RAJALAKSHMI ENGINEERING COLLEGE
RAJALAKSHMI NAGAR, THANDALAM – 602 105

RAJALAKSHMI ENGINEERING COLLEGE
RAJALAKSHMI NAGAR, THANDALAM – 602 105

BONAFIDE CERTIFICATE

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Academic Year : . . . . .2025 . . . . Semester : . . . . 6 . . . Branch : . . CSE . . . .
. . .

Register No.220701507

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

. ....Laboratory during the year

20   - 20

Signature of Faculty in-charge

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

Internal Examiner   **External Examiner**

Dept. of Computer Science and Engineering | Rajalakshmi Engineering College

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**Dept. of Computer Science and Engineering | Rajalakshmi
Engineering College**

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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
<?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_r
        ules" 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" />
```

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

</manifest>
```

activity_main.xml

```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 HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
```

```xml
    "http://schemas.android.com/apk/res-auto""
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/linearLayout"
                                      android:layout_width="match_p
arent" android:layout_height="match_parent"
    android:orientation="vertical" tools:context=".MainActivity"
    >

    <TextView
                                  android:id="@+id/t
        vText"
        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_p
        arent"
        android:layout_height="wrap_c
        ontent "
        android:inputType="textCapSen
        tences " android:text="Change
        Font Size"
        android:textSize="16sp" />

    <Button
        android:id="@+id/btFontColor"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent "
        android:inputType="textCapSen
        tences " 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

```kotlin
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.setOnClickListene
            r                              { tvText.setTextSize(fontSize) fontSize = (fontS
        }
btFontColor.setOnClickListener          { when(fontColor % 3) {
                • -> tvText.setTextColor(Color.RED)
                • -> tvText.setTextColor(Color.GREEN)
                • -> tvText.setTextColor(Color.BLUE)
            }
            fontColor++
```

```kotlin
            }
btBackgroundColor.setOnClickListener                { when(backgroundColor % 3) {
                • -> linearLayout.setBackgroundColor(Color.RED)
                • -> linearLayout.setBackgroundColor(Color.GREEN)
                • -> linearLayout.setBackgroundColor(Color.BLUE)
            }
            backgroundColor++
        }
    }
```

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```kotlin
}
```

Rajalakshmi Engineering College

Change Font Size

Change Font Color

Change Background Color

Rajalakshmi Engineering College

Change Font Size

Change Font Color

Change Background Color

Result

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Ex. No.	:	02		Date	:	
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Simple Calculator

Aim

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

Procedure

AndroidManifest.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
```

```xml
<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"
```

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```xml
        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
<?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 HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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_p
        arent"
        android:layout_height="wrap_c
        ontent "
        android:textSize="60sp" />

    <TextView
        android:id="@+id/tvResult"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent "
        android:textSize="60sp" />

    <LinearLayout
```

```xml
        android:layout_width="match_parent"
        android:layout_height="50dp"
        android:orientation="horizontal">

        <Button android:id="@+id/btSeven"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_weight="1"
            android:text="7" />

        <Button android:id="@+id/btEight"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_weight="1"
            android:text="8" />

        <Button android:id="@+id/btNine"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_weight="1"
            android:text="9" />

        <Button
            android:id="@+id/btDivision"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_weight="1"
            android:text="/" />
    </LinearLayout>

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

```xml
        <Button android:id="@+id/btFour"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
```

```xml
            android:layout_weight="1"
            android:text="4" />

        <Button android:id="@+id/btFive"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_weight="1"
            android:text="5" />

        <Button android:id="@+id/btSix"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_weight="1"
            android:text="6" />

        <Button
            android:id="@+id/btMultiplication"
            android:layout_width="wrap_content
            "
            android:layout_height="wrap_conten
            t" 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_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_weight="1"
            android:text="1" />

        <Button android:id="@+id/btTwo"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_weight="1"
            android:text="2" />

        <Button android:id="@+id/btThree"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
```

```xml
            android:layout_weight="1"
            android:text="3" />

        <Button
            android:id="@+id/btSubtractio
            n"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_weight="1"
            android:text="-" />
```

```xml
</LinearLayout>
```

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

    <Button
        android:id="@+id/btDecimal"
        android:layout_width="wrap_co
        ntent"
        android:layout_height="wrap_c
        ontent "
        android:layout_weight="1"
        android:text="." />

    <Button android:id="@+id/btZero"
        android:layout_width="wrap_co
        ntent"
        android:layout_height="wrap_c
        ontent "
        android:layout_weight="1"
        android:text="0" />

    <Button android:id="@+id/btEqual"
        android:layout_width="wrap_co
        ntent"
        android:layout_height="wrap_c
        ontent "
        android:layout_weight="1"
        android:text="=" />

    <Button
        android:id="@+id/btAddition"
        android:layout_width="wrap_co
        ntent"
```

```xml
            android:layout_height="wrap_c
            ontent "
            android:layout_weight="1"
            android:text="+" />
    </LinearLayout>

    <Button android:id="@+id/btClear"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent " android:text="Clear"
        android:textAllCaps="false"
        />

</LinearLayout>
```

MainActivity.xml

```kotlin
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
```

```kotlin
: 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")
```

```kotlin
}               btSeven.setOnClickListener           {
tvExpression.setText("${tvExpression.text}7")
}
btEight.setOnClickListener                                                  {
    tvExpression.setText("${tvExpression.text}8")
}
btNine.setOnClickListener                                                   {
    tvExpression.setText("${tvExpression.text}9")
}
btDecimal.setOnClickListener    {
                                if(!decimal)        { tvExpression.setText("${tvE
    }
}
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}".toDo
    uble()   subtraction  =   true   decimal  =
    false tvExpression.setText(null)
    }
}
btMultiplication.setOnClickListener          {          if
    (tvExpression.getText().length != 0) { input1
    =
                "${tvExpression.text}".toDo
    uble()   multiplication  =   true decimal  =
    false tvExpression.setText(null)
    }
}
btDivision.setOnClickListener          {          if
    (tvExpression.getText().length != 0) { input1
    =        "${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("${in
    }
```

```
            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("")  input
        = 0.0 input2 = 0.0 decimal =
        false
        }
    }
}
```

of

Output

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
<?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_r
        ules" android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
```

```xml
        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/and
roid" xmlns:app="http://schemas.android.com/apk/res
HYPERLINK "http://schemas.android.com/apk/res-auto"-
HYPERLINK "http://schemas.android.com/apk/res-
auto"auto HYPERLINK
"http://schemas.android.com/apk/res-auto""
```

```xml
    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

```kotlin
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

```kotlin
package org.rajalakshmi.graphicalprimitives
import
        android.content.C
ontext 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

Graphical Primitives

Circle Rectangle

Square Line
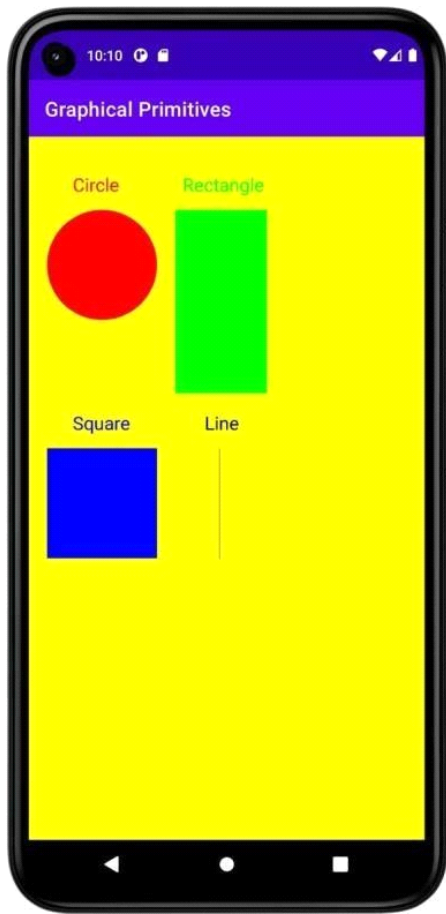
Result

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
<?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_r
        ules" 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">
```

```xml
        <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
<?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 HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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">
```

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```xml
    <TextView
        android:id="@+id/tvTitle"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent "
        android:text="Student
        Details"
        android:textAlignment="center
        " android:textSize="24sp" />

    <LinearLayout
```

```xml
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical">

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

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

    </LinearLayout>
</LinearLayout>
```

fragment_student_basic_details.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
```

```xml
<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/etRegisterNumb
        er"
        android:layout_width="wrap_cont
        ent"
        android:layout_height="wrap_con
        tent"
        android:layout_marginLeft="150d
        p"
        android:layout_marginTop="50dp"
        android:ems="10"
        android:hint="Register
                                    N
        umber"
        android:inputType="textPersonNa
        me" />
    <TextView
        android:id="@+id/tvName"
        android:layout_width="wrap_co
        ntent"
        android:layout_height="wrap_c
        ontent "
        android:layout_marginTop="125
        dp" android:text="Name" />
    <EditText
        android:id="@+id/etName"
        android:layout_width="wrap_co
        ntent"
        android:layout_height="wrap_c
        ontent "
        android:layout_marginLeft="15
        0dp"
        android:layout_marginTop="125
        dp" android:ems="10"
        android:hint="Name"
        android:inputType="textPersonName" />
    <TextView
```

```xml
        android:id="@+id/tvDepartment
        "
        android:layout_width="wrap_co
        ntent"
        android:layout_height="wrap_c
        ontent "
        android:layout_marginTop="200
        dp" android:text="Department"
        />
    <EditText
        android:id="@+id/etDepartment"
        android:layout_width="wrap_conte
        nt"
        android:layout_height="wrap_cont
        ent"
        android:layout_marginLeft="150dp
        "
        android:layout_marginTop="200dp"
        android:ems="10"
        android:hint="Department"
        android:inputType="textPersonNam
        e"
        />
</FrameLayout>
```

fragment_student_mark_details.xml

```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_co
        ntent"
        android:layout_height="wrap_c
        ontent "
```

```xml
            android:layout_marginTop="50d
            p" android:text="S.S.L.C." />
    <EditText
                        android:id="@+id/e
            tSSLC"
            android:layout_width="wrap_cont
            ent"
            android:layout_height="wrap_con
            tent"
            android:layout_marginLeft="150d
            p"
            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_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_marginTop="125
            dp" android:text="H.Sc." />
    <EditText android:id="@+id/etHSC"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_marginLeft="15
            0dp"
            android:layout_marginTop="125
            dp" android:ems="10"
            android:hint="H.Sc. Mark"
            android:inputType="textPersonName" />
    <TextView android:id="@+id/tvUG"
            android:layout_width="wrap_co
            ntent"
            android:layout_height="wrap_c
            ontent "
            android:layout_marginTop="200
            dp" android:text="U.G." />
    <EditText
                        android:id="@+id
            /etUG"
            android:layout_width="wrap_cont
            ent"
            android:layout_height="wrap_con
            tent"
            android:layout_marginLeft="150d
            p"
            android:layout_marginTop="200dp
            " android:ems="10"
                        android:hint="U.
            G. C.G.P.A."
            android:inputType="textPersonName" />
</FrameLayout>
```

MainActivity.kt

package

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```
org.rajalakshmi.androidfragments
```

import
```
androidx.appcompat.app.AppCompatActivi
ty import android.os.Bundle
class MainActivity : AppCompatActivity() { override fun
onCreate(savedInstanceState: Bundle?) {
super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
    }
}
```

org.rajalakshmi.androidfragments

StudentBasicDetails.kt

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

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

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

    override fun onCreate(savedInstanceState:
        Bundle?) {
        super.onCreate(savedInstanceState)
        arguments?.let          {          param1          = it.getString(ARG_PARAM1)  param2
```

```kotlin
            }
        }

    override    fun    onCreateView(    inflater:
        LayoutInflater,    container:    ViewGroup?,
        savedInstanceState: Bundle?
    ): View? {
        // Inflate the layout for this fragment
        return
        inflater.inflate(R.layout.fragment_student_basic_de
tails, 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. */
```

```kotlin
        org.rajalakshmi.androidfragments


        // 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

```kotlin
package
import        android.os.Bundle
import
androidx.fragment.app.Fragment
import
```

```kotlin
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
        }
    }

    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
```

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```kotlin
        org.rajalakshmi.androidfragments


         * this fragment using the provided parameters.
         *
         * @param param1 Parameter 1.
         * @param param2 Parameter 2.
         * @return A new instance of fragment StudentMarkDetails.
         */
```

```kotlin
        // 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

Android Fragments

Student Details
Basic Details

Register No.

Register Number

Name

Name

Department

Department

Mark Details

S.S.L.C.

S.S.L.C. Mark

H.Sc.

H.Sc. Mark

U.G.

U.G. C.G.P.A.

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
<?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_r
        ules" 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">
```

```xml
        <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>
```

and Engineering

activity_main.xml

```xml
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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"
    >
```

```xml
<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"
    />
```

```xml
    <Button android:id="@+id/btView"
android:layout_width="match_parent"
android:layout_height="wrap_content"
```

```xml
        android:text="View"
        android:textAllCaps="false"
        />

    <Button
        android:id="@+id/btModify"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent "
        android:text="Modify"
        android:textAllCaps="false"
        />

    <Button
        android:id="@+id/btDelete"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent "
        android:text="Delete"
        android:textAllCaps="false"
        />

    <Button android:id="@+id/btClear"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent " android:text="Clear"
        android:textAllCaps="false"
        />
</LinearLayout>
```

DBContract.kt

```kotlin
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

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

UsersDBHelper.kt

```kotlin
package org.rajalakshmi.sqlite
```

```kotlin
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()) {
```

of Computer   and Engineering

```kotlin
            while (cursor.isAfterLast == false) { name
                =
cursor.getString(cursor.getColumnIndex(DBContract.UserEntry.COLUMN_NAM
                E)) 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 + " (" +


    KEY," +


    DBContract.UserEntry.COLUMN_REGISTER_NUMBER + " TEXT PRIMARY


    DBContract.UserEntry.COLUMN_NAME + " TEXT," +
```

```
                    DBContract.UserEntry.COLUMN_CGPA + "        "
        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        = usersDB
            }
        }
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("")
        }
    }
}
```

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Output

Left screen:

8:44

SQLite

Register Number

Name

CGPA

Add

View

Modify

Delete

Clear

Right screen:

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

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

AndroidManifest.xml

```xml
<?xml version="1.0"
<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_r
    ules" 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
```

```xml
                    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>
```

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

activity_main.xml

```xml
<?xml version="1.0"
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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/etUse
        rName"
        android:layout_width="match_par
        ent"
        android:layout_height="wrap_con
        tent" android:ems="10"
        android:hint="Enter the
                userame...!"
        android:inputType="textPersonName" />

    <EditText
                android:id="@+id/etPinN
        umber"
        android:layout_width="match_paren
        t"
        android:layout_height="wrap_conte
        nt" android:ems="10"
                android:hint="Enter the
                    pin
                number...!"
        android:inputType="textPersonNam
        e" />

    <Button android:id="@+id/btLogin"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent " android:text="Login"
        android:textAllCaps="false"
        />

    <Button android:id="@+id/btClear"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent " android:text="Clear"
        android:textAllCaps="false"
        />
</LinearLayout>
```

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

activity_main2.xml

```xml
<?xml version="1.0"
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res
    "http://schemas.android.com/apk/res-auto"-
    "http://schemas.android.com/apk/res-auto"auto
    "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>
```

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

MainActivity.kt

```kotlin
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 =
```

```kotlin
            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

```kotlin
package
org.rajalakshmi.formvalidation import
androidx.appcompat.app.AppCompatActivi
ty import android.os.Bundle
class MainActivity2 : AppCompatActivity() {
override fun onCreate(savedInstanceState:
Bundle?) { super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main2)
    }
```

}

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Output
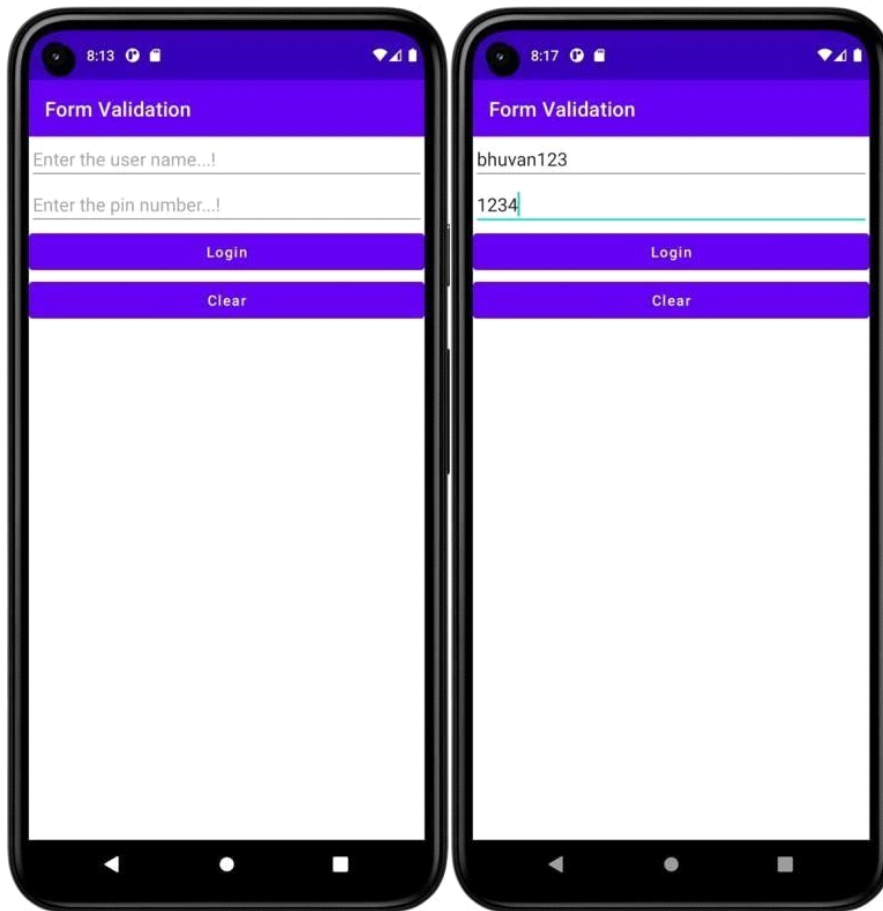
Form Validation

bhuvan

123

Login

Clear

Invalid User Name / Pin No.

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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
<?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
<?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 HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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">
```

```xml
<EditText
            android:id="@+id/etRegisterN
    umber"
    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/e
    tName"
    android:layout_width="match_par
    ent"
    android:layout_height="wrap_con
    tent" android:ems="10"
    android:hint="Enter the
                name...!"
    android:inputType="textPersonName" />

<EditText
                android:id="@+id/e
    tCGPA"
    android:layout_width="match_par
    ent"
    android:layout_height="wrap_con
    tent" android:ems="10"
    android:hint="Enter the
                CGPA...!"
    android:inputType="textPersonName" />

<Button android:id="@+id/btSave"
    android:layout_width="match_p
    arent"
    android:layout_height="wrap_c
    ontent " android:text="Save"
    android:textAllCaps="false"
    />

<Button android:id="@+id/btLoad"
    android:layout_width="match_p
    arent"
    android:layout_height="wrap_c
    ontent " android:text="Load"
    android:textAllCaps="false"
    />
</LinearLayout>
```

MainActivity.kt

```kotlin
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".toByteA
            rray()
            ) outputStream.close()

            etRegisterNumber.text.cle
            ar() 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
```
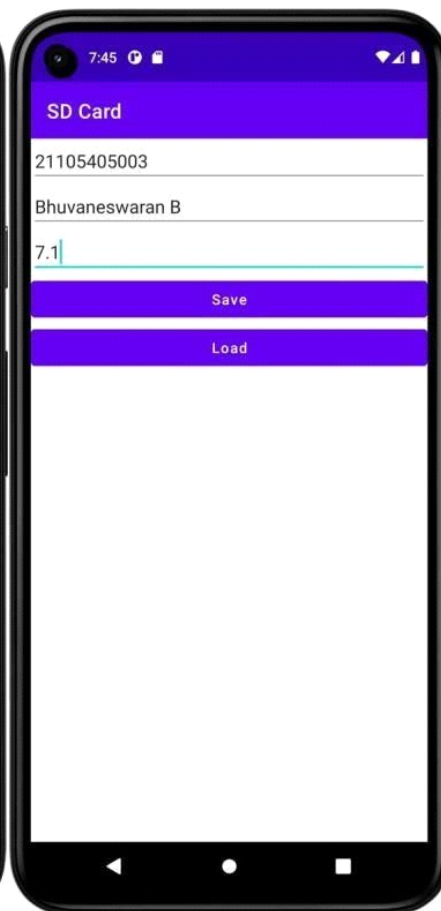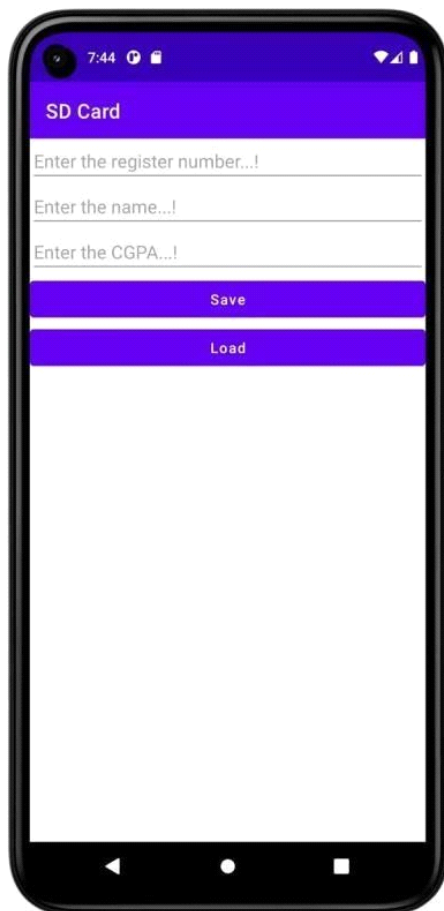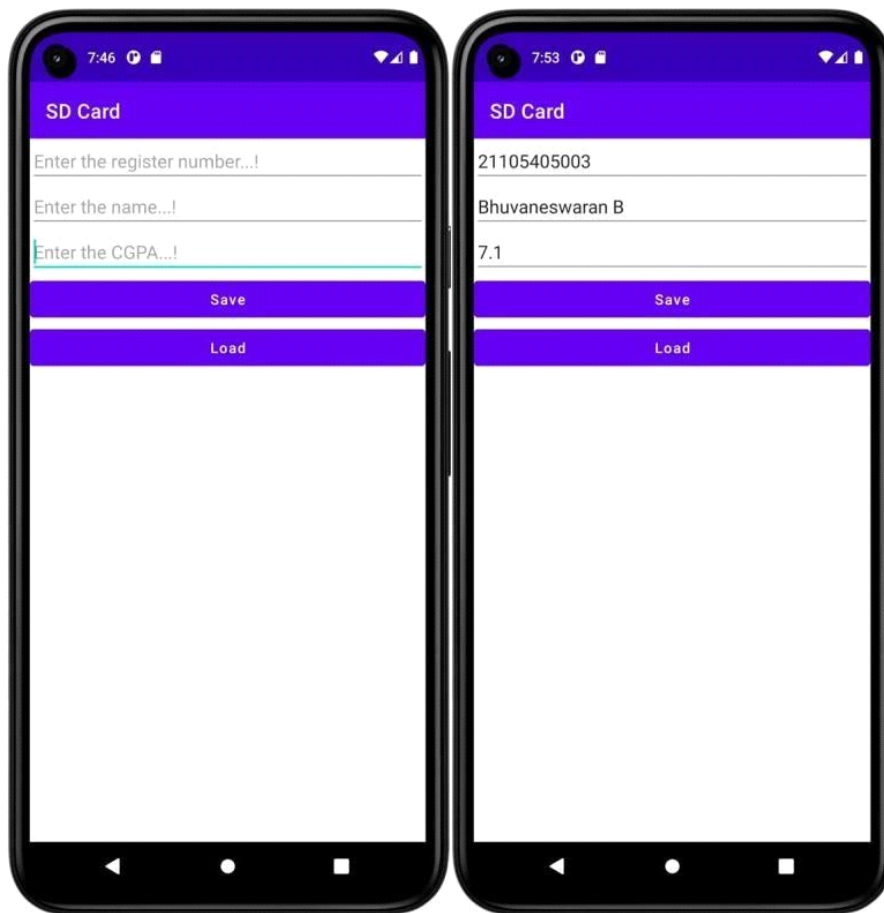
```
        = BufferedReader(inputStreamReader) var line:
        String line = bufferedReader.readLine() val parts
        = line.split(",")
        etRegisterNumber.setText(parts[0])
        etName.setText(parts[1]) etCGPA.setText(parts[2])
        inputStream.close()
    }
  }
}
```

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
<?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_r
        ules" android:fullBackupContent="@xml/backup_rules"
```

```xml
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
```

```xml
        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
<?xml version="1.0" encoding="utf-8"?>
```

```xml
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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/e
        tText"
        android:layout_width="match_par
        ent"
        android:layout_height="wrap_con
        tent" android:ems="10"
        android:hint="Enter the
                    text...!"
        android:inputType="textPersonName" />

    <Button
        android:id="@+id/btDisplay"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent "
        android:text="Display"
        android:textAllCaps="false"
        />
</LinearLayout>
```

MainActivity.kt

```kotlin
package
org.rajalakshmi.alertdialogbox import
androidx.appcompat.app.AppCompatActivi
ty
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)
```

```kotlin
        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.LE
                }
                .setNegativeButton("Cancel") { dialog, which ->
                    Toast.makeText(applicationContext, "You clicked
Cancel", Toast.LENGTH_LONG).show()
                }
                .create()
            alertDialog.show()
        }
    }
}
```
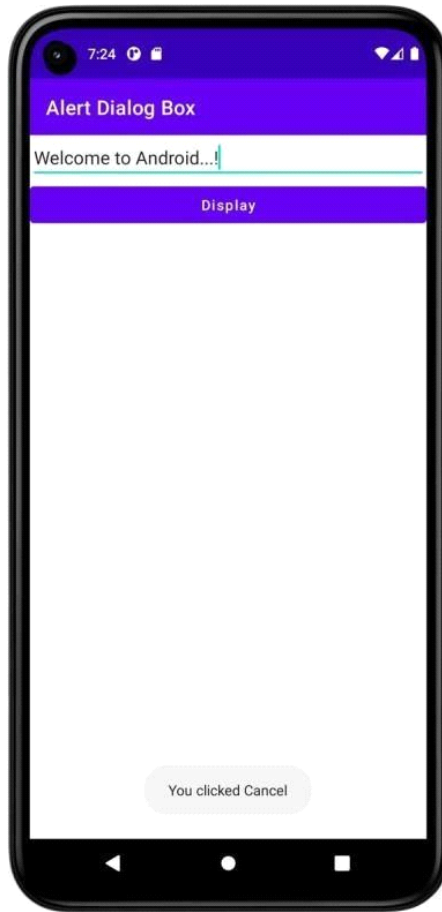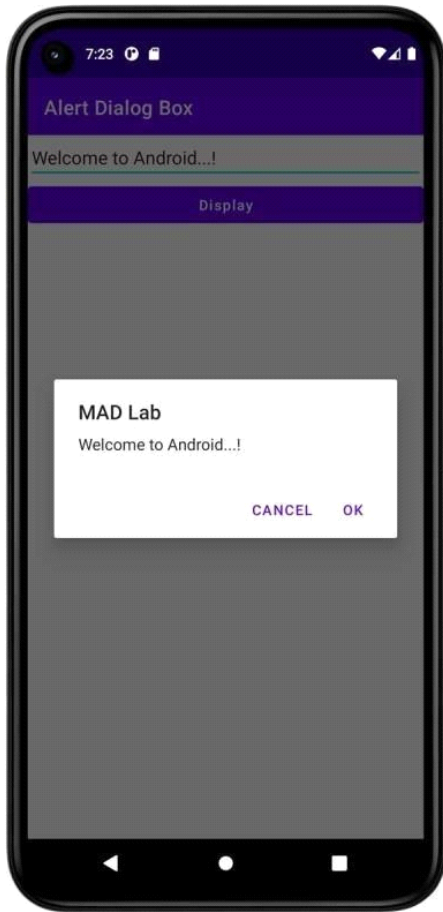
Output

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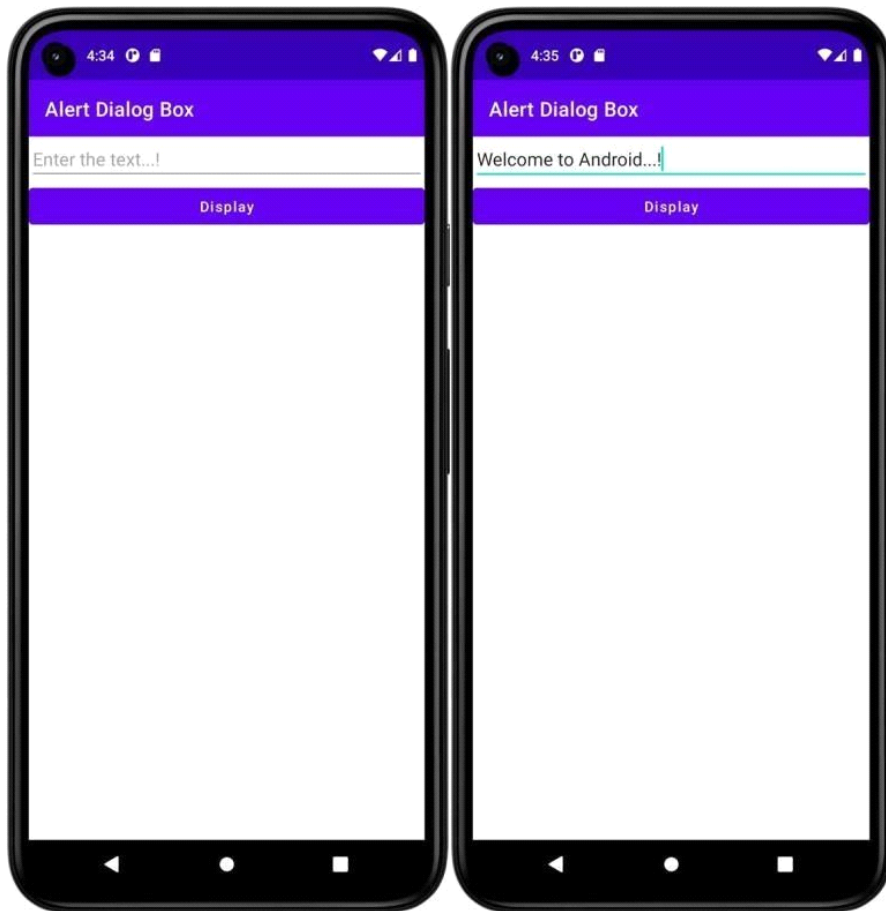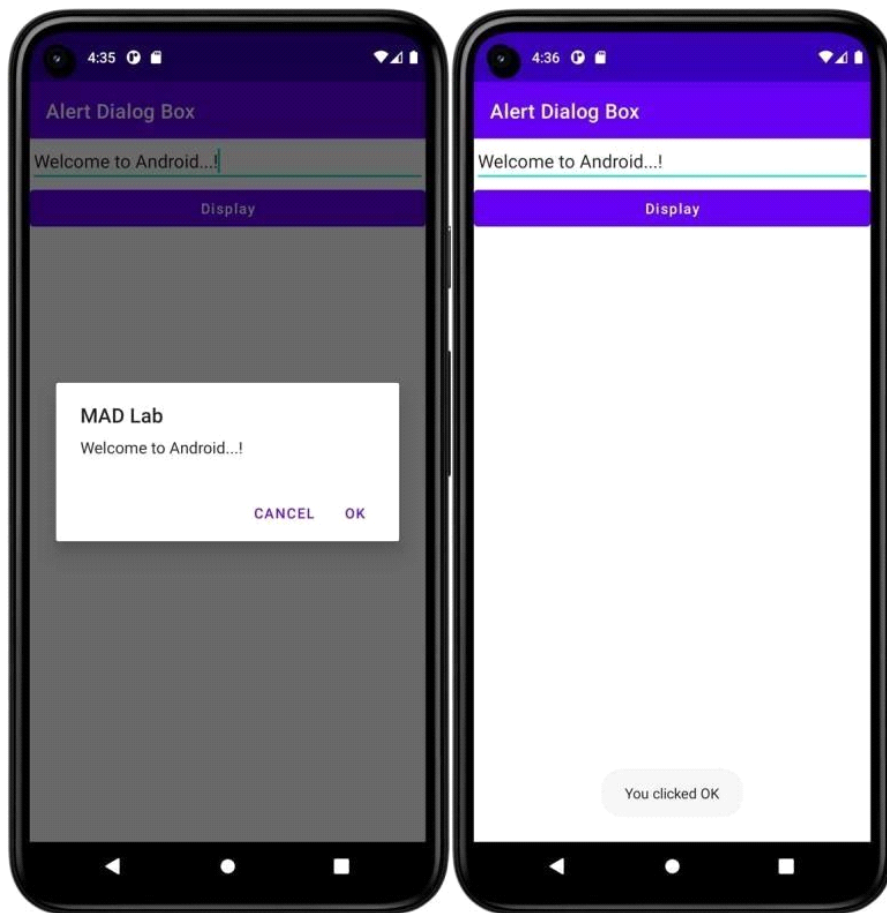
Result

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
<?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_r
        ules" android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
```

```xml
        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
<?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 HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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_p
        arent"
        android:layout_height="wrap_c
```

```xml
        ontent "
        android:layout_gravity="cente
        r"
        />

    <Button
        android:id="@+id/btSetAlarm"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent " android:text="Set
        Alarm"
        android:textAllCaps="false"
        />

    <Button
        android:id="@+id/btnStopAlarm
        "
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent " android:text="Stop
        Alarm"
        android:textAllCaps="false"
        />

</LinearLayout>
```

MainActivity.kt

```kotlin
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.m
            inute) 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)
        }
```

```kotlin
        btStopAlarm.setOnClickListener { alarmManager.cancel(pendingIntent)
            Toast.makeText(applicationContext, "Alarm OFF...!",
Toast.LENGTH_LONG).show()
        }
    }
}
```

AlarmReceiver.kt

```kotlin
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()
    }
}
```

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Output

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
<?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_r
        ules" 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" />
```

```xml
            </intent-filter>
        </activity>
    </application>

</manifest>
```

activity_main.xml

```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 HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
```

```xml
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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_p
        arent"
        android:layout_height="wrap_c
        ontent "  android:text="Phone
        Type" />

    <EditText
        android:id="@+id/etPhoneType"
        android:layout_width="match_par
        ent"
        android:layout_height="wrap_con
        tent " android:ems="10"
        android:inputType="textPersonNa
        me" />

    <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"
```

```xml
        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>
```

and Engineering

MainActivity.kt

```kotlin
package org.rajalakshmi.telephonyservices
import android.content.Context import
android.content.pm.PackageManager
import
androidx.appcompat.app.AppCompatActivi
ty import android.os.Bundle
import
android.telephony.TelephonyMan
ager import
android.widget.Button import
android.widget.EditText
import
androidx.core.app.ActivityComp
at
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
```

```kotlin
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 =
```

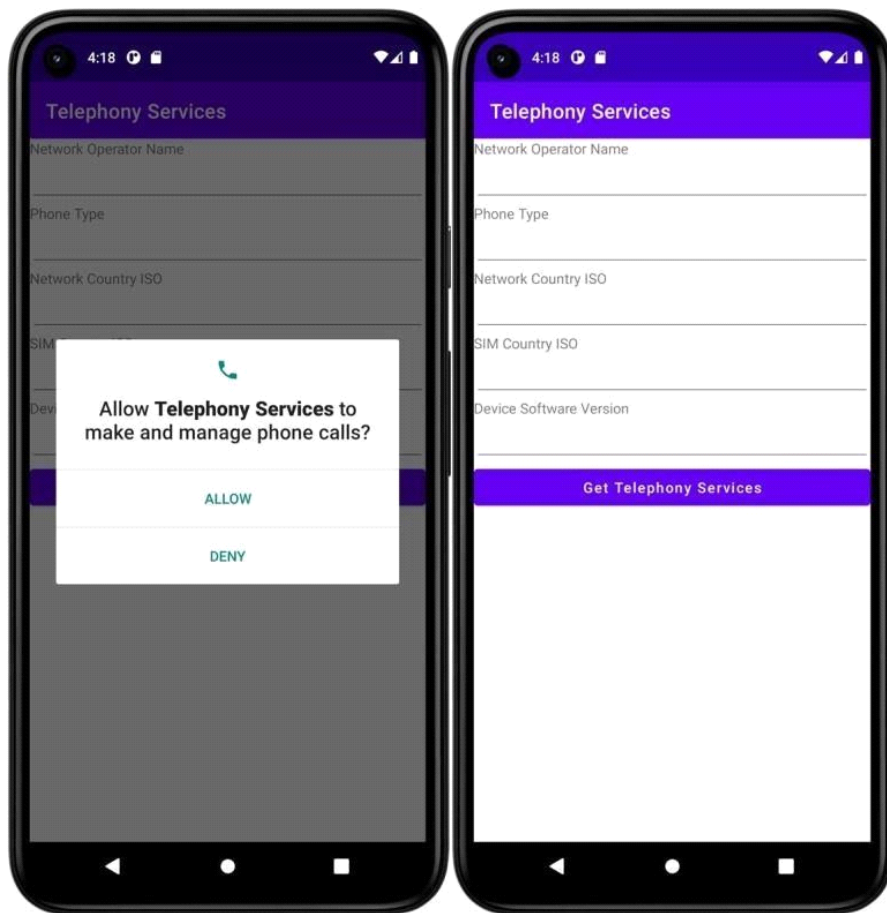```kotlin
telephonyManager.getNetworkCountryIso()
        val SIMCountryISO: String = telephonyManager.getSimCountryIso()
        val
        deviceSoftwareVersion: String? =
telephonyManager.getDeviceSoftwareVersion()

        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)
    }
  }
}
```
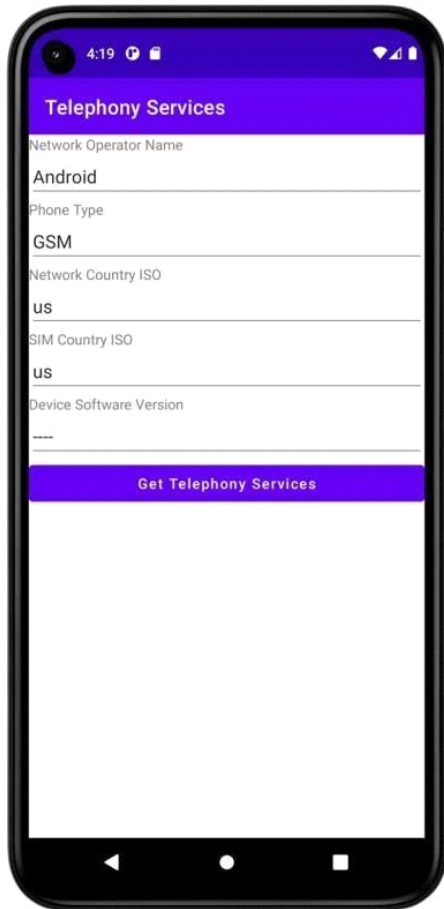
**Output**

**Telephony Services**

Network Operator Name

Phone Type

Network Country ISO

SIM

Dev

📞

**Allow Telephony Services to make and manage phone calls?**

ALLOW

DENY

**Telephony Services**

Network Operator Name

Phone Type

Network Country ISO

SIM Country ISO

Device Software Version

**Get Telephony Services**

**Result**

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

**Register No. :**                                        **Name :**

## Send SMS

**Aim**

Develop an application to send SMS.

**Procedure**

**AndroidManifest.xml**

```xml
<?xml version="1.0" encoding="utf-8"?>
```

```xml
<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"
```

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```xml
        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
<?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 HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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/etPhoneN
        umber"
        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/etMe
        ssage"
        android:layout_width="match_par
        ent"
        android:layout_height="wrap_con
        tent" android:ems="10"
        android:hint="Enter the
                message...!"
        android:inputType="textPersonName" />
```

```xml
<Button android:id="@+id/btSend"
    android:layout_width="match_p
    arent"
    android:layout_height="wrap_c
    ontent " android:text="Send"
    android:textAllCaps="false"
    />
</LinearLayout>
```

MainActivity.kt

```kotlin
package org.rajalakshmi.sendsms
import android.os.Build
import
androidx.appcompat.app.AppCompatActivity
import          android.os.Bundle
                import
android.telephony.SmsManager
                import
```

```kotlin
import android.widget.Button
import android.widget.EditText
import android.widget.Toast
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()
        }
    }
}
```
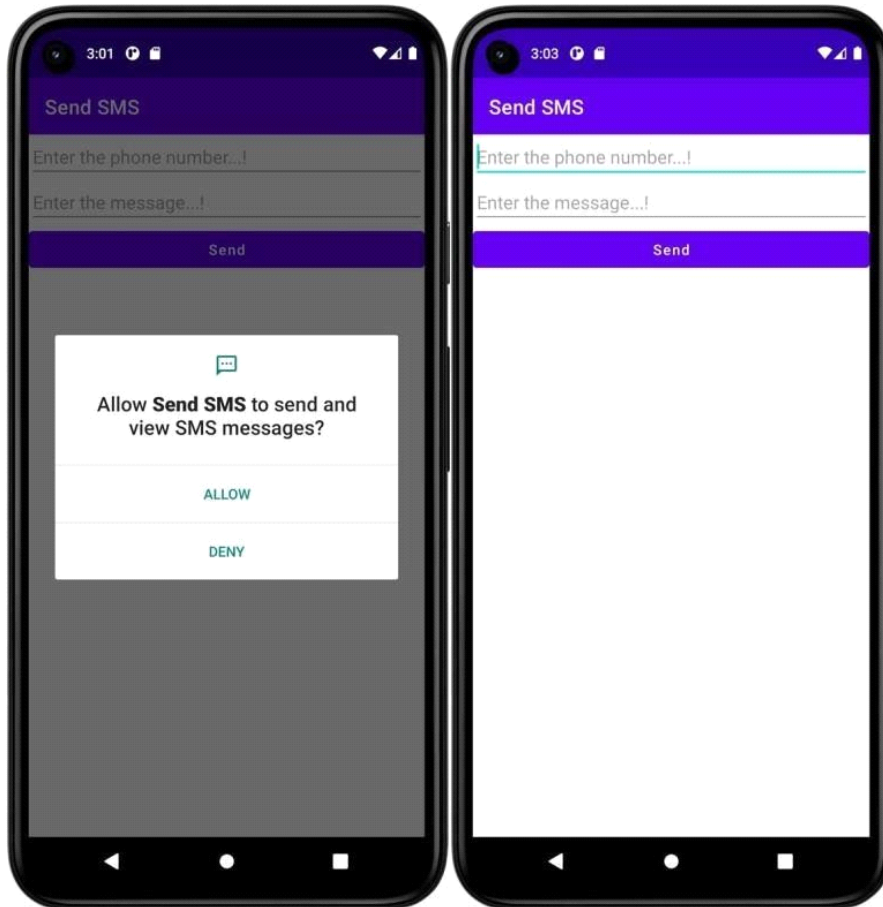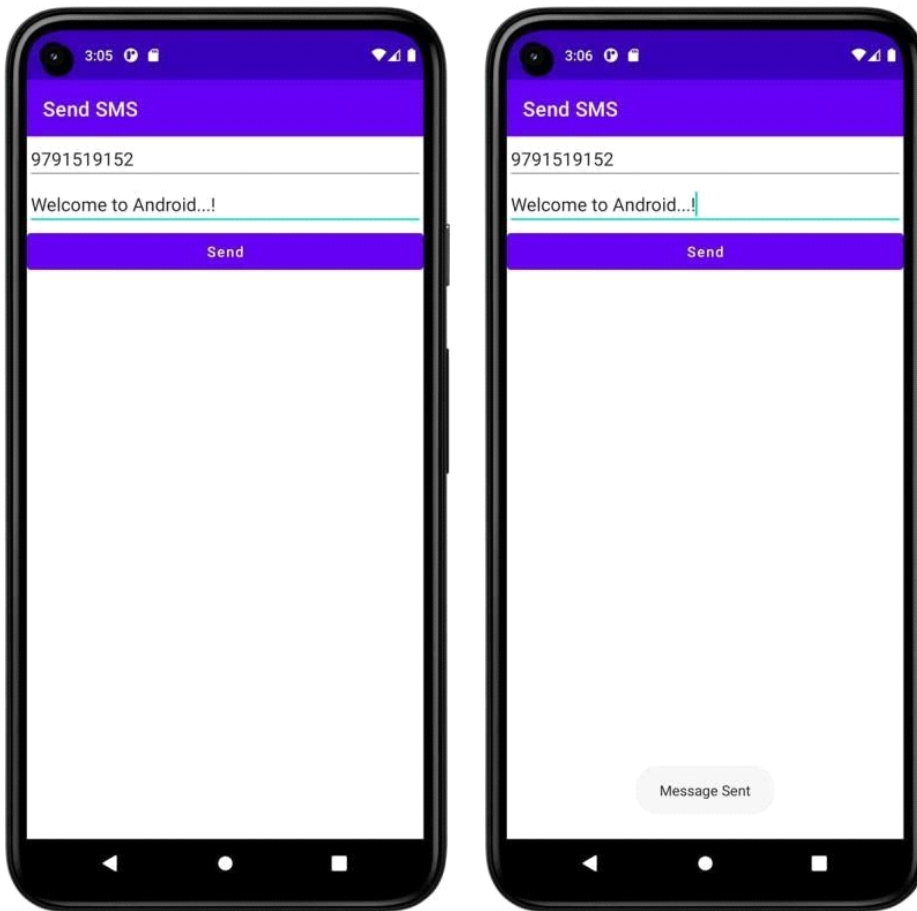
Output

Result

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

Register No. : **Name :**

Send Email

Aim

Develop an application to send Email.

Procedure

AndroidManifest.xml

```xml
<?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_r
        ules" 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
```

```xml
            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
<?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 HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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_p
        arent"
        android:layout_height="wrap_c
        ontent " android:text="To" />

    <EditText android:id="@+id/etEmail"
        android:layout_width="match_par
        ent"
        android:layout_height="wrap_con
        tent  " android:ems="10"
        android:inputType="textPersonNa
        me" />

    <TextView
        android:id="@+id/tvSubject"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent "
        android:text="Subject" />

    <EditText
        android:id="@+id/etSubject"
        android:layout_width="match_par
        ent"
        android:layout_height="wrap_con
        tent  " android:ems="10"
        android:inputType="textPersonNa
        me" />

    <TextView
        android:id="@+id/tvMessage"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent "
        android:text="Message" />

    <EditText
        android:id="@+id/etMessage"
        android:layout_width="match_par
        ent"
```

```xml
            android:layout_height="wrap_con
            tent " android:ems="10"
            android:inputType="textPersonNa
            me" />

        <Button android:id="@+id/btSend"
            android:layout_width="match_p
            arent"
            android:layout_height="wrap_c
            ontent " android:text="Send"
            android:textAllCaps="false"
            />
</LinearLayout>
```

MainActivity.kt

```kotlin
package org.rajalakshmi.sendemail
import android.content.Intent
```

```kotlin
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)
```
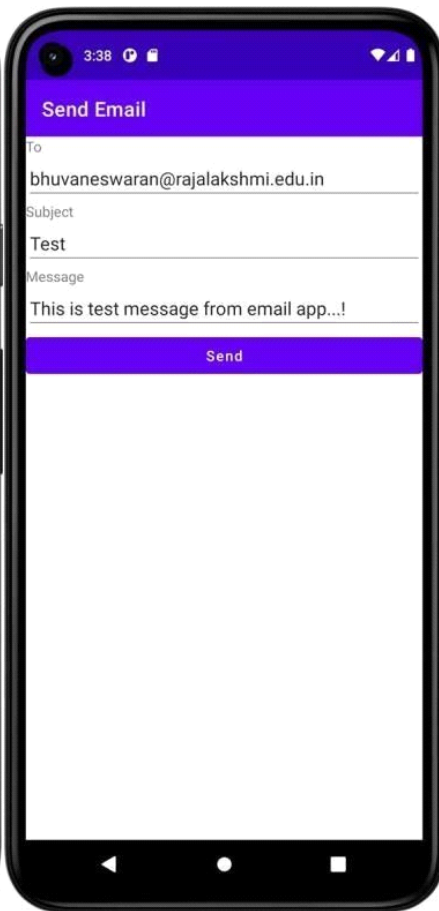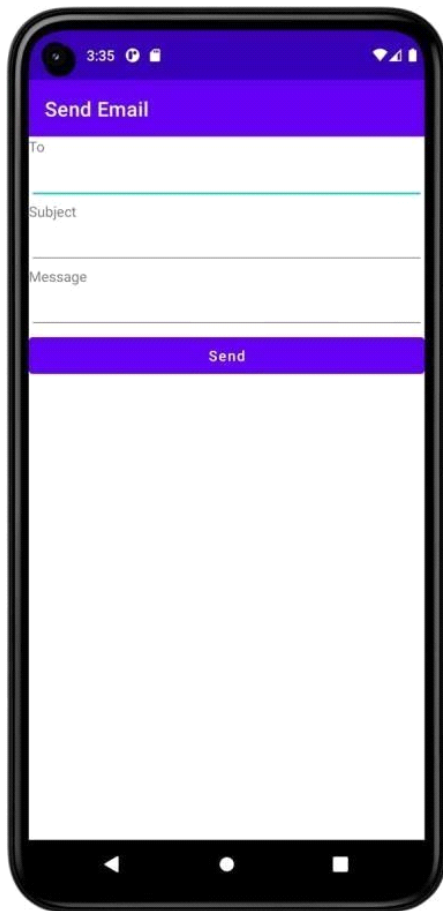
```
                intent.putExtra(Intent.EXTRA_TEXT, message)
   intent.type = "message/rfc822"
                                        startActivity(Intent.createChooser(inten
   t,
"Choose an Email client :"))

           }
      }
  }
```

Output

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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
<?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_r
        ules" 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
<?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 HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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">
```

```xml
<EditText
    android:id="@+id/etText"
    android:layout_width="match_p
    arent"
    android:layout_height="wrap_c
    ontent " android:ems="10"
    android:hint="Enter the
    text..!"
    android:inputType="textPerson
    Name" android:textSize="24sp"
    />

<Button android:id="@+id/btSpeak"
    android:layout_width="match_p
    arent"
    android:layout_height="wrap_c
    ontent " android:text="Speak"
    android:textAllCaps="false"
    android:textSize="24sp" />
</LinearLayout>
```

MainActivity.kt

```kotlin
package org.rajalakshmi.texttospeech
import
```

```kotlin
androidx.appcompat.app.AppCompatAc
tivity
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
            }
        }
    }
}
```
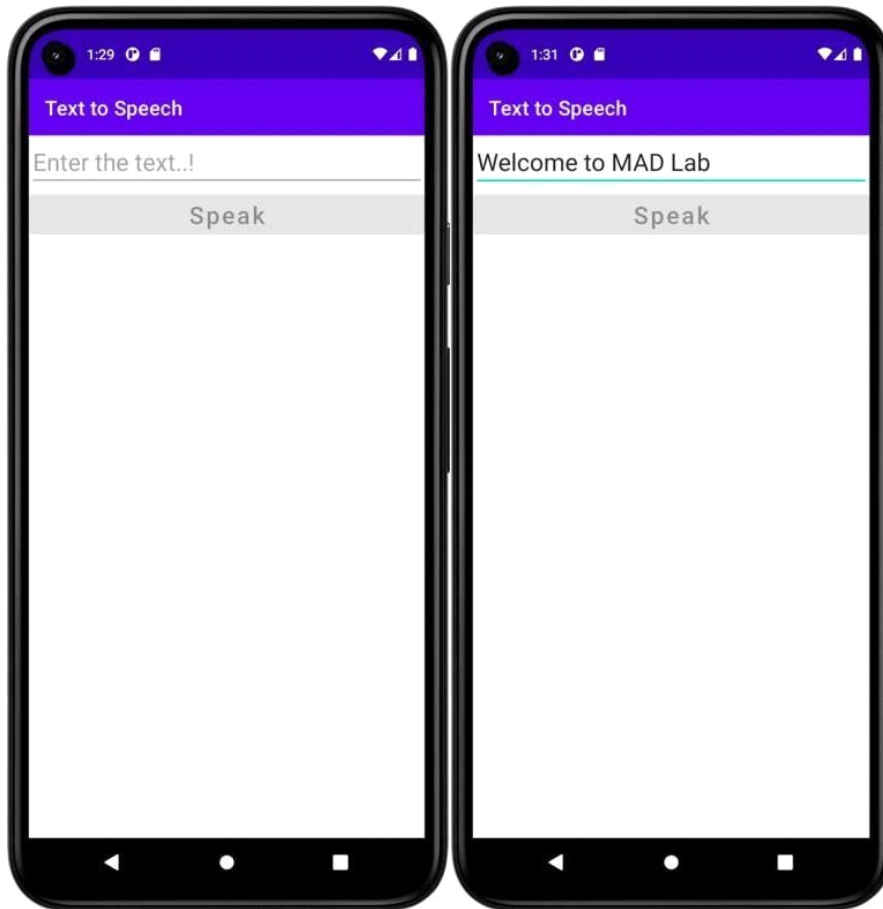
Output

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
<?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_r
        ules" android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
```

```xml
        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
<?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 HYPERLINK
```

```xml
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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/t
        vText"
        android:layout_width="match_pare
        nt"
        android:layout_height="wrap_cont
        ent" android:text="Output
        appears here...!"
        android:textSize="24sp" />
</LinearLayout>
```

MainActivity.kt

```kotlin
package org.rajalakshmi.speechtotext
import android.content.Intent
import         androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import
android.speech.Recognizer
Intent
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_S
        PEECH)
        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(i
        ntent, 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]) }
    }
}
```

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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
<?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_r
        ules" android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportsRtl="true"
```

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```xml
        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
<?xml version="1.0" encoding="utf-8"?>
```

```xml
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res HYPERLINK
    "http://schemas.android.com/apk/res-auto"- HYPERLINK
    "http://schemas.android.com/apk/res-auto"auto HYPERLINK
    "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/btTakePictur
        e"
        android:layout_width="match_p
        arent"
        android:layout_height="wrap_c
        ontent "
        android:inputType="textCapWor
```

```
        ds" android:text="Take
        Picture" />
</LinearLayout>
```

MainActivity.kt

```kotlin
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)
        }
    }
}
```
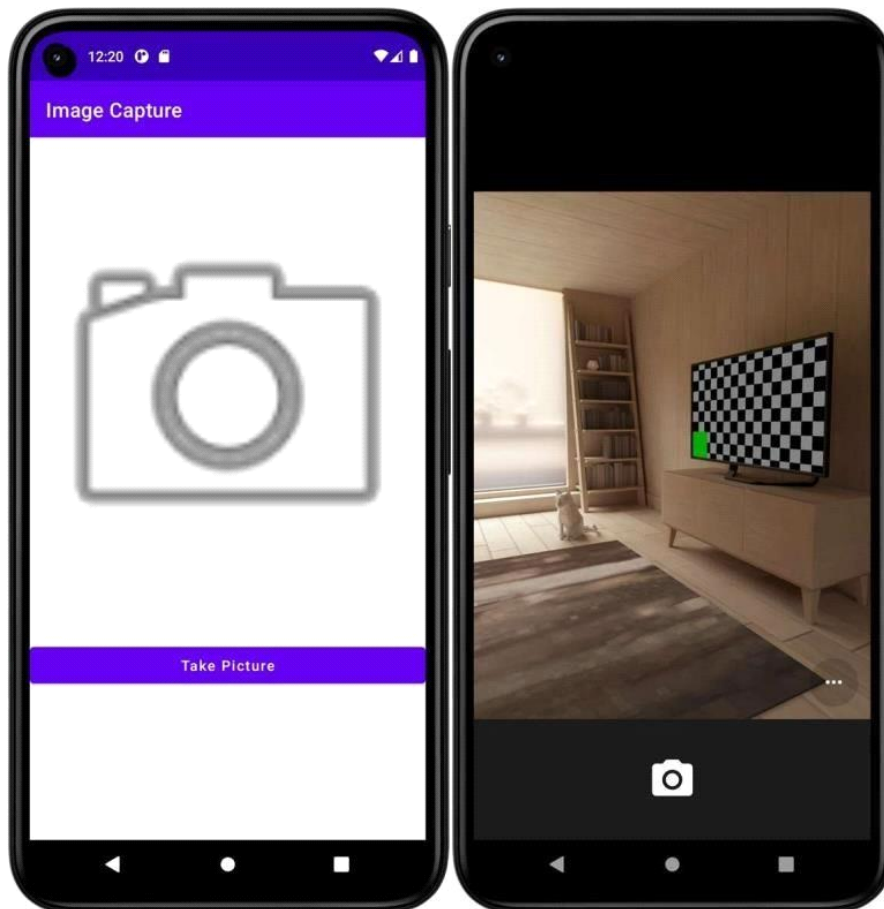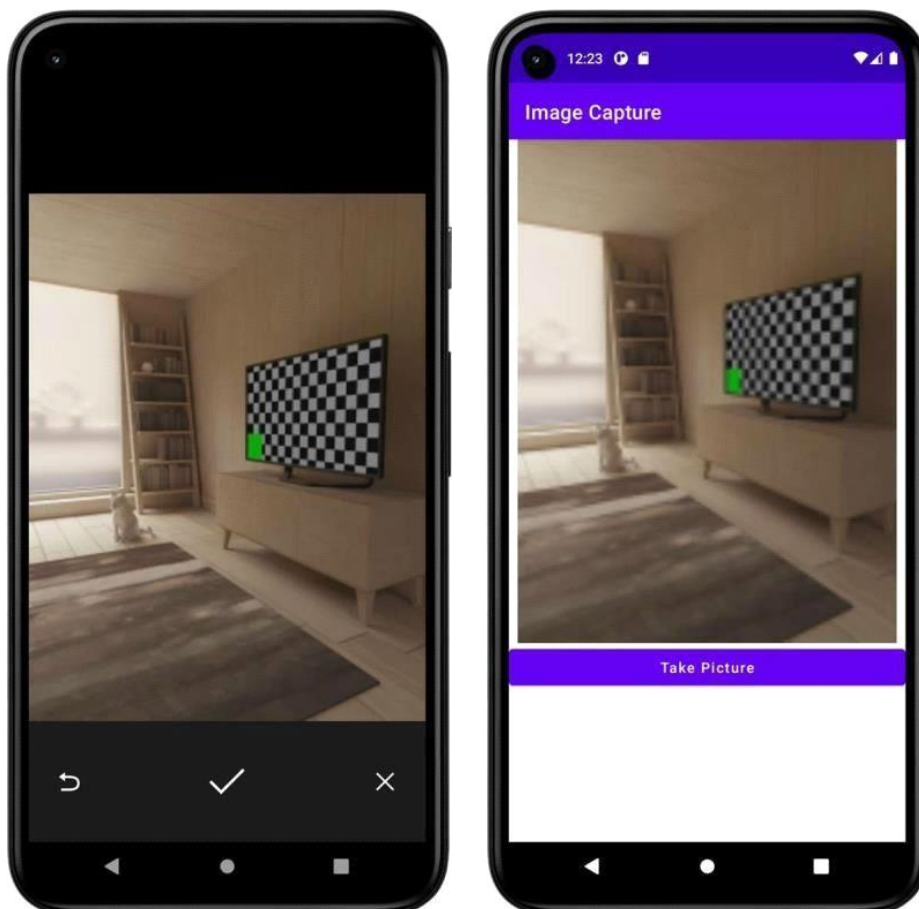
Output

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Result