RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR, THANDALAM – 602 105

RAJALAKSHMI
ENGINEERING COLLEGE

CS19611
Mobile Application Development Laboratory

Laboratory Record Note Book

Name : VIDYALAKSHMI E

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

Register No. : 220701316

Semester : VI

Academic Year : 2024-25

RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR, THANDALAM – 602 105

BONAFIDE CERTIFICATE

Name : VIDYALAKSHMI E . . . . . .

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

Register No. 220701316

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

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

20 - 20

Signature of Faculty in-charge

Submitted for the Practical Examination held on 14.05.2025 . . . . . .

Internal Examiner **External Examiner**

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Reg. No. : 220701316 Name : Vidyalakshmi E

Year : III Branch : CSE Sec : D

Ex. No. : 01 **Date :**

Register No. : **Name :**

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

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>
```

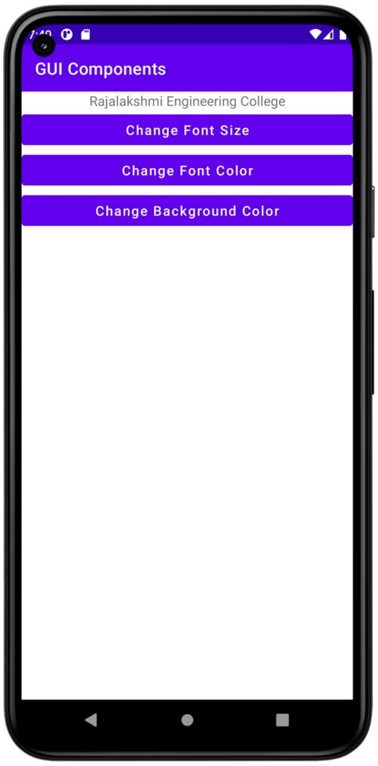
activity_main.xml

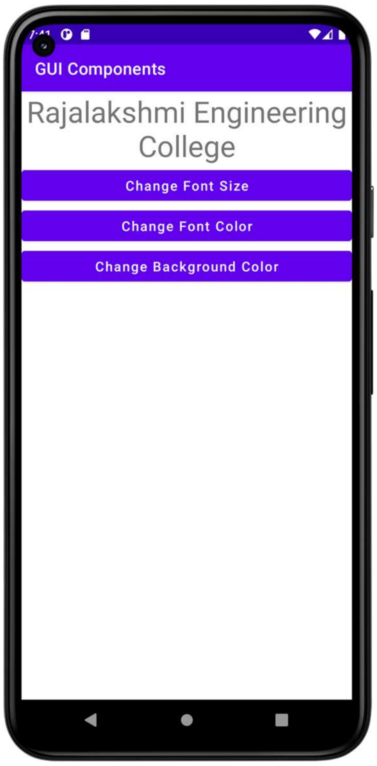
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/linearLayout"
    android:layout_width="match_parent"
    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>
```

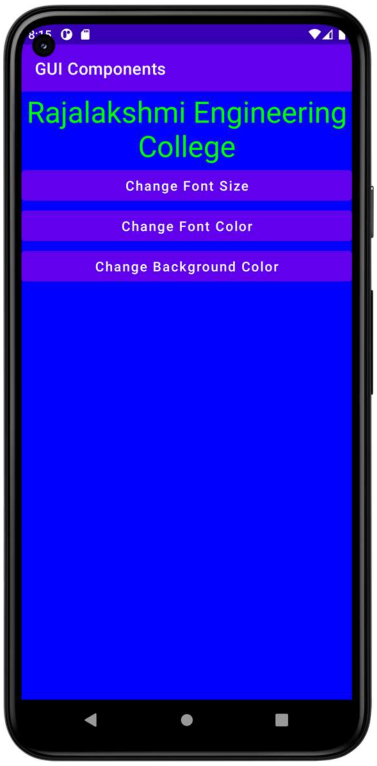
MainActivity.kt

```
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

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

Register No. : **Name :**

Simple Calculator

Aim

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

Procedure

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>
```

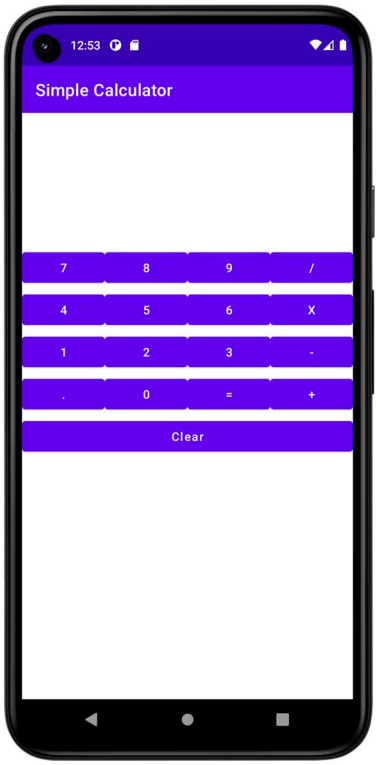
MainActivity.xml

```
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


12:53
Simple Calculator
7 8 9 /
4 5 6 X
1 2 3 -
. 0 = +
Clear


12:54
Simple Calculator
5.0 / 2.0
2.5
7 8 9 /
4 5 6 X
1 2 3 -
. 0 = +
Clear

Ex. No. : 03 **Date :**

Register No. : **Name :**

Graphical Primitives

Aim

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

Procedure

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>
```

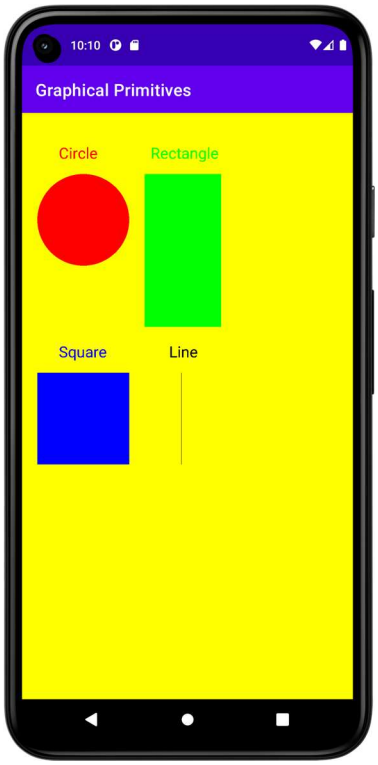
MainActivity.kt

```
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



Result

Ex. No. : 04 **Date :**

Register No. : **Name :**

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

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>
```

MainActivity.kt

```
package org.rajalakshmi.androidfragments

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)
    }
}
```

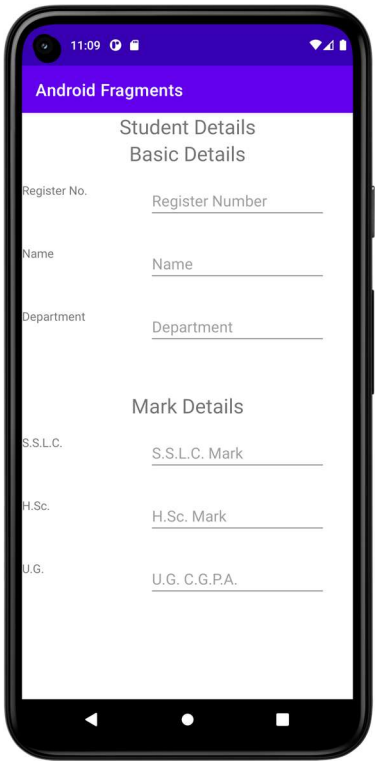
StudentBasicDetails.kt

```
package org.rajalakshmi.androidfragments
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 org.rajalakshmi.androidfragments
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

Ex. No. : 05 **Date :**

Register No. : **Name :**

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

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

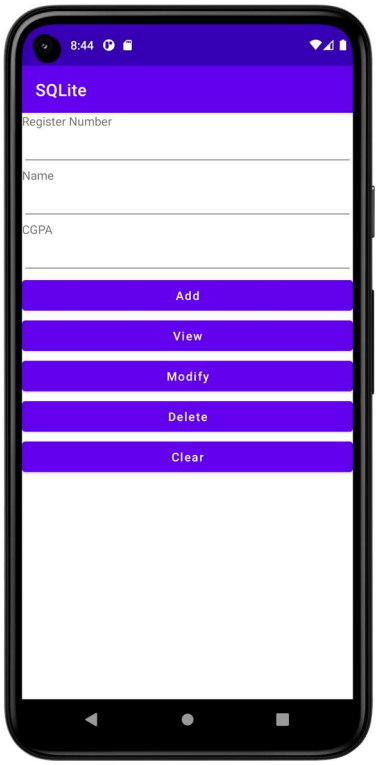
```
package org.rajalakshmi.sqlite

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()) {
```

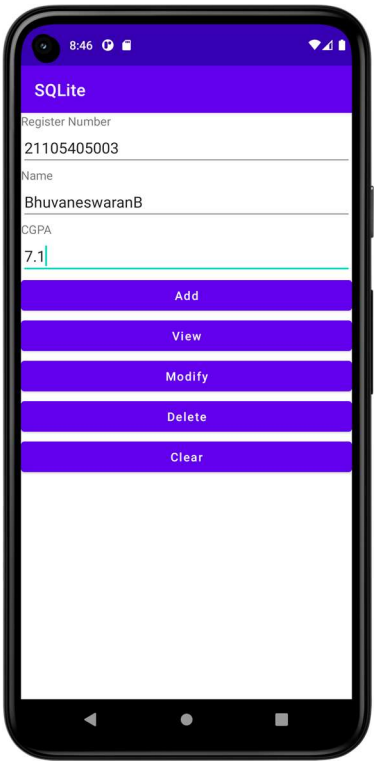
```
            while (cursor.isAfterLast == false) {
                name =
cursor.getString(cursor.getColumnIndex(DBContract.UserEntry.COLUMN_NAME))
                cgpa =
cursor.getString(cursor.getColumnIndex(DBContract.UserEntry.COLUMN_CGPA))
                users.add(UserModel(registerNumber, name, 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


8:44
SQLite
Register Number
Name
CGPA
Add
View
Modify
Delete
Clear


8:46
SQLite
Register Number
21105405003
Name
BhuvaneswaranB
CGPA
7.1
Add
View
Modify
Delete
Clear

Ex. No. : 06 **Date :**

Register No. : **Name :**

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

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" 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/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" 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=".MainActivity2">

    <TextView
        android:id="@+id/tvLoginSuccess"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Login Success...!"
        android:textAlignment="center"
        android:textSize="24sp" />
</LinearLayout>
```

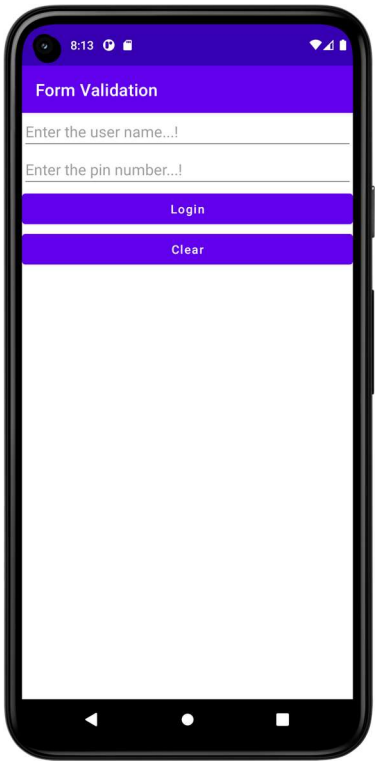
MainActivity.kt

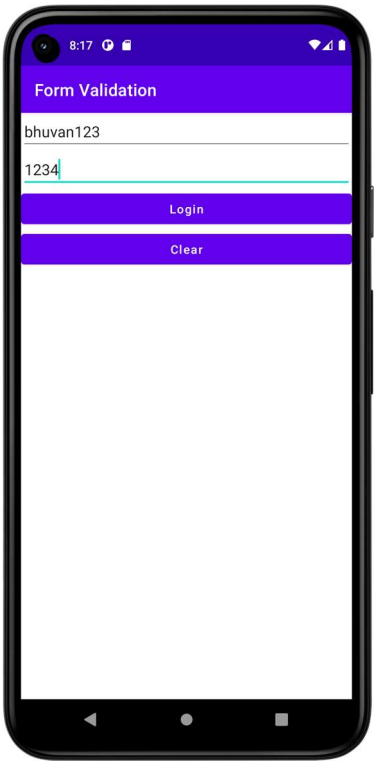
```
package org.rajalakshmi.formvalidation

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 = "[a-zA-Z]+".toRegex()
            val 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()
        }
    }
}
```

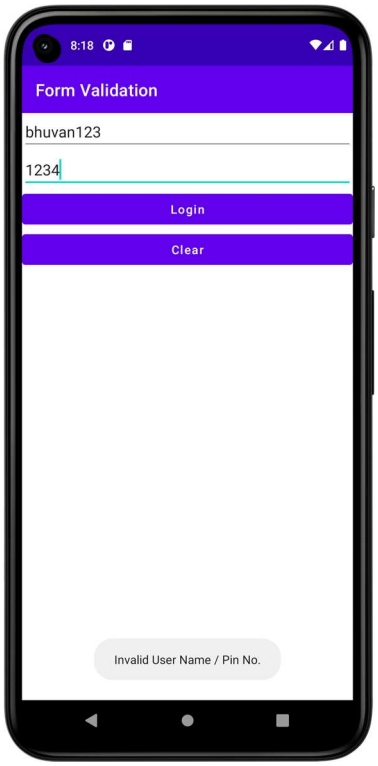
MainActivity2.kt

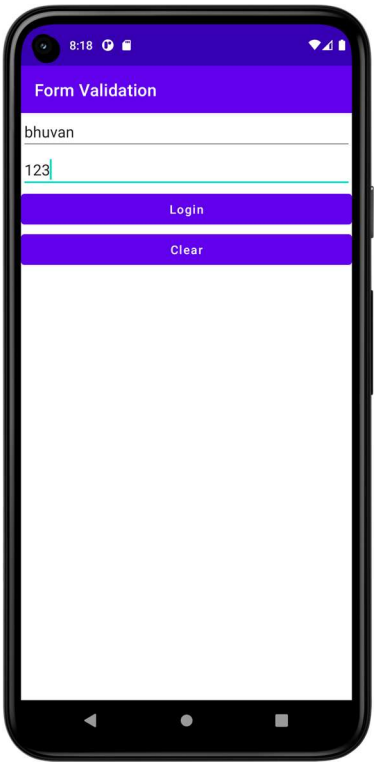
```
package org.rajalakshmi.formvalidation

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)
    }
}
```

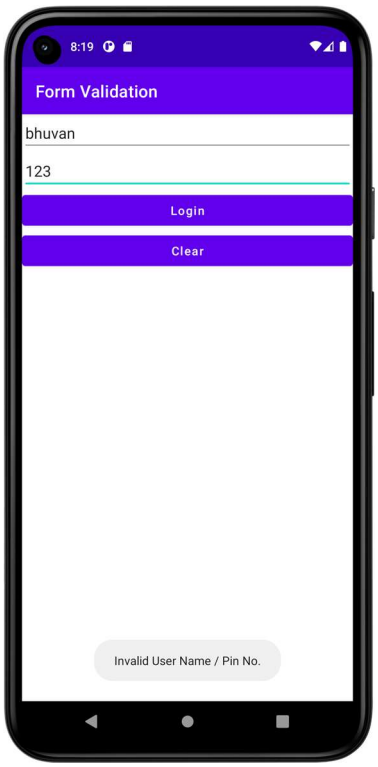
Output

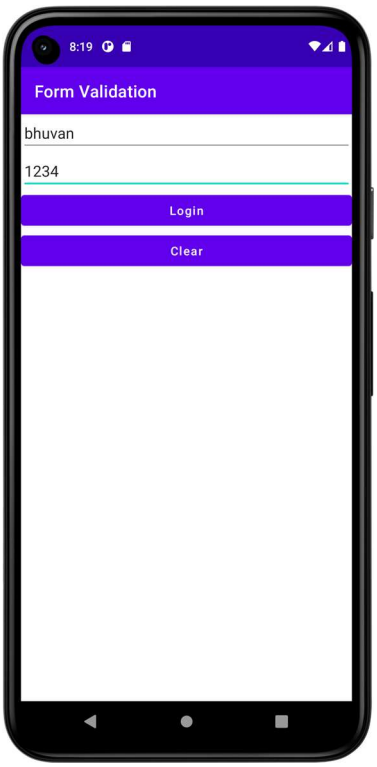

8:13
Form Validation
Enter the user name...!
Enter the pin number...!
Login
Clear

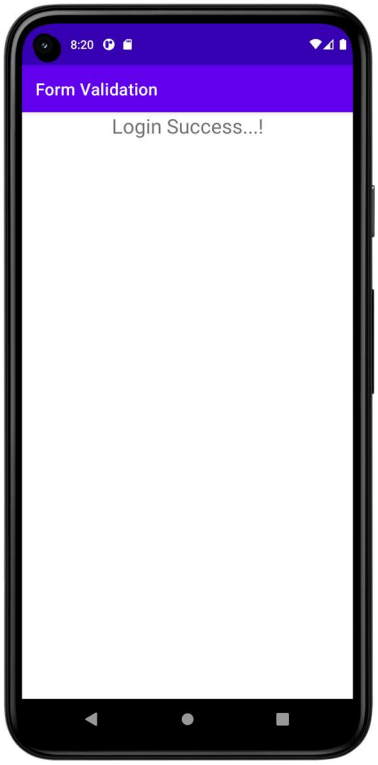

8:17
Form Validation
bhuvan123
1234
Login
Clear


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


8:18
Form Validation
bhuvan
123
Login
Clear


8:19
Form Validation
bhuvan
123
Login
Clear
Invalid User Name / Pin No.


8:19
Form Validation
bhuvan
1234
Login
Clear


8:20
Form Validation
Login Success...!

Result

Ex. No. : 07 **Date :**

Register No. : **Name :**

SD Card

Aim

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

Procedure

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>
```

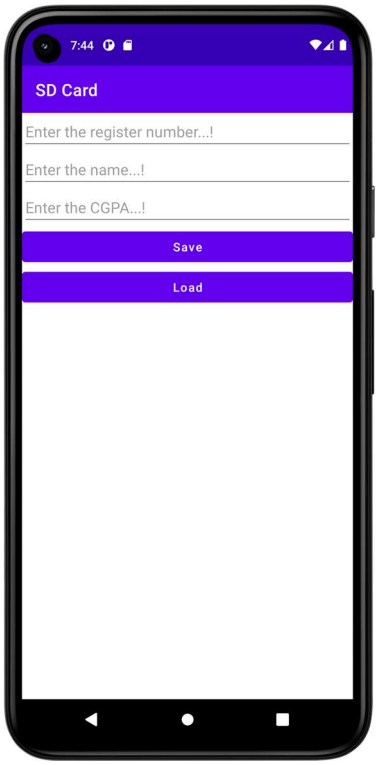
activity_main.xml

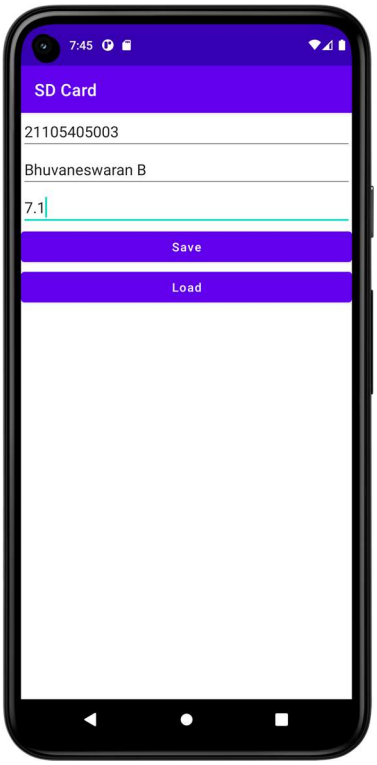
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"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

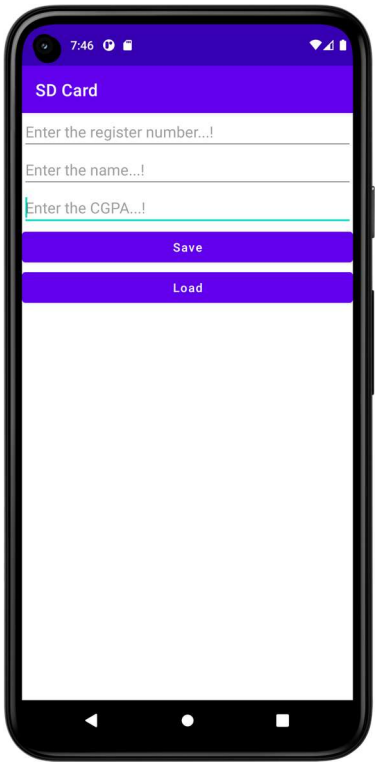
MainActivity.kt

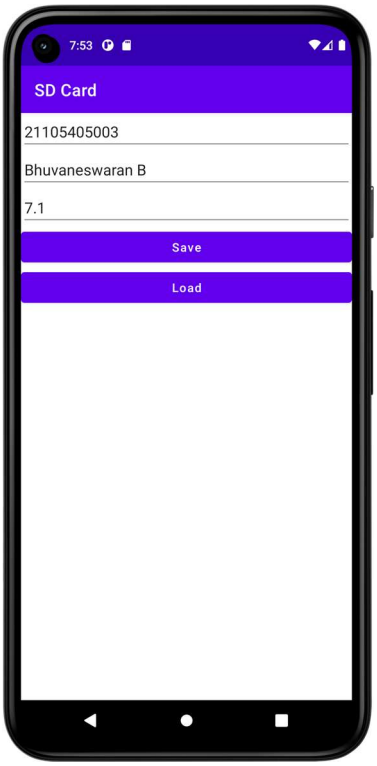
```
package org.rajalakshmi.sdcard

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

Ex. No. : 08 **Date :**

Register No. : **Name :**

Alert Dialog Box

Aim

Implement an application to display the alert box message.

Procedure

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>
```

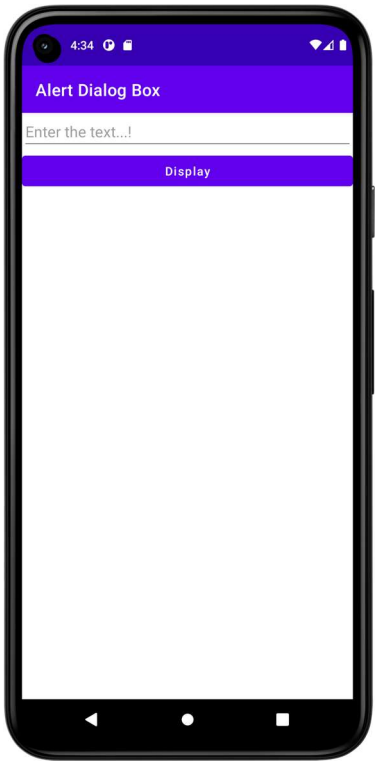
activity_main.xml

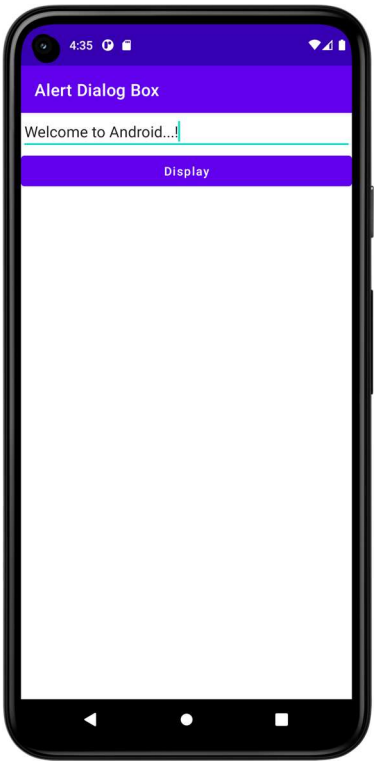
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"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

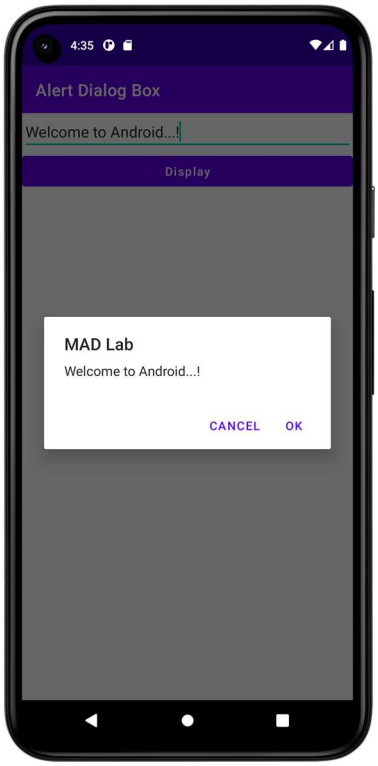
MainActivity.kt

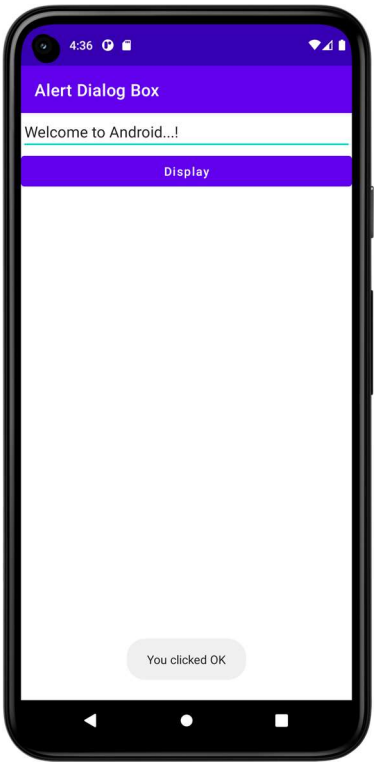
```
package org.rajalakshmi.alertdialogbox

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()
        }
    }
}
```

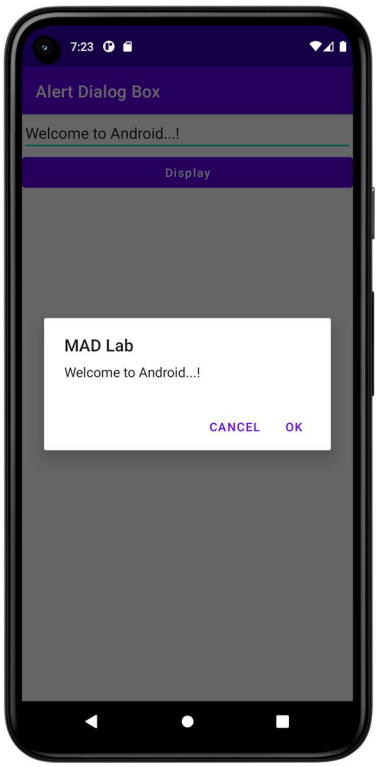
Output

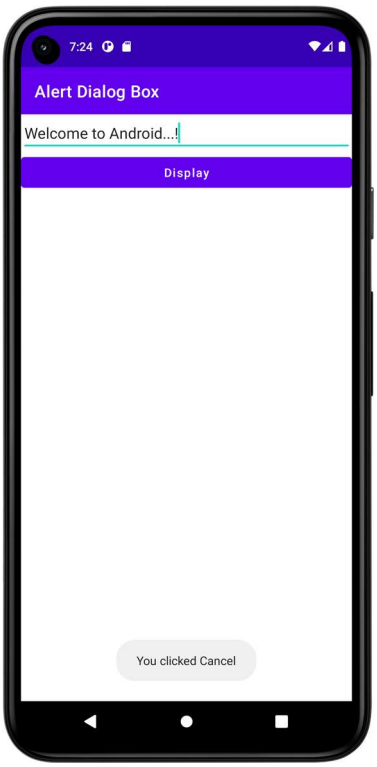

4:34
Alert Dialog Box
Enter the text...!
Display


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

Ex. No. : 09 **Date :**

Register No. : **Name :**

Alarm

Aim

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

Procedure

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>
```

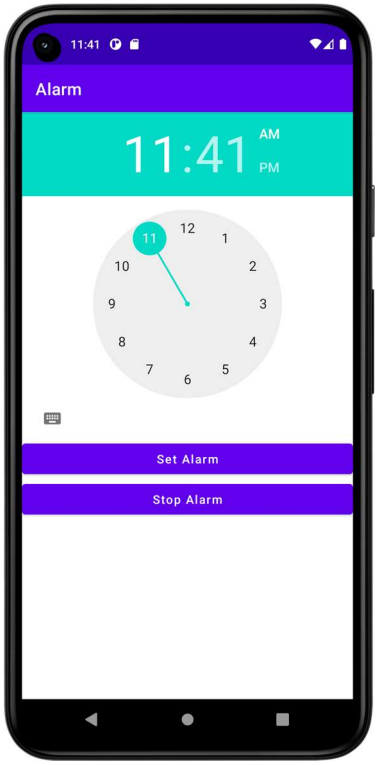
MainActivity.kt

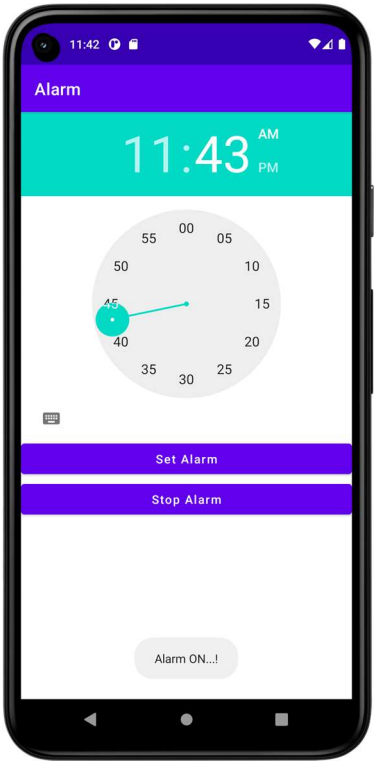
```
package org.rajalakshmi.myapplication

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()
        }
    }
}
```

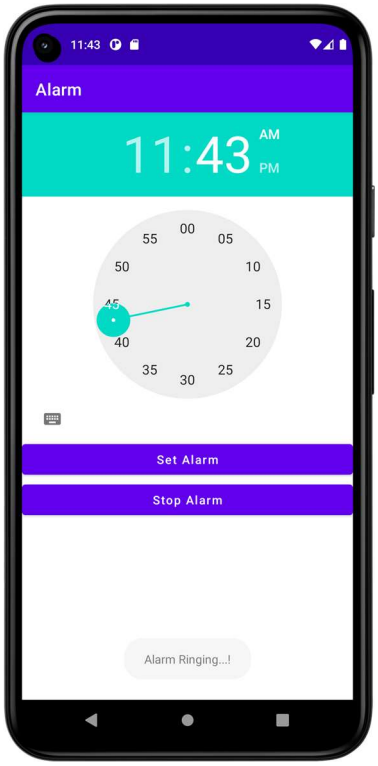
AlarmReceiver.kt

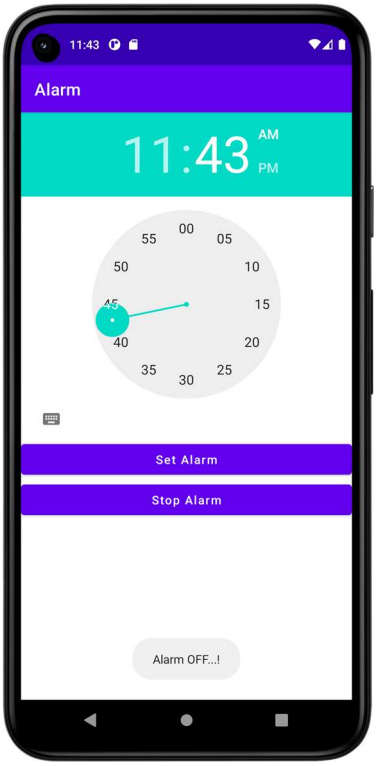
```
package org.rajalakshmi.myapplication

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...!

Ex. No. : 10 **Date :**

Register No. : **Name :**

Telephony Services

Aim

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

Procedure

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

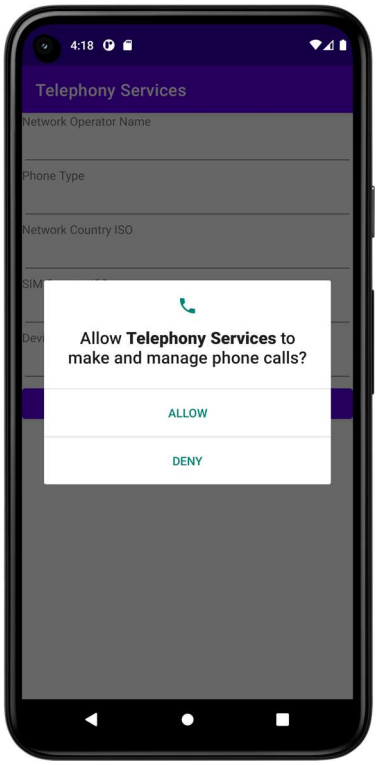
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"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

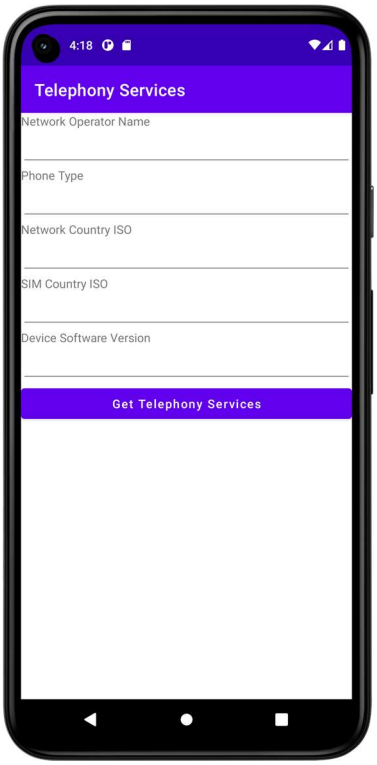
```
        android:inputType="textPersonName" />

    <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>
```

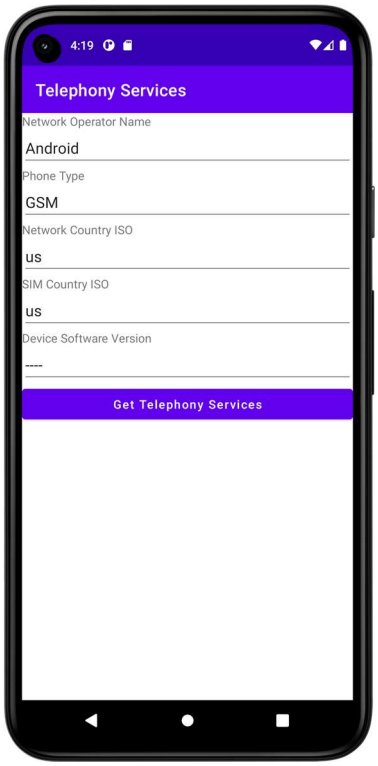
MainActivity.kt

```
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

Ex. No. : 11 **Date :**

Register No. : **Name :**

Send SMS

Aim

Develop an application to send SMS.

Procedure

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>
```

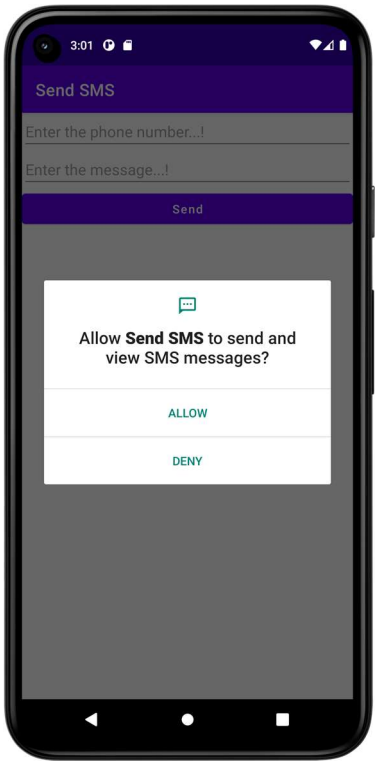
activity_main.xml

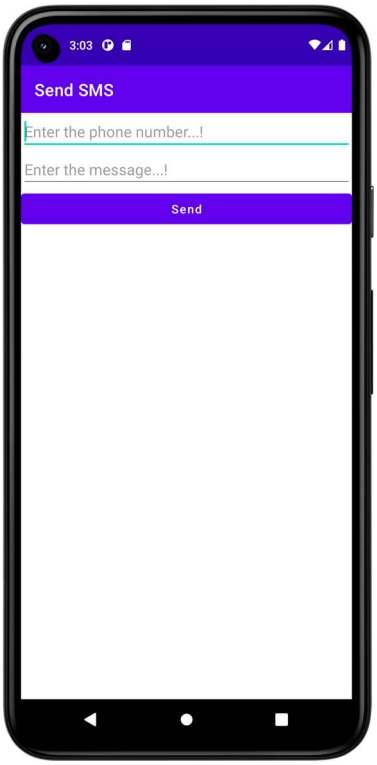
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"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

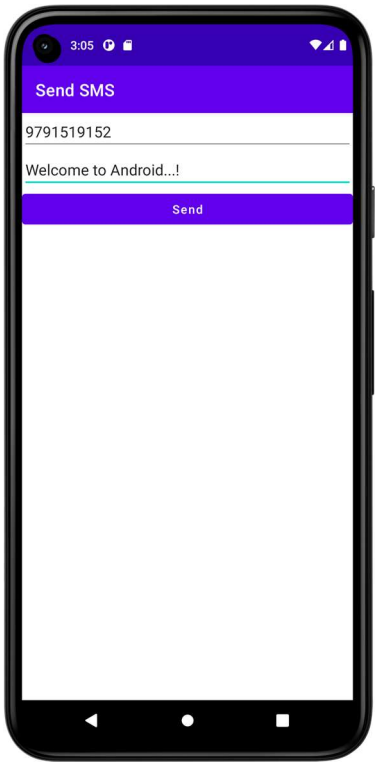
MainActivity.kt

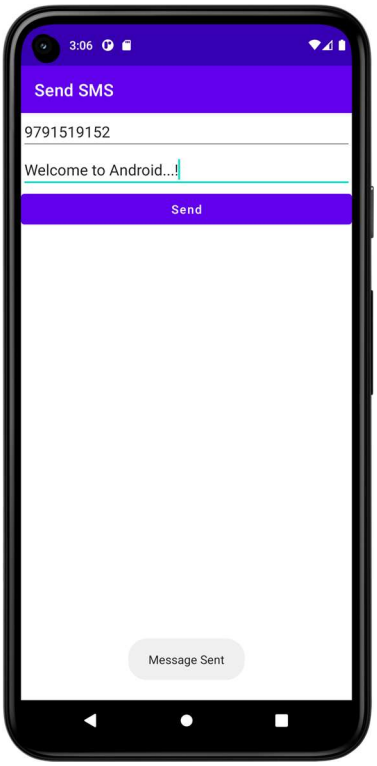
```
package org.rajalakshmi.sendsms

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









Result

Ex. No. : 12 **Date :**

Register No. : **Name :**

Send Email

Aim

Develop an application to send Email.

Procedure

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>
```

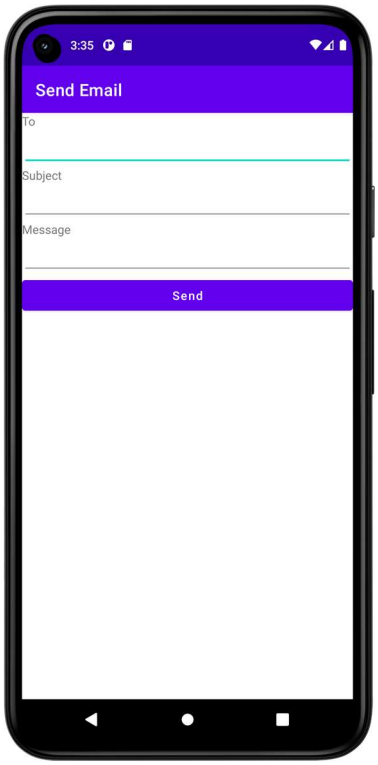
activity_main.xml

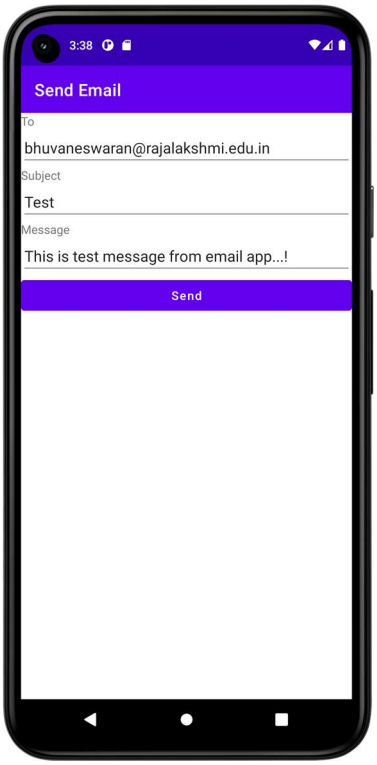
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"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

Ex. No. : 13 **Date :**

Register No. : **Name :**

Text to Speech

Aim

Develop an android application to perform Text to Speech.

Procedure

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

Ex. No. : 14 **Date :**

Register No. : **Name :**

Speech to Text

Aim

Develop an android application to perform Speech to Text.

Procedure

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

Ex. No. : 15 **Date :**

Register No. : **Name :**

Image Capture

Aim

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

Procedure

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>
```

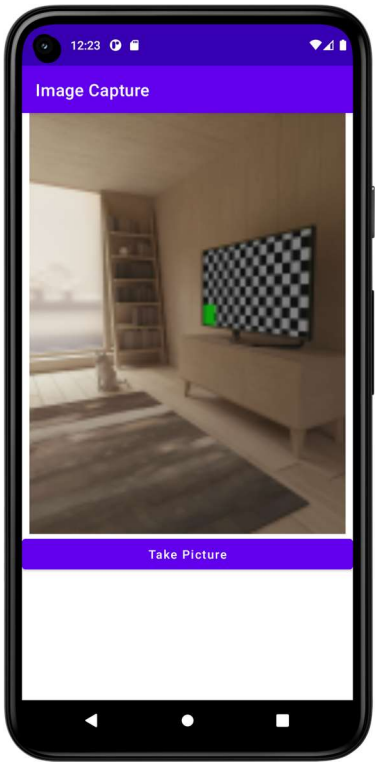
activity_main.xml

```
<?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