . Semester : . . . VI. . . . . Branch : . . .CSE. . . .

Register No.	2116220701301

Certified that this is the bonafide record of work done by the above student in the

. . . . . Mobile Application Development . . . . . Laboratory during the year

2024 - 2025

Signature of Faculty in-charge

Submitted for the Practical Examination held on . . . . . .

Internal Examiner External Examiner

INDEX

Reg. No. : 220701301 Name : THARUN M

Year : 2024-2025 Branch : CSE Sec : D

Ex. No. : 01 Date : 28/3/25

Register No. : 220701301 Name : THARUN M

GUI Components

Aim

Develop an application to change the font and color of the text and display toast message when the user presses the button.

Procedure

1. Create a new Kotlin project.

2. Set the project type to Kotlin/JVM if applicable.

3. Create a src directory inside the project (if not already created).

4. Create a new Kotlin file (e.g., Experiment.kt) inside src.

5. Add the main function to serve as the entry point:

6. Build your experiment logic: write functions, classes, and operations you want to test.

7. Run the program using the Run option or terminal command.

8. Analyze the output, make changes as needed, and repeat if necessary.

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:supportsRtl="true"
        android:theme="@style/Theme.GUIComponents"
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>
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:id="@+id/linearLayout"     android:layout_width="match_parent"     android:layout_height="match_parent"
android:orientation="vertical"     tools:context=".MainActivity" >

   <TextView         android:id="@+id/tvText"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:text="Rajalakshmi
Engineering College"         android:textAlignment="center"
android:textSize="16sp" />

   <Button         android:id="@+id/btFontSize"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:inputType="textCapSentences"         android:text="Change Font Size"
android:textSize="16sp" />

   <Button
      android:id="@+id/btFontColor"         android:layout_width="match_parent"
android:layout_height="wrap_content"
android:inputType="textCapSentences"         android:text="Change Font Color"
android:textSize="16sp" />

   <Button
      android:id="@+id/btBackgroundColor"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:inputType="textCapSentences"         android:text="Change Background
Color"         android:textSize="16sp" />  </LinearLayout>
```

MainActivity.kt

```
package org.rajalakshmi.guicomponents

import android.graphics.Color
import androidx.appcompat.app.AppCompatActivity import
android.os.Bundle import android.widget.Button import android.widget.LinearLayout
import android.widget.TextView

class MainActivity : AppCompatActivity() {      override fun onCreate(savedInstanceState:
Bundle?) {         super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
        val tvText : TextView = findViewById(R.id.tvText)         val btFontSize : Button =
findViewById(R.id.btFontSize)         val btFontColor : Button = findViewById(R.id.btFontColor)         val
btBackgroundColor : Button = findViewById(R.id.btBackgroundColor)         val linearLayout : LinearLayout =
findViewById(R.id.linearLayout)
```

```
        var fontSize : Float = 5f        var fontColor : Int = 0
var backgroundColor : Int = 0
btFontSize.setOnClickListener {
tvText.setTextSize(fontSize)            fontSize = (fontSize + 5) % 50
      }        btFontColor.setOnClickListener {            when(fontColor
% 3) {
0  -> tvText.setTextColor(Color.RED)
1  -> tvText.setTextColor(Color.GREEN)              2 -> tvText.setTextColor(Color.BLUE)
         }
         fontColor++
      }        btBackgroundColor.setOnClickListener {            when(backgroundColor
% 3) {
0  -> linearLayout.setBackgroundColor(Color.RED)
1  -> linearLayout.setBackgroundColor(Color.GREEN)              2 -> linearLayout.setBackgroundColor(Color.BLUE)
         }
         backgroundColor++
      }
   } }
```

Output

Result

The Program has been executed successfully and the output has been verified.

Ex. No. : 02 Date : 28/3/25

Register No. : 220701301 Name : THARUN M

Simple Calculator

Aim

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

Procedure

1. Create a new Kotlin project.
2. Set the project type to Kotlin/JVM if applicable.
3. Create a src directory inside the project (if not already created).
4. Create a new Kotlin file (e.g., Experiment.kt) inside src.
5. Add the main function to serve as the entry point:
6. Build your experiment logic: write functions, classes, and operations you want to test.
7. Run the program using the Run option or terminal command.
8. Analyze the output, make changes as needed, and repeat if necessary.

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:supportsRtl="true"
        android:theme="@style/Theme.SimpleCalculator"
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>
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
tools:context=".MainActivity">

   <TextView
      android:id="@+id/tvExpression"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:textSize="60sp" />

   <TextView         android:id="@+id/tvResult"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:textSize="60sp" />

   <LinearLayout         android:layout_width="match_parent"
android:layout_height="50dp"
android:orientation="horizontal">

      <Button
         android:id="@+id/btSeven"
android:layout_width="wrap_content"
android:layout_height="wrap_content"            android:layout_weight="1"
android:text="7" />

      <Button
         android:id="@+id/btEight"
android:layout_width="wrap_content"
android:layout_height="wrap_content"            android:layout_weight="1"
android:text="8" />

      <Button
         android:id="@+id/btNine"            android:layout_width="wrap_content"
android:layout_height="wrap_content"            android:layout_weight="1"
android:text="9" />

      <Button
         android:id="@+id/btDivision"
android:layout_width="wrap_content"
android:layout_height="wrap_content"            android:layout_weight="1"
android:text="/" />
   </LinearLayout>

   <LinearLayout         android:layout_width="match_parent"
android:layout_height="50dp"
android:orientation="horizontal">        <Button
android:id="@+id/btFour"            android:layout_width="wrap_content"
android:layout_height="wrap_content"            android:layout_weight="1"
android:text="4" />
```

```
    <Button          android:id="@+id/btFive"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:layout_weight="1"
android:text="5" />        <Button          android:id="@+id/btSix"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:layout_weight="1"
android:text="6" />

    <Button
       android:id="@+id/btMultiplication"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:layout_weight="1"
android:text="X" />
  </LinearLayout>

  <LinearLayout        android:layout_width="match_parent"
android:layout_height="50dp"
android:orientation="horizontal">

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

    <Button          android:id="@+id/btTwo"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:layout_weight="1"
android:text="2" />

    <Button
       android:id="@+id/btThree"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:layout_weight="1"
android:text="3" />

    <Button
       android:id="@+id/btSubtraction"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:layout_weight="1"
android:text="-" />
  </LinearLayout>

  <LinearLayout        android:layout_width="match_parent"
android:layout_height="50dp"
android:orientation="horizontal">

    <Button
       android:id="@+id/btDecimal"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:layout_weight="1"
android:text="." />
```

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

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

    <Button
      android:id="@+id/btAddition"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:layout_weight="1"
android:text="+" />
  </LinearLayout>    <Button        android:id="@+id/btClear"
android:layout_width="match_parent"
android:layout_height="wrap_content"       android:text="Clear"
android:textAllCaps="false" />

</LinearLayout>
```

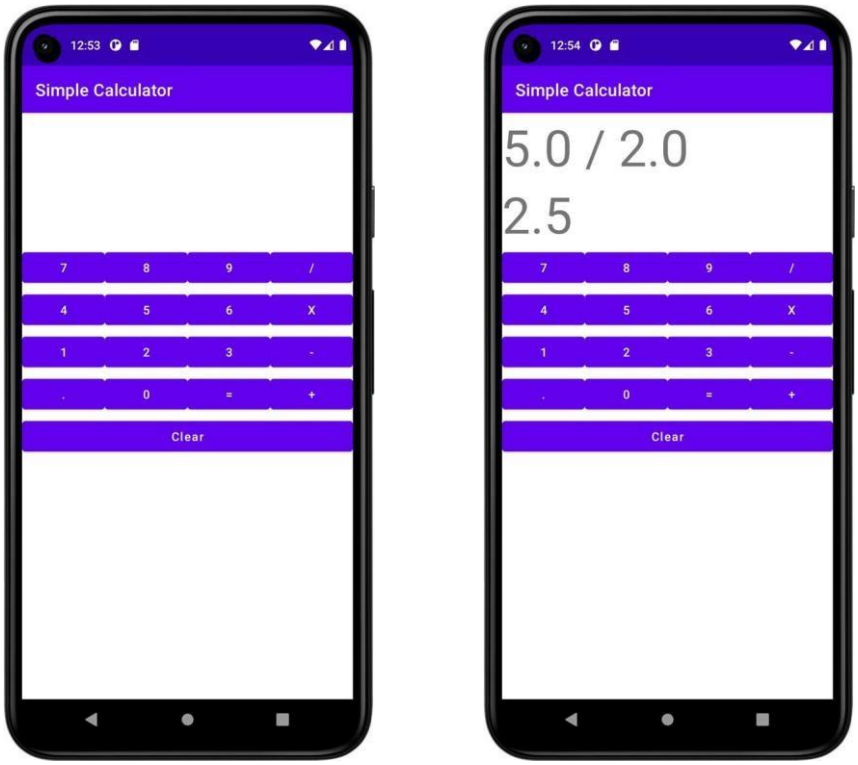
MainActivity.xml

```
package org.rajalakshmi.simplecalculator

import androidx.appcompat.app.AppCompatActivity import
android.os.Bundle import android.widget.Button import android.widget.TextView

class MainActivity : AppCompatActivity() {    var input1
:Double = 0.0    var input2 :Double = 0.0    var addition :
Boolean = false    var subtraction : Boolean = false    var
multiplication : Boolean = false    var division : Boolean = false
var decimal : Boolean = false
  override fun onCreate(savedInstanceState: Bundle?) {       super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
      val tvExpression : TextView = findViewById(R.id.tvExpression)       val tvResult : TextView =
findViewById(R.id.tvResult)       val btZero : Button = findViewById(R.id.btZero)       val btOne : Button =
findViewById(R.id.btOne)       val btTwo : Button = findViewById(R.id.btTwo)       val btThree : Button =
findViewById(R.id.btThree)       val btFour : Button = findViewById(R.id.btFour)       val btFive : Button =
findViewById(R.id.btFive)       val btSix : Button = findViewById(R.id.btSix)       val btSeven : Button =
findViewById(R.id.btSeven)       val btEight : Button = findViewById(R.id.btEight)       val btNine : Button =
findViewById(R.id.btNine)       val btAddition : Button = findViewById(R.id.btAddition)       val btSubtraction
: Button = findViewById(R.id.btSubtraction)       val btMultiplication : Button =
findViewById(R.id.btMultiplication)       val btDivision : Button = findViewById(R.id.btDivision)       val
btDecimal : Button = findViewById(R.id.btDecimal)       val btEqual : Button = findViewById(R.id.btEqual)
val btClear : Button = findViewById(R.id.btClear)

    btZero.setOnClickListener {
      tvExpression.setText("${tvExpression.text}0")
    }
```

```
        btOne.setOnClickListener {
            tvExpression.setText("${tvExpression.text}1")
        }
        btTwo.setOnClickListener {
            tvExpression.setText("${tvExpression.text}2")
        }
        btThree.setOnClickListener {
            tvExpression.setText("${tvExpression.text}3")
        }
        btFour.setOnClickListener {
            tvExpression.setText("${tvExpression.text}4")
        }
        btFive.setOnClickListener {
            tvExpression.setText("${tvExpression.text}5")
        }
        btSix.setOnClickListener {
            tvExpression.setText("${tvExpression.text}6")
        }
        btSeven.setOnClickListener {
            tvExpression.setText("${tvExpression.text}7")
        }
        btEight.setOnClickListener {
            tvExpression.setText("${tvExpression.text}8")
        }
        btNine.setOnClickListener {
            tvExpression.setText("${tvExpression.text}9")
        }
        btDecimal.setOnClickListener {            if(!decimal) {
                tvExpression.setText("${tvExpression.text}.")                decimal = true
            }        }
        btAddition.setOnClickListener {            if (tvExpression.getText().length != 0) {
input1 = "${tvExpression.text}".toDouble()                addition = true                decimal
= false                tvExpression.setText(null)
            }        }
        btSubtraction.setOnClickListener {            if (tvExpression.getText().length != 0) {
input1 = "${tvExpression.text}".toDouble()                subtraction = true
decimal = false                tvExpression.setText(null)
            }        }
        btMultiplication.setOnClickListener {            if (tvExpression.getText().length != 0)
{                input1 = "${tvExpression.text}".toDouble()                multiplication = true
decimal = false                tvExpression.setText(null)
            }        }
        btDivision.setOnClickListener {            if (tvExpression.getText().length != 0) {
input1 = "${tvExpression.text}".toDouble()                division = true
decimal = false                tvExpression.setText(null)
            }        }
        btEqual.setOnClickListener() {            input2 = "${tvExpression.text}".toDouble()
if (addition) {                tvExpression.setText("${input1} + ${input2}")                val
raddition : Double = input1 + input2                tvResult.setText("${raddition}")
addition = false
            }            if (subtraction) {
                tvExpression.setText("${input1} - ${input2}")                val rsubtraction : Double =
input1 - input2                tvResult.setText("${rsubtraction}")                subtraction = false
            }
```

```
        if (multiplication) {
            tvExpression.setText("${input1} * ${input2}")            val rmultiplication : Double
= input1 * input2            tvResult.setText("${rmultiplication}")            multiplication =
false
        }        if (division) {
            tvExpression.setText("${input1} / ${input2}")            val rdivision : Double =
input1 / input2            tvResult.setText("${rdivision}")            division = false
        }
    }                        btClear.setOnClickListener    {
tvExpression.setText("")        tvResult.setText("")        input1
= 0.0        input2 = 0.0        decimal = false
    }
  }
}
```

Output



Result:

The Program has been executed successfully and the output has been verified.

Ex. No. : 03 Date : 28/3/25

Register No. : 220701301 Name : THARUN M

Graphical Primitives

Aim

Develop an android application to draw the circle, ellipse, rectangle and some text using Android Graphical primitives.

Procedure

1. Create a new Kotlin project.

2. Set the project type to Kotlin/JVM if applicable.

3. Create a src directory inside the project (if not already created).

4. Create a new Kotlin file (e.g., Experiment.kt) inside src.

5. Add the main function to serve as the entry point:

6. Build your experiment logic: write functions, classes, and operations you want to test.

7. Run the program using the Run option or terminal command.

8. Analyze the output, make changes as needed, and repeat if necessary.

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:supportsRtl="true"
        android:theme="@style/Theme.GraphicalPrimitives"        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>
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?> <androidx.constraintlayout.widget.ConstraintLayout
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"     tools:context=".MainActivity">

    <org.rajalakshmi.graphicalprimitives.SampleCanvas         android:layout_width="match_parent"
android:layout_height="match_parent">      </org.rajalakshmi.graphicalprimitives.SampleCanvas>
</androidx.constraintlayout.widget.ConstraintLayout>
```

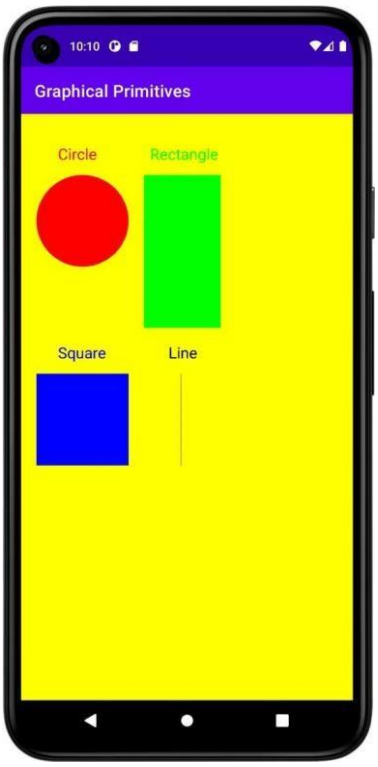
MainActivity.kt

```
package org.rajalakshmi.graphicalprimitives

import androidx.appcompat.app.AppCompatActivity import android.os.Bundle

class MainActivity : AppCompatActivity() {    override fun
onCreate(savedInstanceState: Bundle?) {        super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
    }
}
```

SampleCanvas.kt

```
package org.rajalakshmi.graphicalprimitives

import android.content.Context import
android.graphics.Canvas import
android.graphics.Color import android.graphics.Paint
import android.util.AttributeSet import
android.view.View

class SampleCanvas @JvmOverloads constructor(      context: Context, attrs: AttributeSet? = null,
defStyleAttr: Int = 0 ) : View(context, attrs, defStyleAttr) {

   override fun onDraw(canvas: Canvas?) {        super.onDraw(canvas)
val paint : Paint = Paint()
paint.setColor(Color.YELLOW)
canvas?.drawPaint(paint)        paint.setTextSize(50f);
paint.setColor(Color.RED);
      canvas?.drawText("Circle", 120f, 150f, paint);        canvas?.drawCircle(200f, 350f, 150f, paint);
paint.setColor(Color.GREEN);
      canvas?.drawText("Rectangle", 420f, 150f, paint);        canvas?.drawRect(400f, 200f, 650f, 700f, paint);
paint.setColor(Color.BLUE);
      canvas?.drawText("Square", 120f, 800f, paint);        canvas?.drawRect(50f, 850f, 350f, 1150f, paint);
paint.setColor(Color.BLACK);
      canvas?.drawText("Line", 480f, 800f, paint);        canvas?.drawLine(520f, 850f, 520f, 1150f, paint);

   }
}
```

Output


10:10
Graphical Primitives
Circle
Rectangle
Square
Line

Result

The Program has been executed successfully and the output has been verified.

Ex. No. : 04 Date : 3/4/25

Register No. : 220701301 Name : THARUN M

Android Fragments

Aim

Develop an android application to create two activities named as Student Basic Details (Register No., Name, Department) and Student Mark Details (SSLC, HSC, UG). Write an android code to combine these two activities in single screen using android fragment.

Procedure

1. Create a new Kotlin project.

2. Set the project type to Kotlin/JVM if applicable.

3. Create a src directory inside the project (if not already created).

4. Create a new Kotlin file (e.g., Experiment.kt) inside src.

5. Add the main function to serve as the entry point:

6. Build your experiment logic: write functions, classes, and operations you want to test.

7. Run the program using the Run option or terminal command.

8. Analyze the output, make changes as needed, and repeat if necessary.

?>

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:supportsRtl="true"
      android:theme="@style/Theme.AndroidFragments"        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>
```

?>

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"
<LinearLayout 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:orientation="vertical"     tools:context=".MainActivity">

   <TextView
      android:id="@+id/tvTitle"        android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Student Details"
android:textAlignment="center"        android:textSize="24sp" />

   <LinearLayout
android:layout_width="match_parent"
android:layout_height="match_parent"        android:orientation="vertical">

      <fragment
         android:id="@+id/fragmentBasic"
         android:name="org.rajalakshmi.androidfragments.StudentBasicDetails"
android:layout_width="match_parent"           android:layout_height="300dp" />

      <fragment
         android:id="@+id/fragmentMark"
         android:name="org.rajalakshmi.androidfragments.StudentMarkDetails"
android:layout_width="match_parent"           android:layout_height="300dp" />

   </LinearLayout>  </LinearLayout>
```

fragment_student_basic_details.xml

```
<?xml version="1.0" encoding="utf-8"
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"     android:layout_width="match_parent"
android:layout_height="match_parent"     tools:context=".StudentBasicDetails">
   <TextView
      android:id="@+id/tvBasicDetails"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Basic Details"
android:textAlignment="center"        android:textSize="24sp" />
   <TextView
      android:id="@+id/tvRegisterNumber"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:layout_marginTop="50dp"
android:text="Register No." />
   <EditText
      android:id="@+id/etRegisterNumber"
```

```
?>


android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="150dp"
android:layout_marginTop="50dp"        android:ems="10"
android:hint="Register Number"
android:inputType="textPersonName" />
   <TextView         android:id="@+id/tvName"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="125dp"        android:text="Name"
/>
   <EditText
      android:id="@+id/etName"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="150dp"
android:layout_marginTop="125dp"        android:ems="10"
android:hint="Name"
      android:inputType="textPersonName" />
   <TextView
      android:id="@+id/tvDepartment"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:layout_marginTop="200dp"
android:text="Department" />
   <EditText
      android:id="@+id/etDepartment"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="150dp"
android:layout_marginTop="200dp"        android:ems="10"
android:hint="Department"
      android:inputType="textPersonName" />
</FrameLayout>
```

fragment_student_mark_details.xml

```
<?xml version="1.0" encoding="utf-8"
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"     android:layout_width="match_parent"
android:layout_height="match_parent"     tools:context=".StudentMarkDetails">
   <TextView
      android:id="@+id/tvBasicDetails"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Mark Details"
android:textAlignment="center"        android:textSize="24sp" />
   <TextView         android:id="@+id/tvSSLC"
android:layout_width="wrap_content"
android:layout_height="wrap_content"        android:layout_marginTop="50dp"
android:text="S.S.L.C." />
   <EditText
      android:id="@+id/etSSLC"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="150dp"
```

```
?>


android:layout_marginTop="50dp"        android:ems="10"
android:hint="S.S.L.C. Mark"
android:inputType="textPersonName" />
   <TextView         android:id="@+id/tvHSc"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="125dp"        android:text="H.Sc." />
   <EditText
      android:id="@+id/etHSC"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
```



```
android:layout_marginLeft="150dp"
android:layout_marginTop="125dp"        android:ems="10"
android:hint="H.Sc. Mark"
      android:inputType="textPersonName" />
   <TextView         android:id="@+id/tvUG"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="200dp"        android:text="U.G." />
   <EditText
      android:id="@+id/etUG"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginLeft="150dp"
android:layout_marginTop="200dp"        android:ems="10"
android:hint="U.G. C.G.P.A."
android:inputType="textPersonName" />
</FrameLayout>
```

org.rajalakshmi.androidfragments

MainActivity.kt

```
package

import androidx.appcompat.app.AppCompatActivity import android.os.Bundle

class MainActivity : AppCompatActivity() {    override fun
onCreate(savedInstanceState: Bundle?) {        super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
    }
}
```

StudentBasicDetails.kt

```
package
import android.os.Bundle import
androidx.fragment.app.Fragment                    import
android.view.LayoutInflater  import  android.view.View
import android.view.ViewGroup
// TODO: Rename parameter arguments, choose names that match
// the fragment initialization parameters, e.g. ARG_ITEM_NUMBER private const val
ARG_PARAM1 = "param1" private const val ARG_PARAM2 = "param2"

/**
*   A simple [Fragment] subclass.
*   Use the [StudentBasicDetails.newInstance] factory method to  * create an instance of this fragment.
 */ class StudentBasicDetails : Fragment() {
   // TODO: Rename and change types of parameters     private var param1:
String? = null     private var param2: String? = null

   override fun onCreate(savedInstanceState: Bundle?) {
super.onCreate(savedInstanceState)        arguments?.let {
         param1 = it.getString(ARG_PARAM1)          param2 =
it.getString(ARG_PARAM2)
      }
   }
   override fun onCreateView(        inflater: LayoutInflater, container:
ViewGroup?,        savedInstanceState: Bundle?
   ): View? {
      // Inflate the layout for this fragment
      return inflater.inflate(R.layout.fragment_student_basic_details, container, false)
   }
   companion object {
      /**
*   Use this factory method to create a new instance of  * this fragment using the provided parameters.
       *
*   @param param1 Parameter 1.
*   @param param2 Parameter 2.
*   @return A new instance of fragment StudentBasicDetails.
       */
      // TODO: Rename and change types and number of parameters
      @JvmStatic        fun newInstance(param1: String, param2: String) =
         StudentBasicDetails().apply {              arguments = Bundle().apply
{                putString(ARG_PARAM1, param1)                putString(ARG_PARAM2,
param2)
            }
         }
   } }
```

StudentMarkDetails.kt

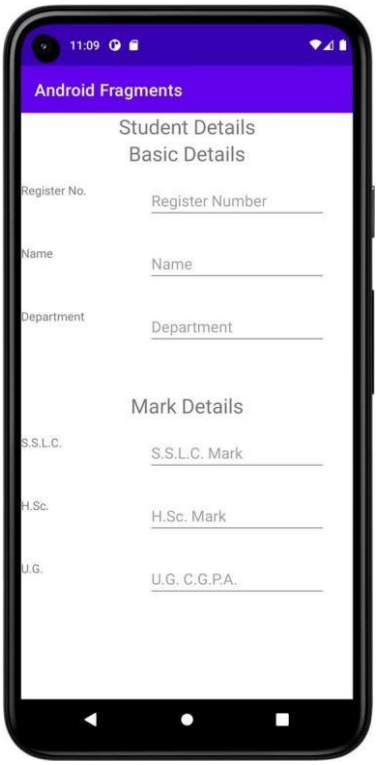
```
package
```

```
import android.os.Bundle import
androidx.fragment.app.Fragment                    import
android.view.LayoutInflater  import  android.view.View
import android.view.ViewGroup
```



```
// TODO: Rename parameter arguments, choose names that match
// the fragment initialization parameters, e.g. ARG_ITEM_NUMBER private const val
ARG_PARAM1 = "param1" private const val ARG_PARAM2 = "param2"

/**
*   A simple [Fragment] subclass.
*   Use the [StudentMarkDetails.newInstance] factory method to  * create an instance of this fragment.
 */ class StudentMarkDetails : Fragment() {
   // TODO: Rename and change types of parameters     private var param1:
String? = null     private var param2: String? = null

   override fun onCreate(savedInstanceState: Bundle?) {
super.onCreate(savedInstanceState)        arguments?.let {
         param1 = it.getString(ARG_PARAM1)           param2 =
it.getString(ARG_PARAM2)
      }
   }
   override fun onCreateView(        inflater: LayoutInflater, container: ViewGroup?,
savedInstanceState: Bundle?
   ): View? {
      // Inflate the layout for this fragment
      return inflater.inflate(R.layout.fragment_student_mark_details, container, false)
   }
   companion object {
      /**
*   Use this factory method to create a new instance of  * this fragment using the provided parameters.
       *
*   @param param1 Parameter 1.
*   @param param2 Parameter 2.
*   @return A new instance of fragment StudentMarkDetails.          */
      // TODO: Rename and change types and number of parameters
      @JvmStatic        fun newInstance(param1: String, param2: String) =
StudentMarkDetails().apply {              arguments = Bundle().apply {
putString(ARG_PARAM1, param1)                  putString(ARG_PARAM2, param2)
            }
         }
   } }
```

Output



Result

The Program has been executed successfully and the output has been verified.

Ex. No. : 05 Date : 3/4/25

Register No. : 220701301 Name : THARUN M

SQLite

Aim

Create a Database table with the following structure using SQLite: Student (Register Number, Name, CGPA). Develop an android application to perform the following operation using SQLite developer classes. 1. Insert student Details 2. Update the student Record 3. Delete a specified record. 4. View the details.

Procedure

1. Create a new Kotlin project.

2. Set the project type to Kotlin/JVM if applicable.

3. Create a src directory inside the project (if not already created).

4. Create a new Kotlin file (e.g., Experiment.kt) inside src.

5. Add the main function to serve as the entry point:

6. Build your experiment logic: write functions, classes, and operations you want to test.

7. Run the program using the Run option or terminal command.

8. Analyze the output, make changes as needed, and repeat if necessary.

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:supportsRtl="true"
android:theme="@style/Theme.SQLite"        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>
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
tools:context=".MainActivity" >

   <TextView
      android:id="@+id/tvRegisterNumber"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Register Number" />

   <EditText
      android:id="@+id/etRegisterNumber"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
      android:inputType="textPersonName" />

   <TextView         android:id="@+id/tvName"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Name" />

   <EditText         android:id="@+id/etName"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
      android:inputType="textPersonName" />

   <TextView         android:id="@+id/tvCGPA"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="CGPA" />

   <EditText         android:id="@+id/etCGPA"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
      android:inputType="textPersonName" />

   <Button         android:id="@+id/btAdd"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Add"
android:textAllCaps="false" />

   <Button         android:id="@+id/btView"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="View"
android:textAllCaps="false" />
    <Button         android:id="@+id/btModify"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Modify"
android:textAllCaps="false" />
```

```
    <Button        android:id="@+id/btDelete"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:text="Delete"        android:textAllCaps="false" />
    <Button        android:id="@+id/btClear"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Clear"
android:textAllCaps="false" />  </LinearLayout>
```

DBContract.kt

```
package org.rajalakshmi.sqlite   import
android.provider.BaseColumns

object DBContract {
   class UserEntry : BaseColumns {        companion
object {           val TABLE_NAME = "students"
          val COLUMN_REGISTER_NUMBER = "registernumber"            val
COLUMN_NAME = "name"            val COLUMN_CGPA = "cgpa"
       }
   }
}
```

UserModel.kt

```
package org.rajalakshmi.sqlite   class UserModel (val registernumber :
String, val name : String, val cgpa :  String)
```

UsersDBHelper.kt

```
package org.rajalakshmi.sqlite   import
android.annotation.SuppressLint import
android.content.ContentValues import
android.content.Context import android.database.Cursor
import android.database.sqlite.SQLiteConstraintException import
android.database.sqlite.SQLiteDatabase import android.database.sqlite.SQLiteException
import android.database.sqlite.SQLiteOpenHelper

class UsersDBHelper(context: Context) : SQLiteOpenHelper(context, DATABASE_NAME, null,
DATABASE_VERSION) {
   override fun onCreate(db: SQLiteDatabase?) {        db?.execSQL(SQL_CREATE_ENTRIES)
}     override fun onUpgrade(db: SQLiteDatabase?, oldVersion: Int, newVersion: Int) {
db?.execSQL(SQL_DELETE_ENTRIES)        onCreate(db)
   }
   @Throws(SQLiteConstraintException::class)     fun insertUser(user: UserModel):
Boolean {
      // Gets the data repository in write mode         val db = writableDatabase

      // Create a new map of values, where column names are the keys         val values = ContentValues()
values.put(DBContract.UserEntry.COLUMN_REGISTER_NUMBER, user.registernumber)
      values.put(DBContract.UserEntry.COLUMN_NAME, user.name)
values.put(DBContract.UserEntry.COLUMN_CGPA, user.cgpa)

      // Insert the new row, returning the primary key value of the new row         val newRowId =
db.insert(DBContract.UserEntry.TABLE_NAME, null, values)          return true
   }

   @SuppressLint("Range")     fun readUser(registerNumber : String):
ArrayList<UserModel> {        val users =
ArrayList<UserModel>()        val db = writableDatabase         var cursor: Cursor? = null         try {
cursor = db.rawQuery("select * from " +
DBContract.UserEntry.TABLE_NAME + " WHERE " +
DBContract.UserEntry.COLUMN_REGISTER_NUMBER + " = '" + registerNumber + "'", null)        }
catch (e: SQLiteException) {
db.execSQL(SQL_CREATE_ENTRIES)           return ArrayList()
      }         var name : String         var cgpa :
String        if
(cursor!!.moveToFirst()) {           while
(cursor.isAfterLast == false) {              name =
              cursor cursor.getString(.getColumnIndex(DBContract.UserEntry.COLUMN_NAME))              cgpa
=             cursor cursor.getString(.getColumnIndex(DBContract.UserEntry.COLUMN_CGPA))
                  users.add(UserModel(registerNumber, name, cgpa))
                   cursor    .moveToNext()

         }

      }        return users
   }

   @Throws(SQLiteConstraintException::class)     fun deleteUser(userid: String):
Boolean {        val db = writableDatabase
```

```
        val selection = DBContract.UserEntry.COLUMN_REGISTER_NUMBER + " LIKE ?"         val selectionArgs =
arrayOf(userid)
        db.delete(DBContract.UserEntry.TABLE_NAME, selection, selectionArgs)         return true
    }

    companion object {
        // If you change the database schema, you must increment the database version.
        val DATABASE_VERSION = 1          val
DATABASE_NAME = "FeedReader.db"

        private val SQL_CREATE_ENTRIES =
            "CREATE TABLE " + DBContract.UserEntry.TABLE_NAME + " (" +
                    DBContract.UserEntry.COLUMN_REGISTER_NUMBER + " TEXT PRIMARY KEY," +
                    DBContract.UserEntry.COLUMN_NAME + " TEXT," +
DBContract.UserEntry.COLUMN_CGPA + " TEXT)"         private val SQL_DELETE_ENTRIES = "DROP
TABLE IF EXISTS " +
DBContract.UserEntry.TABLE_NAME
    }
}
```

MainActivity.kt

```
package org.rajalakshmi.sqlite

import android.database.sqlite.SQLiteConstraintException import
androidx.appcompat.app.AppCompatActivity import android.os.Bundle import android.widget.Button
import android.widget.EditText import android.widget.Toast

class MainActivity : AppCompatActivity() {     lateinit var usersDBHelper : UsersDBHelper
override fun onCreate(savedInstanceState: Bundle?) {
super.onCreate(savedInstanceState)         setContentView(R.layout.activity_main)

        val etRegisterNumber : EditText = findViewById(R.id.etRegisterNumber)         val etName : EditText =
findViewById(R.id.etName)         val etCGPA : EditText = findViewById(R.id.etCGPA)         val btAdd : Button =
findViewById(R.id.btAdd)         val btView : Button = findViewById(R.id.btView)         val btModify : Button =
findViewById(R.id.btModify)         val btDelete : Button = findViewById(R.id.btDelete)         val btClear : Button
= findViewById(R.id.btClear)         usersDBHelper = UsersDBHelper(this)         btAdd.setOnClickListener {
val registerNumber : String = etRegisterNumber.text.toString()             val name : String =
etName.text.toString()             val cgpa : String = etCGPA.text.toString()
            var result = usersDBHelper.insertUser(UserModel(registernumber = registerNumber, name = name, cgpa =
cgpa))             etRegisterNumber.setText("")             etName.setText("")             etCGPA.setText("")
        }
        btView.setOnClickListener {             var users =
usersDBHelper.readUser(etRegisterNumber.text.toString())             users.forEach {
etName.setText(it.name)                 etCGPA.setText(it.cgpa)
            }
        }
        btDelete.setOnClickListener {             var registerNumber =
etRegisterNumber.text.toString()             val result =
usersDBHelper.deleteUser(registerNumber)             if(result)
                Toast.makeText(applicationContext, "User Deleted...!", Toast.LENGTH_LONG).show()
```

```
        }                       btClear.setOnClickListener    {
etRegisterNumber.setText("")            etName.setText("")
etCGPA.setText("")
        }
    }
}
```

Output

Result:

The program has been executed successfully and the output has been verified.

Ex. No. : 06 Date : 3/4/25

Register No. : 220701301 Name : THARUN M

Form Validation

Aim

Design an android activity with two text boxes where the user can enter (username and ID) and a button (validate). Validate the entered username and ID field for the following using android code. i) Both the fields should not be empty ii) Name field should have alphabets iii) ID field should have numeric values (only 4-digit).

Procedure

1. Create a new Kotlin project.

2. Set the project type to Kotlin/JVM if applicable.

3. Create a src directory inside the project (if not already created).

4. Create a new Kotlin file (e.g., Experiment.kt) inside src.

5. Add the main function to serve as the entry point:

6. Build your experiment logic: write functions, classes, and operations you want to test.

7. Run the program using the Run option or terminal command.

8. Analyze the output, make changes as needed, and repeat if necessary.

```
                    encoding="utf-8"?>
```

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:supportsRtl="true"
      android:theme="@style/Theme.FormValidation"        tools:targetApi="31">
      <activity            android:name=".MainActivity2"
android:exported="false" />
      <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>
```

activity_main.xml

```
<?xml version="1.0"
<LinearLayout 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:orientation="vertical"
tools:context=".MainActivity">

   <EditText
```


```
        android:id="@+id/etUserName"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
        android:hint="Enter the userame...!"
android:inputType="textPersonName" />

    <EditText
        android:id="@+id/etPinNumber"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
        android:hint="Enter the pin number...!"
android:inputType="textPersonName" />

    <Button
        android:id="@+id/btLogin"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Login"
android:textAllCaps="false" />

    <Button
        android:id="@+id/btClear"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Clear"
android:textAllCaps="false" /> </LinearLayout>
```

activity_main2.xml

```
<?xml version="1.0"
<LinearLayout 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:orientation="vertical"
tools:context=".MainActivity2">

    <TextView
        android:id="@+id/tvLoginSuccess"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Login
                                    encoding="utf-8"?>


Success...!"        android:textAlignment="center"
android:textSize="24sp" /> </LinearLayout>
```

MainActivity.kt

```
package org.rajalakshmi.formvalidation

import android.content.Intent
import androidx.appcompat.app.AppCompatActivity import
android.os.Bundle import android.widget.Button import android.widget.EditText
import android.widget.Toast

class MainActivity : AppCompatActivity() {      override fun onCreate(savedInstanceState:
Bundle?) {        super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
        val etUserName : EditText = findViewById(R.id.etUserName)        val etPinNumber : EditText
= findViewById(R.id.etPinNumber)        val btLogin : Button = findViewById(R.id.btLogin)
val btClear : Button = findViewById(R.id.btClear)

       btLogin.setOnClickListener {
          val checkUserName = "            val          [a-zA-Z]+      ".toRegex()
checkPinNo = "
                                                [0-9]{4}      ".toRegex()
if(checkUserName.matches(etUserName.text.toString()) &&
checkPinNo.matches(etPinNumber.text.toString()))  {
              val intent = Intent(this, MainActivity2::class.java)              startActivity(intent)
}            else {
              Toast.makeText(applicationContext, "Invalid User Name / Pin
No.",Toast.LENGTH_LONG).show()
           }
       }         btClear.setOnClickListener {
etUserName.text.clear()           etPinNumber.text.clear()
       }
   }
}
```

MainActivity2.kt

```
package org.rajalakshmi.formvalidation

import androidx.appcompat.app.AppCompatActivity import android.os.Bundle

class MainActivity2 : AppCompatActivity() {     override fun
onCreate(savedInstanceState: Bundle?) {        super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main2)
   }
}
```

Output


8:13
Form Validation
Enter the user name...!
Enter the pin number...!
Login
Clear


8:17
Form Validation
bhuvan123
1234
Login
Clear


8:18
Form Validation
bhuvan123
1234
Login
Clear
Invalid User Name / Pin No.


8:18
Form Validation
bhuvan
123
Login
Clear

Result

The Program has been executed successfully and the output has been verified.

Ex. No. : 07 Date : 3/4/25

Register No. : 220701301 Name : THARUN M

SD Card

Aim

Implement an application to write the Register Number, Name and CGPA to SD card in text file format.

Procedure

1. Create a new Kotlin project.
2. Set the project type to Kotlin/JVM if applicable.
3. Create a src directory inside the project (if not already created).
4. Create a new Kotlin file (e.g., Experiment.kt) inside src.
5. Add the main function to serve as the entry point:
6. Build your experiment logic: write functions, classes, and operations you want to test.
7. Run the program using the Run option or terminal command.
8. Analyze the output, make changes as needed, and repeat if necessary.

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">
   <uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE"/>    <uses-permission
android:name="android.permission.READ_EXTERNAL_STORAGE"/>
   <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:supportsRtl="true"
android:theme="@style/Theme.SDCard"        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>
```

activity_main.xml

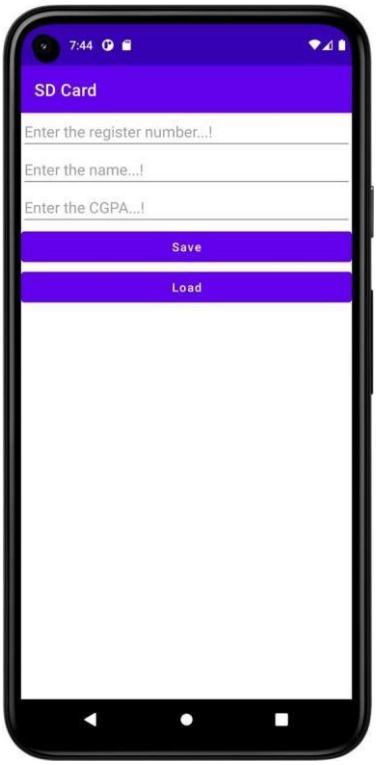
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"     xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"     android:layout_height="match_parent"     android:orientation="vertical"
tools:context=".MainActivity">

   <EditText
      android:id="@+id/etRegisterNumber"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
      android:hint="Enter the register number...!"
android:inputType="textPersonName" />

   <EditText        android:id="@+id/etName"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
      android:hint="Enter the name...!"
android:inputType="textPersonName" />

   <EditText        android:id="@+id/etCGPA"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
      android:hint="Enter the CGPA...!"
android:inputType="textPersonName" />

   <Button        android:id="@+id/btSave"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Save"
android:textAllCaps="false" />

   <Button        android:id="@+id/btLoad"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Load"
      android:textAllCaps="false" /> </LinearLayout>
```

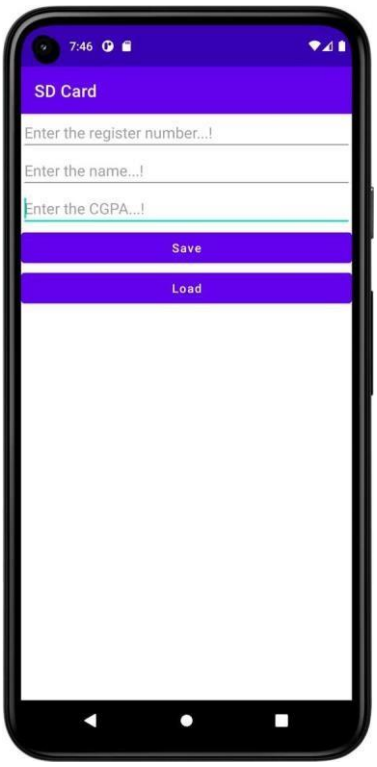
MainActivity.kt

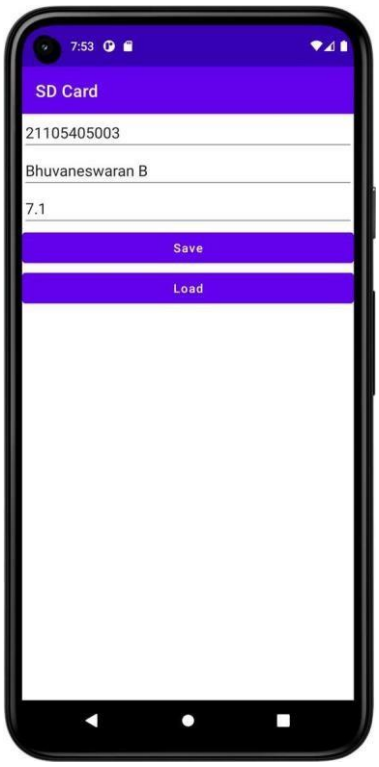
```
package org.rajalakshmi.sdcard

import androidx.appcompat.app.AppCompatActivity import
android.os.Bundle import android.widget.Button import android.widget.EditText
import java.io.*

class MainActivity : AppCompatActivity() {     override fun onCreate(savedInstanceState:
Bundle?) {        super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)

      val etRegisterNumber : EditText = findViewById(R.id.etRegisterNumber)        val etName : EditText =
```

```
findViewById(R.id.etName)        val etCGPA : EditText = findViewById(R.id.etCGPA)        val btSave : Button
= findViewById(R.id.btSave)        val btLoad : Button = findViewById(R.id.btLoad)

      btSave.setOnClickListener {            val registerNumber =
etRegisterNumber.text.toString()           val name =
etName.text.toString()           val cgpa = etCGPA.text.toString()

         val file = File(getExternalFilesDir(null), "student.txt")                  val outputStream =
FileOutputStream(file, false)           outputStream.write("$registerNumber,$name,$cgpa\n".toByteArray())
outputStream.close()

         etRegisterNumber.text.clear()          etName.text.clear()
etCGPA.text.clear()
      }
      btLoad.setOnClickListener {            val file = File(getExternalFilesDir(null),
"student.txt")           val inputStream = FileInputStream(file)            val inputStreamReader =
InputStreamReader(inputStream)           val bufferedReader =
BufferedReader(inputStreamReader)           var line: String           line =
bufferedReader.readLine()           val parts =
line.split(",")           etRegisterNumber.setText(parts[0])
etName.setText(parts[1])           etCGPA.setText(parts[2])           inputStream.close()
      }
   } }
```

Output







Result

The Program has been executed successfully and the output has been verified.

Ex. No. : 08 Date : 9/4/25

Register No. : 220701301 Name : THARUN M

Alert Dialog Box

Aim

Implement an application to display the alert box message.

Procedure

1. Create a new Kotlin project.
2. Set the project type to Kotlin/JVM if applicable.
3. Create a src directory inside the project (if not already created).
4. Create a new Kotlin file (e.g., Experiment.kt) inside src.
5. Add the main function to serve as the entry point:
6. Build your experiment logic: write functions, classes, and operations you want to test.
7. Run the program using the Run option or terminal command.
8. Analyze the output, make changes as needed, and repeat if necessary.

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:supportsRtl="true"
        android:theme="@style/Theme.AlertDialogBox"
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>
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
tools:context=".MainActivity">

   <EditText         android:id="@+id/etText"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:ems="10"
      android:hint="Enter the text...!"         android:inputType="textPersonName"
/>

   <Button         android:id="@+id/btDisplay"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:text="Display"
android:textAllCaps="false" />  </LinearLayout>
```

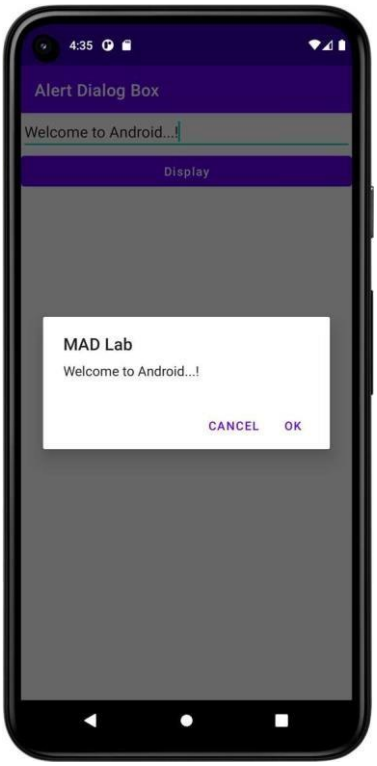
MainActivity.kt

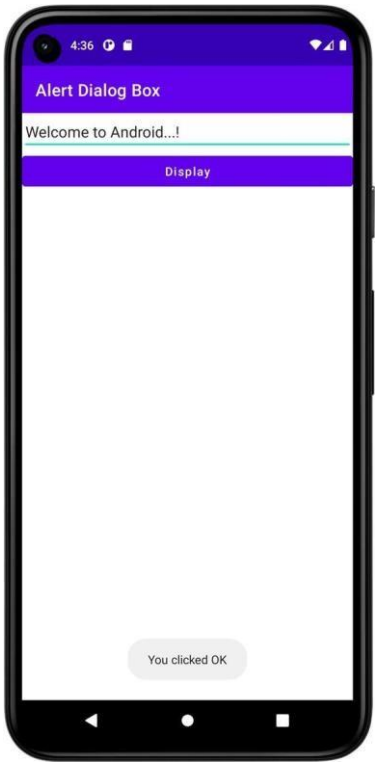
```
package org.rajalakshmi.alertdialogbox

import androidx.appcompat.app.AppCompatActivity import
android.os.Bundle import android.widget.Button import android.widget.EditText
import android.widget.Toast
import androidx.appcompat.app.AlertDialog

class MainActivity : AppCompatActivity() {      override fun onCreate(savedInstanceState:
Bundle?) {        super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
        val etText : EditText = findViewById(R.id.etText)        val btDisplay : Button =
findViewById(R.id.btDisplay)

       btDisplay.setOnClickListener {
          val alertDialog = AlertDialog.Builder(this)
             .setTitle("MAD Lab")
             .setMessage(etText.text.toString())
             .setPositiveButton("OK") { dialog, which ->
                Toast.makeText(applicationContext, "You clicked OK", Toast.LENGTH_LONG).show()
             }
             .setNegativeButton("Cancel") { dialog, which ->
                Toast.makeText(applicationContext, "You clicked Cancel",
Toast.LENGTH_LONG).show()               }
.create()           alertDialog.show()
       }
    }
}
```

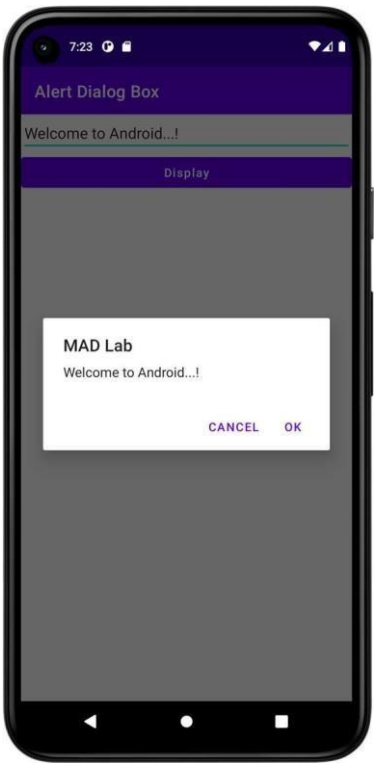
Output

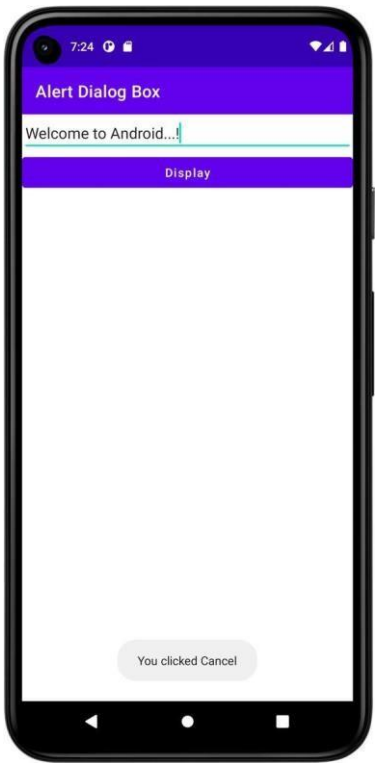

4:34
Alert Dialog Box
Enter the text...!
Display


4:35
Alert Dialog Box
Welcome to Android...!
Display


4:35
Alert Dialog Box
Welcome to Android...!
Display
MAD Lab
Welcome to Android...!
CANCEL
OK


4:36
Alert Dialog Box
Welcome to Android...!
Display
You clicked OK


7:23
Alert Dialog Box
Welcome to Android...!
Display
MAD Lab
Welcome to Android...!
CANCEL
OK


7:24
Alert Dialog Box
Welcome to Android...!
Display
You clicked Cancel

Result

The Program has been executed successfully and the output has been verified.

Ex. No. : 09 Date : 16/4/25

Register No. : 220701301 Name : THARUN M

Alarm

Aim

Write a mobile application to set the alarm using android Alarm Manager class.

Procedure

1. Create a new Kotlin project.

2. Set the project type to Kotlin/JVM if applicable.

3. Create a src directory inside the project (if not already created).

4. Create a new Kotlin file (e.g., Experiment.kt) inside src.

5. Add the main function to serve as the entry point:

6. Build your experiment logic: write functions, classes, and operations you want to test.

7. Run the program using the Run option or terminal command.

8. Analyze the output, make changes as needed, and repeat if necessary.

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">
   <uses-permission android:name="android.permission.SCHEDULE_EXACT_ALARM"/>
   <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:supportsRtl="true"
      android:theme="@style/Theme.MyApplication"
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>
      <receiver android:name=".AlarmReceiver">
```

```
    </receiver>
  </application>

</manifest>
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
tools:context=".MainActivity">

  <TimePicker
    android:id="@+id/timePicker"       android:layout_width="match_parent"
android:layout_height="wrap_content"       android:layout_gravity="center" />

  <Button
    android:id="@+id/btSetAlarm"
android:layout_width="match_parent"
android:layout_height="wrap_content"       android:text="Set Alarm"
android:textAllCaps="false" />

  <Button
    android:id="@+id/btnStopAlarm"
android:layout_width="match_parent"
android:layout_height="wrap_content"       android:text="Stop Alarm"
android:textAllCaps="false" />

</LinearLayout>
```

MainActivity.kt

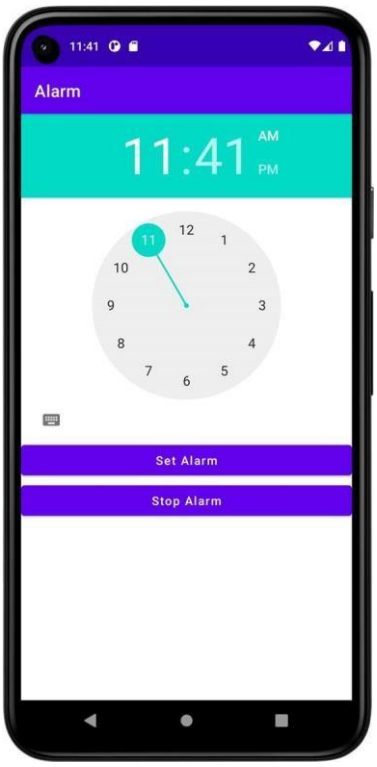
```
package org.rajalakshmi.myapplication

import android.app.AlarmManager import
android.app.PendingIntent import android.content.Intent
import androidx.appcompat.app.AppCompatActivity import
android.os.Bundle import android.widget.Button import
android.widget.TimePicker import android.widget.Toast import java.util.*

class MainActivity : AppCompatActivity() {    lateinit var pendingIntent: PendingIntent
private lateinit var alarmManager: AlarmManager    override fun
onCreate(savedInstanceState: Bundle?) {       super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)

    val alarmTimePicker: TimePicker = findViewById(R.id.timePicker)       val btSetAlarm : Button =
```

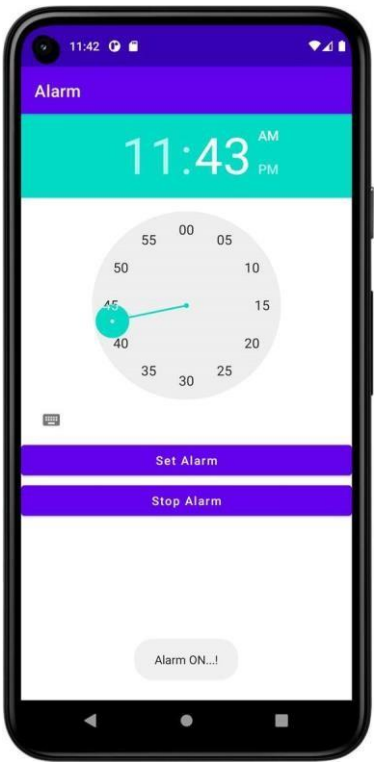
```
findViewById(R.id.btSetAlarm)        val btStopAlarm : Button = findViewById(R.id.btnStopAlarm)
alarmManager = getSystemService(ALARM_SERVICE) as AlarmManager
btSetAlarm.setOnClickListener {
          Toast.makeText(applicationContext, "Alarm ON...!", Toast.LENGTH_LONG).show()
val calendar: Calendar = Calendar.getInstance()
calendar.set(Calendar.HOUR_OF_DAY, alarmTimePicker.hour)
calendar.set(Calendar.MINUTE, alarmTimePicker.minute)            val intent = Intent(this,
AlarmReceiver::class.java)            pendingIntent =
PendingIntent.getBroadcast(this.applicationContext,
2, intent, PendingIntent.FLAG_CANCEL_CURRENT)
          val time:Long = calendar.timeInMillis - (calendar.timeInMillis %
60000)            alarmManager.setRepeating(AlarmManager.RTC_WAKEUP, time, 10000,
pendingIntent)
       }          btStopAlarm.setOnClickListener {            alarmManager.cancel(pendingIntent)
          Toast.makeText(applicationContext, "Alarm OFF...!",
Toast.LENGTH_LONG).show()
       }
   } }
```

AlarmReceiver.kt

```
package org.rajalakshmi.myapplication

import android.content.BroadcastReceiver import
android.content.Context import android.content.Intent import
android.media.Ringtone import
android.media.RingtoneManager import android.net.Uri import
android.widget.Toast
 class AlarmReceiver : BroadcastReceiver() {

    override fun onReceive(context: Context?, intent: Intent?) {
       Toast.makeText(context, "Alarm Ringing...!", Toast.LENGTH_LONG).show()        var ringtone: Ringtone
val alarmUri: Uri =
RingtoneManager.getDefaultUri(RingtoneManager.TYPE_ALARM)        ringtone =
RingtoneManager.getRingtone(context, alarmUri)        ringtone.play()
    }
}
```

Output


11:41
Alarm
11:41 AM PM
Set Alarm
Stop Alarm


11:42
Alarm
11:43 AM PM
Set Alarm
Stop Alarm
Alarm ON...!


11:43
Alarm
11:43 AM PM
Set Alarm
Stop Alarm
Alarm Ringing...!


11:43
Alarm
11:43 AM PM
Set Alarm
Stop Alarm
Alarm OFF...!

Result

The Program has been executed successfully and the output has been verified Ex. No. : 10 Date : 16/4/25

Register No. : 220701301 Name : THARUN M

Telephony Services

Aim

Develop an android application to display the information of the telephony services.

Procedure

1. Create a new Kotlin project.

2. Set the project type to Kotlin/JVM if applicable.

3. Create a src directory inside the project (if not already created).

4. Create a new Kotlin file (e.g., Experiment.kt) inside src.

5. Add the main function to serve as the entry point:

6. Build your experiment logic: write functions, classes, and operations you want to test.

7. Run the program using the Run option or terminal command.

8. Analyze the output, make changes as needed, and repeat if necessary.

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">
   <uses-permission android:name="android.permission.READ_PHONE_STATE"/>
   <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:supportsRtl="true"
      android:theme="@style/Theme.TelephonyServices"        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>
```

activity_main.xml

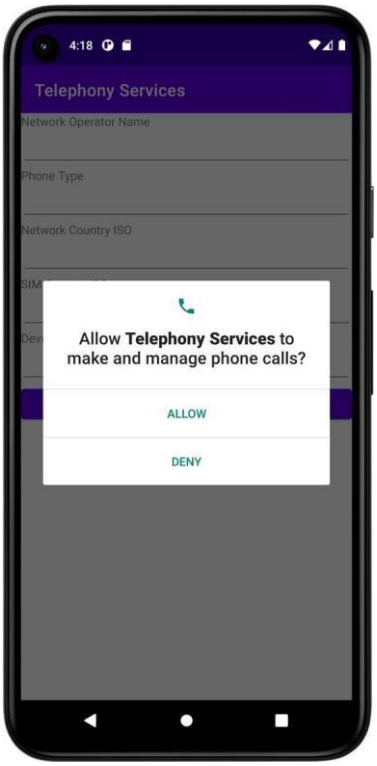
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"     xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"     android:layout_height="match_parent"     android:orientation="vertical"
tools:context=".MainActivity">

   <TextView
android:id="@+id/tvNetworkOperatorName"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Network Operator
Name" />

   <EditText
android:id="@+id/etNetworkOperatorName"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
      android:inputType="textPersonName" />

   <TextView
      android:id="@+id/tvPhoneType"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Phone Type" />

   <EditText
      android:id="@+id/etPhoneType"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
      android:inputType="textPersonName" />

   <TextView
android:id="@+id/tvNetworkCountryISO"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Network Country
ISO" />

   <EditText
android:id="@+id/etNetworkCountryISO"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
      android:inputType="textPersonName" />

   <TextView
      android:id="@+id/tvSIMCountryISO"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="SIM Country ISO" />

   <EditText
      android:id="@+id/etSIMCountryISO"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
```

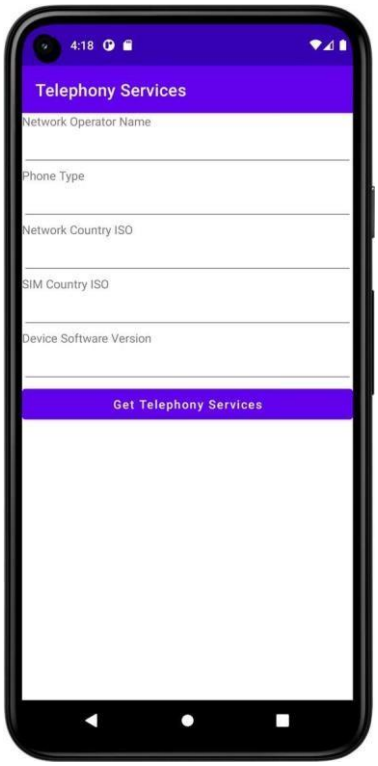
```
android:inputType="textPersonName" />
    <TextView
       android:id="@+id/tvDeviceSoftwareVersion"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Device Software
Version" />      <EditText        android:id="@+id/etDeviceSoftwareVersion"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
android:inputType="textPersonName" />
    <Button
       android:id="@+id/btGetTelephonyServices"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Get Telephony
Services"        android:textAllCaps="false" />  </LinearLayout>
```

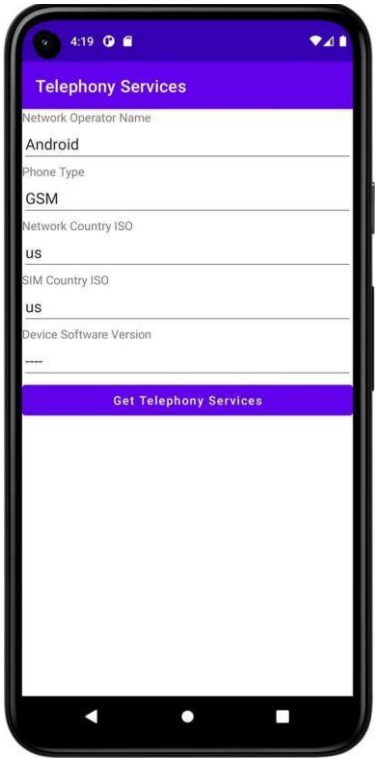
MainActivity.kt

```
package org.rajalakshmi.telephonyservices

import android.content.Context import
android.content.pm.PackageManager import
androidx.appcompat.app.AppCompatActivity import android.os.Bundle
import android.telephony.TelephonyManager import
android.widget.Button import android.widget.EditText import
androidx.core.app.ActivityCompat

class MainActivity : AppCompatActivity() {     private val REQUEST_CODE_PHONE_STATE
= 1000     override fun
onCreate(savedInstanceState: Bundle?) {         super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
        val etNetworkOperatorName : EditText = findViewById(R.id.etNetworkOperatorName)
       val etPhoneType : EditText = findViewById(R.id.etPhoneType)         val etNetworkCountryISO :
EditText = findViewById(R.id.etNetworkCountryISO)          val etSIMCountryISO : EditText =
findViewById(R.id.etSIMCountryISO)         val
etDeviceSoftwareVersion : EditText = findViewById(R.id.etDeviceSoftwareVersion)         val btGetTelephonyServices
: Button = findViewById(R.id.btGetTelephonyServices)
       val telephonyManager = getSystemService(Context.TELEPHONY_SERVICE) as TelephonyManager
if (ActivityCompat.checkSelfPermission(this, android.Manifest.permission.READ_PHONE_STATE) !=
PackageManager.PERMISSION_GRANTED ) {
           ActivityCompat.requestPermissions(this,
arrayOf(android.Manifest.permission.READ_PHONE_STATE), REQUEST_CODE_PHONE_STATE)
       }
       btGetTelephonyServices.setOnClickListener {             val networkOperatorName =
telephonyManager.networkOperatorName             val phoneType: Int =
telephonyManager.getPhoneType()             var strphoneType : String = ""             val networkCountryISO: String
= telephonyManager.getNetworkCountryIso()             val SIMCountryISO: String =
telephonyManager.getSimCountryIso()             val deviceSoftwareVersion: String? =
telephonyManager.getDeviceSoftwareVersion()

           when (phoneType) {
              TelephonyManager.PHONE_TYPE_CDMA -> strphoneType = "CDMA"
TelephonyManager.PHONE_TYPE_GSM -> strphoneType = "GSM"
              TelephonyManager.PHONE_TYPE_NONE -> strphoneType = "NONE"
           }
           etNetworkOperatorName.setText(networkOperatorName)           etPhoneType.setText(strphoneType)
etNetworkCountryISO.setText(networkCountryISO)           etSIMCountryISO.setText(SIMCountryISO)
           etDeviceSoftwareVersion.setText(deviceSoftwareVersion)         }
   }
}
```

Output







Result

The Program has been executed successfully and the output has been verified.

Ex. No. : 11 Date : 16/4/25

Register No. : 220701301 Name : THARUN M

Send SMS

Aim

Develop an application to send SMS.

Procedure

1. Create a new Kotlin project.
2. Set the project type to Kotlin/JVM if applicable.
3. Create a src directory inside the project (if not already created).
4. Create a new Kotlin file (e.g., Experiment.kt) inside src.
5. Add the main function to serve as the entry point:
6. Build your experiment logic: write functions, classes, and operations you want to test.
7. Run the program using the Run option or terminal command.
8. Analyze the output, make changes as needed, and repeat if necessary.

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">
   <uses-permission android:name="android.permission.SEND_SMS"/>
   <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:supportsRtl="true"
android:theme="@style/Theme.SendSMS"        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>
```

activity_main.xml

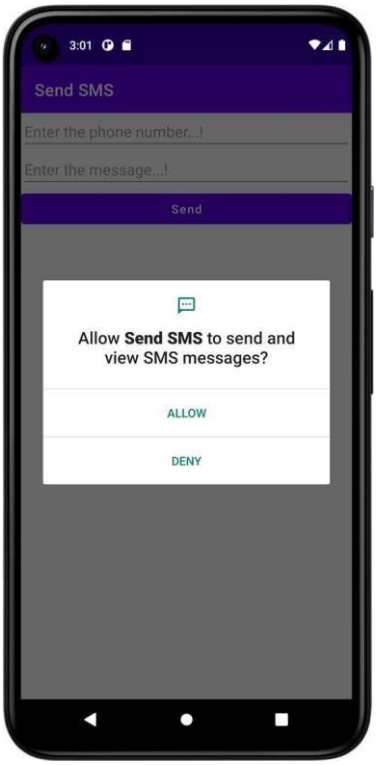
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"     xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"     android:layout_height="match_parent"     android:orientation="vertical"
tools:context=".MainActivity">

   <EditText
      android:id="@+id/etPhoneNumber"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
      android:hint="Enter the phone number...!"
android:inputType="textPersonName" />

   <EditText        android:id="@+id/etMessage"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:ems="10"
      android:hint="Enter the message...!"
android:inputType="textPersonName" />

   <Button        android:id="@+id/btSend"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Send"
      android:textAllCaps="false"                    />
</LinearLayout>
```

MainActivity.kt

```
package org.rajalakshmi.sendsms

import android.os.Build
import androidx.appcompat.app.AppCompatActivity import android.os.Bundle
import android.telephony.SmsManager import android.widget.Button import
android.widget.EditText import android.widget.Toast
import androidx.core.app.ActivityCompat

class MainActivity : AppCompatActivity() {     override fun onCreate(savedInstanceState:
Bundle?) {       super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)

      val etPhoneNumber : EditText = findViewById(R.id.etPhoneNumber)       val etMessage : EditText
= findViewById(R.id.etMessage)       val btSend : Button = findViewById(R.id.btSend)
ActivityCompat.requestPermissions(this, arrayOf(android.Manifest.permission.SEND_SMS),1000)

      btSend.setOnClickListener {
         val phoneNumber = etPhoneNumber.text.toString()          val message =
etMessage.text.toString()          val smsManager: SmsManager          smsManager =
SmsManager.getDefault()          smsManager.sendTextMessage(phoneNumber, null,
message, null, null)
```

```
        Toast.makeText(applicationContext, "Message Sent",
Toast.LENGTH_LONG).show()
      }
   } }
```

Output




3:05
Send SMS
9791519152
Welcome to Android...!
Send


3:06
Send SMS
9791519152
Welcome to Android...!
Send
Message Sent

Result

The Program has been executed successfully and the output has been verified.

Ex. No. : 12 Date : 17/4/25

Register No. : 220701301 Name : THARUN M

Send Email

Aim

Develop an application to send Email.

Procedure

1. Create a new Kotlin project.

2. Set the project type to Kotlin/JVM if applicable.

3. Create a src directory inside the project (if not already created).

4. Create a new Kotlin file (e.g., Experiment.kt) inside src.

5. Add the main function to serve as the entry point:

6. Build your experiment logic: write functions, classes, and operations you want to test.

7. Run the program using the Run option or terminal command.

8. Analyze the output, make changes as needed, and repeat if necessary.

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:supportsRtl="true"
android:theme="@style/Theme.SendEmail"        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>
```

activity_main.xml

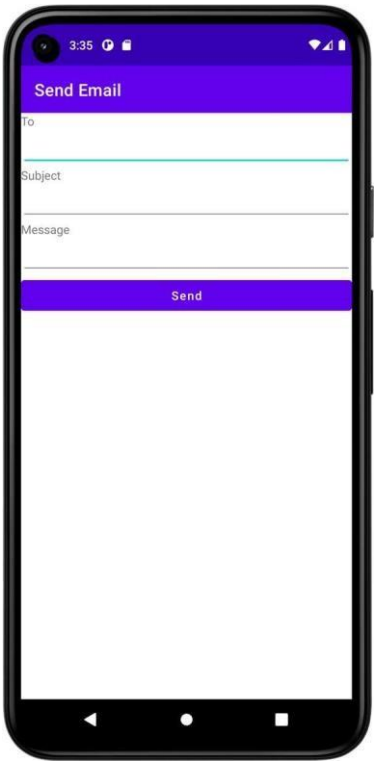
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"     xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"     android:layout_height="match_parent"     android:orientation="vertical"
tools:context=".MainActivity">

   <TextView         android:id="@+id/tvEmail"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:text="To" />

   <EditText         android:id="@+id/etEmail"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:ems="10"
      android:inputType="textPersonName" />

   <TextView         android:id="@+id/tvSubject"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:text="Subject" />

   <EditText         android:id="@+id/etSubject"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:ems="10"
      android:inputType="textPersonName" />

   <TextView         android:id="@+id/tvMessage"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:text="Message" />

   <EditText         android:id="@+id/etMessage"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:ems="10"
      android:inputType="textPersonName" />

   <Button         android:id="@+id/btSend"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:text="Send"
      android:textAllCaps="false"                        />
</LinearLayout>
```

MainActivity.kt

```
package org.rajalakshmi.sendemail

import android.content.Intent
import androidx.appcompat.app.AppCompatActivity import android.os.Bundle
import android.widget.Button import android.widget.EditText import
android.widget.TextView
```


```
class MainActivity : AppCompatActivity() {      override fun onCreate(savedInstanceState:
Bundle?) {        super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
        val etEmail : EditText = findViewById(R.id.etEmail)        val etSubject : EditText =
findViewById(R.id.etSubject)        val etMessage : EditText = findViewById(R.id.etMessage)
val btSend : Button = findViewById(R.id.btSend)

       btSend.setOnClickListener {            val email = etEmail.text.toString()            val subject =
etSubject.text.toString()            val message = etMessage.text.toString()            val intent =
Intent(Intent.ACTION_SEND)            intent.putExtra(Intent.EXTRA_EMAIL, arrayOf(email))
intent.putExtra(Intent.EXTRA_SUBJECT, subject)            intent.putExtra(Intent.EXTRA_TEXT, message)
intent.type = "message/rfc822"            startActivity(Intent.createChooser(intent, "Choose an Email client  :"))
       }
   } }
```

Output



Result

The Program has been executed successfully and the output has been verified.

Ex. No. : 13 Date : 17/4/25

Register No. : 220701301 Name : THARUN M

Text to Speech

Aim

Develop an android application to perform Text to Speech.

Procedure

1. Create a new Kotlin project.
2. Set the project type to Kotlin/JVM if applicable.
3. Create a src directory inside the project (if not already created).
4. Create a new Kotlin file (e.g., Experiment.kt) inside src.
5. Add the main function to serve as the entry point:
6. Build your experiment logic: write functions, classes, and operations you want to test.
7. Run the program using the Run option or terminal command.
8. Analyze the output, make changes as needed, and repeat if necessary.

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:supportsRtl="true"
        android:theme="@style/Theme.TextToSpeech"
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>
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
tools:context=".MainActivity">

   <EditText         android:id="@+id/etText"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:ems="10"
      android:hint="Enter the text..!"
android:inputType="textPersonName"         android:textSize="24sp" />

   <Button         android:id="@+id/btSpeak"
android:layout_width="match_parent"
android:layout_height="wrap_content"         android:text="Speak"
android:textAllCaps="false"         android:textSize="24sp" />  </LinearLayout>
```

MainActivity.kt

```
package org.rajalakshmi.texttospeech

import androidx.appcompat.app.AppCompatActivity import android.os.Bundle
import android.speech.tts.TextToSpeech import android.widget.Button import
android.widget.EditText import android.widget.Toast import java.util.*

class MainActivity : AppCompatActivity(), TextToSpeech.OnInitListener {     lateinit var tts :
TextToSpeech     lateinit var btSpeak : Button      override fun onCreate(savedInstanceState:
Bundle?) {
super.onCreate(savedInstanceState)        setContentView(R.layout.activity_main)        val
etText : EditText = findViewById(R.id.etText)        btSpeak =
findViewById(R.id.btSpeak)        btSpeak.isEnabled = false        tts = TextToSpeech(this,
this)

      btSpeak.setOnClickListener {            val text =
etText!!.text.toString()
         tts!!.speak(text, TextToSpeech.QUEUE_FLUSH, null,"")        }
   }     override fun onInit(status: Int) {        if (status ==
TextToSpeech.SUCCESS) {            val result = tts!!.setLanguage(Locale.US)

         if (result == TextToSpeech.LANG_MISSING_DATA || result ==
TextToSpeech.LANG_NOT_SUPPORTED) {
            Toast.makeText(applicationContext, "The Language not supported...!", Toast.LENGTH_LONG).show()
         }            else {
            btSpeak!!.isEnabled = true
         }
      }
   }
}
```


Output

Result

The Program has been executed successfully and the output has been verified.

Ex. No. : 14 Date : 17/4/25

Register No. : 220701301 Name : THARUN M

Speech to Text

Aim

Develop an android application to perform Speech to Text.

Procedure

1. Create a new Kotlin project.
2. Set the project type to Kotlin/JVM if applicable.
3. Create a src directory inside the project (if not already created).
4. Create a new Kotlin file (e.g., Experiment.kt) inside src.
5. Add the main function to serve as the entry point:
6. Build your experiment logic: write functions, classes, and operations you want to test.
7. Run the program using the Run option or terminal command.
8. Analyze the output, make changes as needed, and repeat if necessary.

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:supportsRtl="true"
      android:theme="@style/Theme.SpeechToText"
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>
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
tools:context=".MainActivity">

   <ImageView         android:id="@+id/imgMic"
android:layout_width="match_parent"
android:layout_height="250dp"
      app:srcCompat="@android:drawable/ic_btn_speak_now" />

   <TextView
      android:id="@+id/tvText"        android:layout_width="match_parent"
android:layout_height="wrap_content"        android:text="Output appears
here...!"        android:textSize="24sp" />  </LinearLayout>
```

MainActivity.kt

```
package org.rajalakshmi.speechtotext

import android.content.Intent
import androidx.appcompat.app.AppCompatActivity import android.os.Bundle  import
android.speech.RecognizerIntent import
android.widget.ImageView import android.widget.TextView
import java.util.*

class MainActivity : AppCompatActivity() {     lateinit var tvText :
TextView      private val REQUEST_CODE_SPEECH_INPUT = 1000
override fun
onCreate(savedInstanceState: Bundle?) {         super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)

        var imgMic : ImageView = findViewById(R.id.imgMic)         tvText =
findViewById(R.id.tvText)         imgMic.setOnClickListener {
            val intent = Intent(RecognizerIntent.ACTION_RECOGNIZE_SPEECH)
intent.putExtra(RecognizerIntent.EXTRA_LANGUAGE_MODEL,
RecognizerIntent.LANGUAGE_MODEL_FREE_FORM)
            intent.putExtra(RecognizerIntent.EXTRA_LANGUAGE, Locale.getDefault())
            intent.putExtra(RecognizerIntent.EXTRA_PROMPT, "Speak...!")             startActivityForResult(intent,
REQUEST_CODE_SPEECH_INPUT)         }
    }      override fun onActivityResult(requestCode: Int, resultCode: Int, data: Intent?) {
super.onActivityResult(requestCode, resultCode, data)
        if(requestCode == REQUEST_CODE_SPEECH_INPUT && resultCode == RESULT_OK
&& data != null) {
            var res : ArrayList<String> =
data.getStringArrayListExtra(RecognizerIntent.EXTRA_RESULTS) as ArrayList<String>
tvText.setText( Objects.requireNonNull(res)[0])
        }
    }
}
```

Output

Result

The Program has been executed successfully and the output has been verified.

Ex. No. : 15 Date : 23/4/25

Register No. : 220701301 Name : THARUN M

Image Capture

Aim

Develop an android application to capture image using camera and displaying the image using ImageView.

Procedure

1. Create a new Kotlin project.
2. Set the project type to Kotlin/JVM if applicable.
3. Create a src directory inside the project (if not already created).
4. Create a new Kotlin file (e.g., Experiment.kt) inside src.
5. Add the main function to serve as the entry point:
6. Build your experiment logic: write functions, classes, and operations you want to test.
7. Run the program using the Run option or terminal command.
8. Analyze the output, make changes as needed, and repeat if necessary.

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:supportsRtl="true"
        android:theme="@style/Theme.ImageCapture"
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>
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
tools:context=".MainActivity">

   <ImageView         android:id="@+id/imgImage"
android:layout_width="match_parent"
android:layout_height="500dp"
      app:srcCompat="@android:drawable/ic_menu_camera" />

   <Button
      android:id="@+id/btTakePicture"
android:layout_width="match_parent"
android:layout_height="wrap_content"        android:inputType="textCapWords"
android:text="Take Picture" />  </LinearLayout>
```

MainActivity.kt

```
package org.rajalakshmi.imagecapture

import android.content.Intent import
android.graphics.Bitmap
import androidx.appcompat.app.AppCompatActivity import android.os.Bundle
import android.provider.MediaStore import android.widget.Button import
android.widget.ImageView

class MainActivity : AppCompatActivity() {     lateinit var imgImage : ImageView     private
val REQUEST_CODE_IMAGE_CAPTURE = 1000     override fun
onCreate(savedInstanceState: Bundle?) {         super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)

        imgImage = findViewById(R.id.imgImage)          val
btTakePicture : Button = findViewById(R.id.btTakePicture)

        btTakePicture.setOnClickListener {              val intent =
Intent(MediaStore.ACTION_IMAGE_CAPTURE)             startActivityForResult(intent,
REQUEST_CODE_IMAGE_CAPTURE)
        }
    }     override fun onActivityResult(requestCode: Int, resultCode: Int, data: Intent?) {
super.onActivityResult(requestCode, resultCode, data)
        if(requestCode == REQUEST_CODE_IMAGE_CAPTURE && resultCode == RESULT_OK)
{             val photo = data!!.extras!!["data"] as Bitmap?
imgImage.setImageBitmap(photo)
        }
    }
}
```

Output

Result

The Program has been executed successfully and the output has been verified.