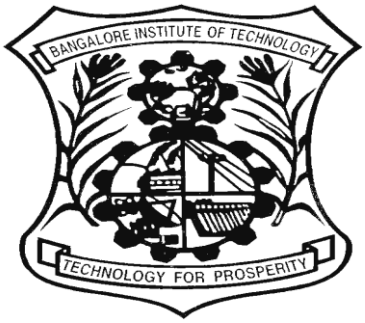
BANGALORE INSTITUTE OF TECHNOLOGY

K.R.ROAD, V.V. PURA, BENGALURU - 560 004



Department of Computer Science and Engineering

18CSMP68

Mobile Application Development Lab Manual

VI- Semester

Prepared By

Dr. B.T. Harish Kumar
Assistant Professor

MOBILE APPLICATION DEVELOPMENT (Effective from the academic year 2022-2023) SEMESTER – VI			
Course Code	**18CSMP68**	**IA Marks**	40
Number of Contact Hours/Week	0:0:2	**Exam Marks**	60
Total Number of Contact Hours	3 Hours/Week	**Exam Hours**	03
CREDITS – 02			

Laboratory Objectives: This laboratory (18CSMP68) will enable students to

- Learn and acquire the art of Android Programming.
- Configure Android studio to run the applications.
- Understand and implement Android's User interface functions.
- Create, modify and query on SQlite database.
- Inspect different methods of sharing data using services.

Descriptions (if any):

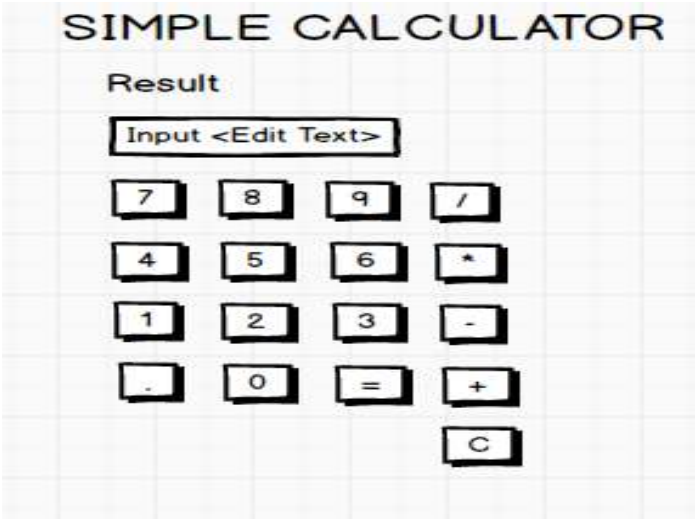
1. **The installation procedure of the Android Studio/Java software must be demonstrated and carried out in groups.**
2. **Students should use the latest version of Android Studio/Java/ Kotlin to execute these programs. Diagrams given are for representational purposes only, students are expected to improvise on them.**
3. **Part B programs should be developed as an application and are to be demonstrated as a mini project in a group by adding extra features or the students can also develop their application and demonstrate it as a mini-project. (Projects/programs are not limited to the list given in Part B).**

Programs List:

PART – A

1 Create an application to design a Visiting Card. The Visiting card should have a company logo at the top right corner. The company name should be displayed in Capital letters, aligned to the center. Information like the name of the employee, job title, phone number, address, email, fax and the website address is to be displayed. Insert a horizontal line between the job title and the phone number.

2 Develop an Android application using controls like Button, Text View, Edit Text for designing a calculator having basic functionality like Addition, Subtraction, Multiplication, and Division.

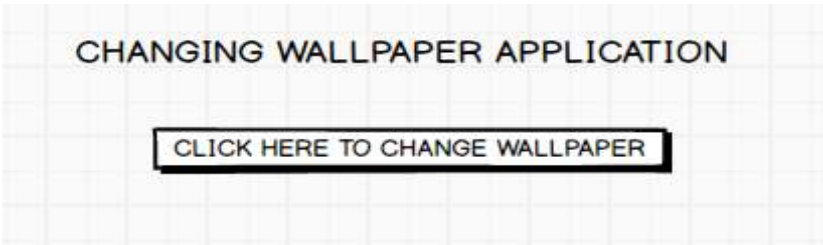


3 Create a SIGN Up activity with Username and Password. Validation of password should happen based on the following rules:

- Password should contain uppercase and lowercase letters.
- Password should contain letters and numbers.
- Password should contain special characters.
- Minimum length of the password (the default value is 8).

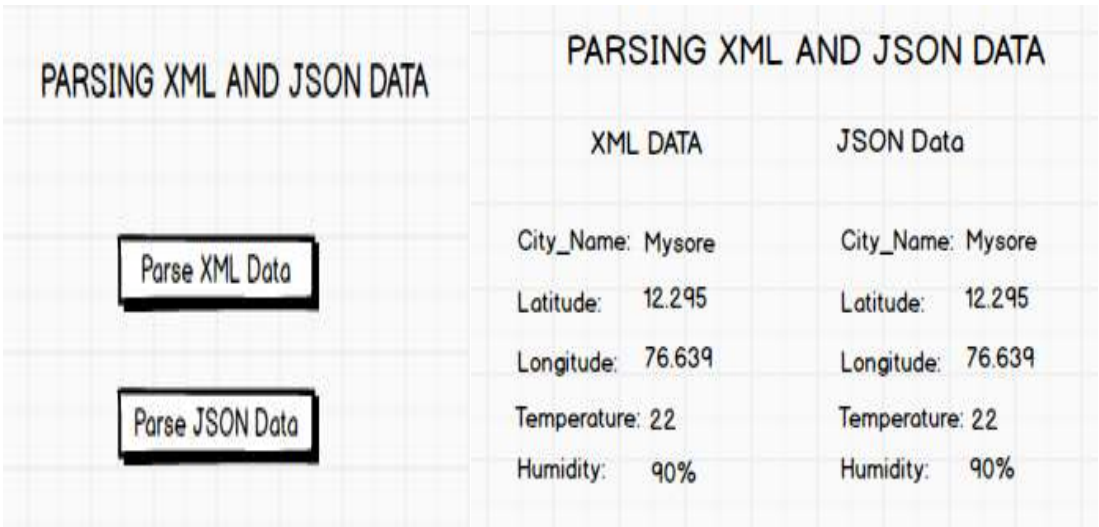
On successful **SIGN UP** proceed to the next Login activity. Here the user should **SIGN IN** using the Username and Password created during signup activity. If the Username and Password are matched then navigate to the next activity which displays a message saying "Successful Login" or else display a toast message saying "Login Failed". The user is given only two attempts and after that display a toast message saying "Failed Login Attempts" and disable the SIGN IN button. Use Bundle to transfer information from one activity to another.

4 Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 seconds.



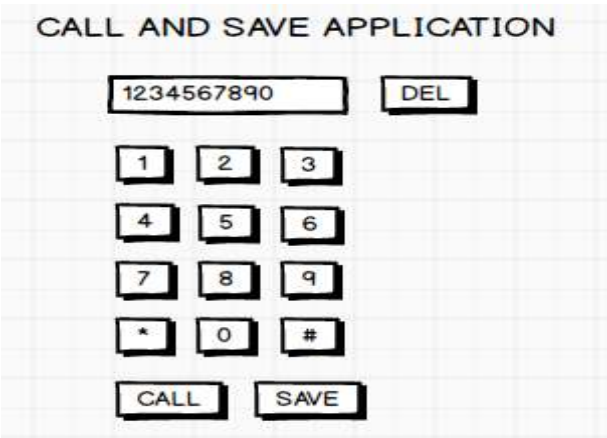
5 Write a program to create an activity with two buttons START and STOP. On pressing of the START button, the activity must start the counter by displaying the numbers from One and the counter must keep on counting until the STOP button is pressed. Display the counter value in a Text View control.

6 Create two files of XML and JSON type with values for City_Name, Latitude, Longitude, Temperature, and Humidity. Develop an application to create an activity with two buttons to parse the XML and JSON files which when clicked should display the data in their respective layouts side by side.



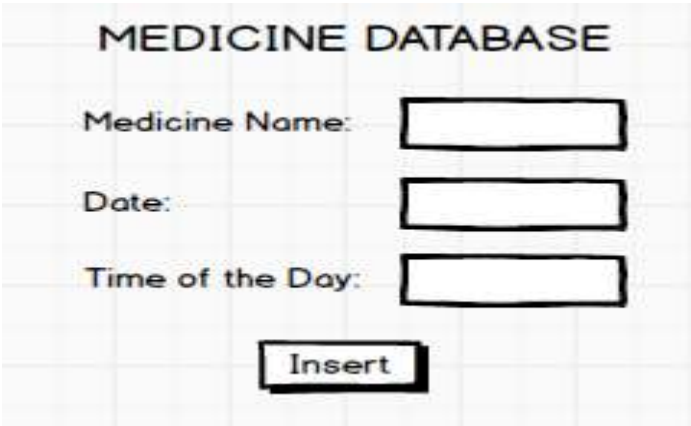
7 Develop a simple application with one Edit Text so that the user can write some text in it. Create a button called "Convert Text to Speech" that converts the user input text into voice.

8 Create an activity like a phone dialer with CALL and SAVE buttons. On pressing the CALL button, it must call the phone number and on pressing the SAVE button it must save the number to the phone contacts.

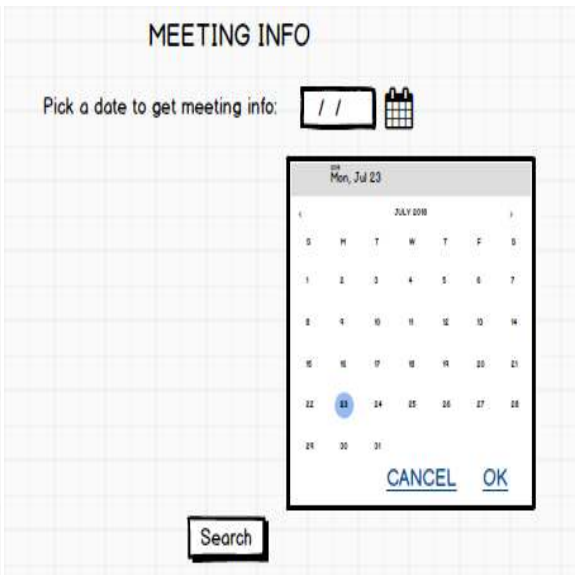


PART-B

1 Write a program to enter Medicine Name, Date and Time of the Day as input from the user and store it in the SQLite database. Input for Time of the Day should be either Morning or Afternoon or Evening or Night. Trigger an alarm based on the Date and Time of the Day and display the Medicine Name.

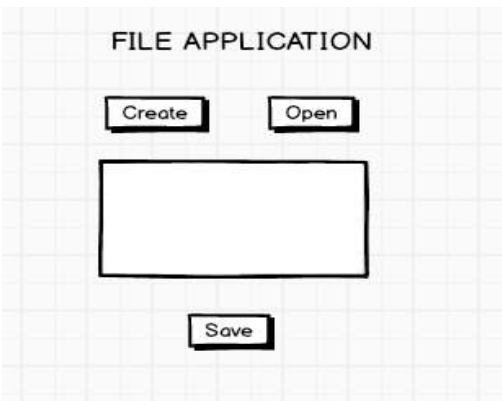


2 Develop a content provider application with an activity called "Meeting Schedule" which takes Date, Time and Meeting Agenda as input from the user and store this information into the SQLite database. Create another application with an activity called "Meeting Info" having DatePicker control, which on the selection of a date should display the Meeting Agenda information for that particular date, else it should display a toast message saying "No Meeting on this Date".

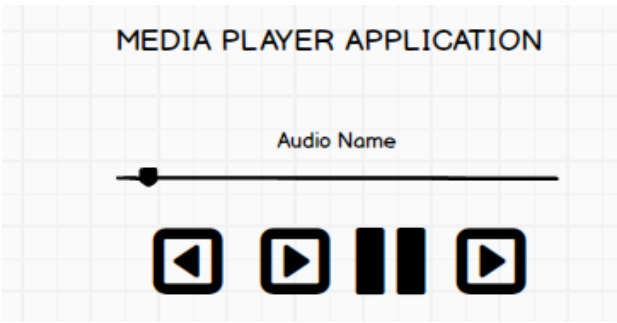


3 Create an application to receive an incoming SMS which is notified to the user. On clicking this SMS notification, the message content and the number should be displayed on the screen. Use appropriate emulator control to send the SMS message to your application.

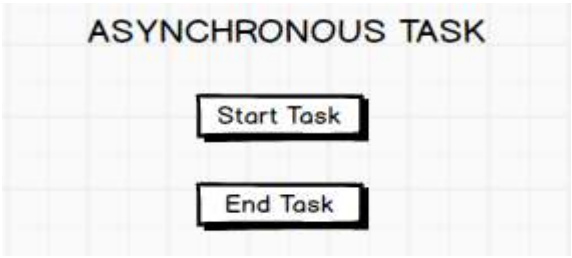
4 Write a program to create an activity having a Text box, and also Save, Open and Create buttons. The user has to write some text in the Text box. On pressing the Create button the text should be saved as a text file in MkSDcard. On subsequent changes to the text, the Save button should be pressed to store the latest content to the same file. On pressing the Open button, it should display the contents from the previously stored files in the Text box. If the user tries to save the contents in the Textbox to a file without creating it, then a toast message has to be displayed saying "First Create a File".



5 Create an application to demonstrate a basic media player that allows the user to Forward, Backward, Play and Pause an audio. Also, make use of the indicator in the seek bar to move the audio forward or backward as required.



6 Develop an application to demonstrate the use of Asynchronous tasks in android. The asynchronous task should implement the functionality of a simple moving banner. On pressing the **Start Task** button, the banner message should scroll from right to left. On pressing the **Stop Task** button, the banner message should stop. Let the banner message be "Demonstration of Asynchronous Task".



7 Develop an application that makes use of the clipboard framework for copying and pasting of the text. The activity consists of two Edit Text controls and two Buttons to trigger the copy and paste functionality.

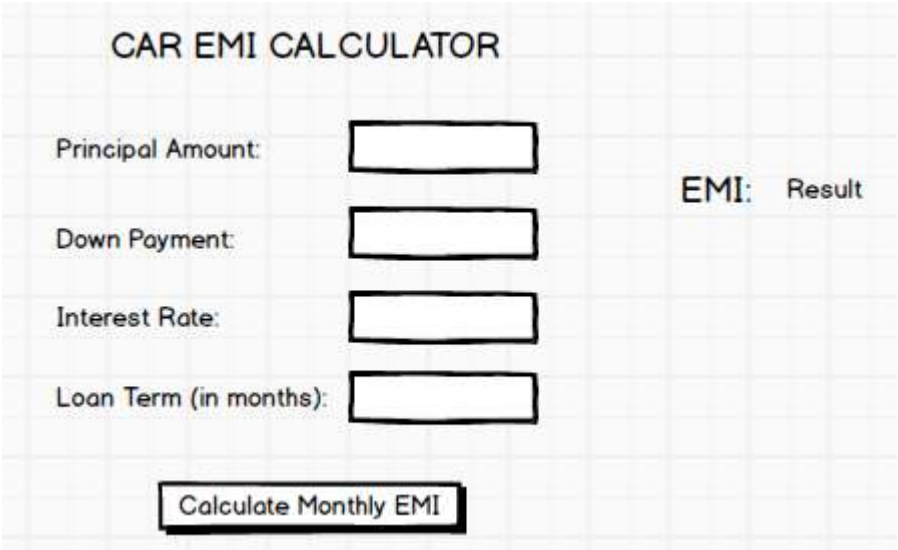
8 Create an AIDL service that calculates Car Loan EMI. The formula to calculate EMI is

$$\mathbf{E = P * (r(1+r)^n)/((1+r)^n-1)}$$

where

E = The EMI payable on the car loan amount
P = The Car loan Principal Amount
r = The interest rate value computed on a monthly basis
n = The loan tenure in the form of months

The down payment amount has to be deducted from the principal amount paid towards buying the Car. Develop an application that makes use of this AIDL service to calculate the EMI. This application should have four Edit Text to read the Principal Amount, Down Payment, Interest Rate, Loan Term (in months) and a button named as "Calculate Monthly EMI". On click of this button, the result should be shown in a Text View. Also, calculate the EMI by varying the Loan Term and Interest Rate values.



Laboratory Outcomes: After studying these laboratory programs, students will be able to

- Create, test and debug Android application by setting up Android development environment.
- Implement adaptive, responsive user interfaces that work across a wide range of devices.
- Infer long running tasks and background work in Android applications.
- Demonstrate methods in storing, sharing and retrieving data in Android applications.
- Infer the role of permissions and security for Android applications.

Procedure to Conduct Practical Examination

- Experiment distribution
  - For laboratories having only one part: Students are allowed to pick one experiment from the lot with equal opportunity.
  - For laboratories having PART A and PART B: Students are allowed to pick one experiment from PART A and one experiment from PART B, with equal opportunity.

- Change of experiment is allowed only once and marks allotted for procedure to be made zero of the changed part only.

- Marks Distribution (Coursed to change in accordance with university regulations)
  - For laboratories having only one part – Procedure + Execution + Viva-Voce: 15+70+15= 100 Marks
  - For laboratories having PART A and PART B
    i. Part A – Procedure + Execution + Viva = 6 + 28 + 6 = 40 Marks

    ii. Part B – Procedure + Execution + Viva = 9 + 42 + 9 = 60 Marks

Text Books:

1. Google Developer Training, **"Android Developer Fundamentals Course – Concept Reference",** Google Developer Training Team, 2017. https://www.gitbook.com/book/google-developer-training/android-developer-fundamentals- course-concepts/details
(Download pdf file from the above link)

Reference Books:

1. Erik Hellman, **"Android Programming – Pushing the Limits",** 1st Edition, Wiley India Pvt Ltd, 2014. ISBN-13: 978-8126547197
2. Dawn Griffiths and David Griffiths, **"Head First Android Development",** 1st Edition, O'Reilly SPD Publishers, 2015. ISBN-13: 978-9352131341
3. Bill Phillips, Chris Stewart and Kristin Marsicano, **"Android Programming: The Big Nerd Ranch Guide",** 3rd Edition, Big Nerd Ranch Guides, 2017. ISBN-13: 978-0134706054

Program No.1:

Create an application to design a Visiting Card. The Visiting card should havea company logo at the top right corner. The company name should be displayed in Capital letters, aligned to the center. Information like the name of the employee, job title, phone number, address, email, fax and the website address is to be displayed. Insert a horizontal line between the job title and the phone number.

XML Code - Activity_Main.xml

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="354dp"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_marginBottom="731dp"
        android:layout_marginEnd="126dp"
        android:layout_marginRight="126dp"
        android:text="BANGALORE INSTITUTE OF TECHNOLOGY"
        android:textAlignment="center"
        android:textColor="#ff00"
        android:textSize="25sp" />
    <ImageView
        android:id="@+id/imageView"
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_marginBottom="721dp"
    android:layout_marginEnd="17dp"
    android:layout_marginRight="17dp"
    app:srcCompat="@drawable/bitlogo"
    />

<View
    android:id="@+id/view"
    android:layout_width="match_parent"
    android:layout_height="4dp"
    android:layout_alignParentBottom="true"
    android:layout_marginBottom="698dp"
    android:background="#4444"
    />

<TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_marginBottom="652dp"
    android:layout_marginEnd="144dp"
    android:layout_marginRight="144dp"
    android:text="Dr. Harish Kumar B T"
    android:textAlignment="center"
    android:textColor="#3700b3"
    android:textSize="20sp"
    />

<TextView
    android:id="@+id/textView3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_marginBottom="603dp"
    android:layout_marginEnd="157dp"
    android:layout_marginRight="157dp"
    android:text="Assistant Professor"
    android:textAlignment="center"
    android:textSize="18sp"
    />
```

```
    <TextView
        android:id="@+id/textView4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_marginBottom="556dp"
        android:layout_marginEnd="163dp"
        android:layout_marginRight="163dp"
        android:text="Mob:  9980119894"
        android:textAlignment="center"
        android:textColor="#b00020"
        android:textSize="18sp"  />

    <TextView
        android:id="@+id/textView5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_marginBottom="510dp"
        android:layout_marginEnd="50dp"
        android:layout_marginRight="50dp"
        android:text="Email  ID: harishkumarbt@bit-bangalore.edu.in"
        android:textAlignment="center"
        android:textColor="#3700b3"
        android:textSize="18sp"
       />
</RelativeLayout>
```

Design Output:

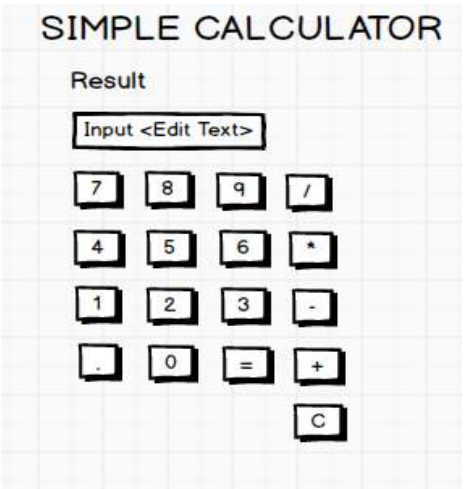
JAVA Coding: Activity_Main.java

```
package com.example.labpgm1;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
}
```

Output:

Program No.2:

Develop an Android application using controls like Button, TextView, EditText for designing a calculator having basic functionality like Addition, Subtraction, Multiplication and Division.



XML Code: Activity_Main.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="SIMPLE CALCULATOR"
        android:textSize="30sp"
        android:textColor="@color/design_default_color_primary_dark"
        android:textAlignment="center"
        />

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter First Number"
        android:id="@+id/num1"
        android:textSize="20sp"
        android:textAlignment="center"
        />
```

```
 <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Enter  Second Number"
      android:id="@+id/num2"
      android:textSize="20sp"
      android:textAlignment="center"
      />

   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Result"
      android:id="@+id/result"
      android:textSize="20sp"
      android:textAlignment="center"
      />
<LinearLayout
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_gravity="center"
   android:orientation="horizontal">

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:id="@+id/seven"
      android:text="7"
      android:textAlignment="center"

      android:onClick="seven"
      />

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:id="@+id/eight"
      android:text="8"
      android:textAlignment="center"
      android:onClick="eight"
      />

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:id="@+id/nine"
      android:text="9"
      android:textAlignment="center"
      android:onClick="nine"
      />
```

```
<Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/divide"
        android:text="/"
        android:textAlignment="center"
        android:onClick="divide"
        />

</LinearLayout>

    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        android:layout_gravity="center">

        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/four"
            android:text="4"
            android:textAlignment="center"
            android:onClick="four"
            />

         <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/five"
            android:text="5"
            android:textAlignment="center"
            android:onClick="five"
            />

        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/six"
            android:text="6"
            android:textAlignment="center"
            android:onClick="six"
            />

        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/multiply"
            android:text="*"
            android:textAlignment="center"
            android:onClick="multiply"
            />
 </LinearLayout>
```

```
<LinearLayout
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:orientation="horizontal"
   android:layout_gravity="center">

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:id="@+id/one"
      android:text="1"
      android:textAlignment="center"
      android:onClick="one"
      />

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:id="@+id/two"
      android:text="2"
      android:textAlignment="center"
      android:onClick="two"
      />

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:id="@+id/three"
      android:text="3"
      android:textAlignment="center"
      android:onClick="three"
      />

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:id="@+id/add"
      android:text="+"
      android:textAlignment="center"
      android:onClick="add"
      />

</LinearLayout>

<LinearLayout
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:orientation="horizontal"
   android:layout_gravity="center">

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
```

```
        android:id="@+id/dot"
        android:text="."
        android:textAlignment="center"
        android:onClick="dot"
        />

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/zero"
        android:text="0"
        android:textAlignment="center"
        android:onClick="zero"
        />

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/equals"
        android:text="="
        android:textAlignment="center"
        android:onClick="compute"
        />

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/minus"
        android:text="-"
        android:textAlignment="center"
        android:onClick="sub"
        />

</LinearLayout>

<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:layout_gravity="center">

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/clear_one_digit_at_a_time"
        android:text="C"
        android:textAlignment="center"
        android:onClick="clear_one_digit_at_a_time"
        />

        <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:id="@+id/clear_one_field_completely"
        android:text="CE"
        android:textAlignment="center"
        android:onClick="clear_one_field_completely"
        />

        <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/All_Clear"
        android:text="AC"
        android:textAlignment="center"
        android:onClick="All_Clear"
        />

    </LinearLayout>
</LinearLayout>
```

Design Output:

Java Coding Part: ActivityMain.java

```
package com.example.labpgm2;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
EditText number1,number2;
TextView res;
char op;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        number1=findViewById(R.id.num1);
        number2=findViewById(R.id.num2);
        res=findViewById(R.id.result);

    }

    public void one(View v)
    {
        if(number1.hasFocus())
        {
            number1.append("1");
        }
        else if(number2.hasFocus())
        {
            number2.append("1");
        }

        else {
            Toast.makeText(this, "Please get the focus of First/Second Number field",
Toast.LENGTH_LONG).show();
        }

    }

    public void two(View v)
    {
        if(number1.hasFocus())
        {
            number1.append("2");
        }
```

```
    else if(number2.hasFocus())
    {
      number2.append("2");
    }
    else {
      Toast.makeText(this, "Please get the focus of First/Second Number field",
Toast.LENGTH_LONG).show();
    }
  }

  public void three(View v)
  {
    if(number1.hasFocus())
    {
      number1.append("3");
    }
    else if(number2.hasFocus())
    {
      number2.append("3");
    }
    else {
      Toast.makeText(this, "Please get the focus of First/Second Number field",
Toast.LENGTH_LONG).show();
    }
  }

  public void four(View v)
  {
    if(number1.hasFocus())
    {
      number1.append("4");
    }
    else if(number2.hasFocus())
    {
      number2.append("4");
    }
    else {
      Toast.makeText(this, "Please get the focus of First/Second Number field",
Toast.LENGTH_LONG).show();
    }
  }


  public void five(View v)
  {
    if(number1.hasFocus())
    {
      number1.append("5");
    }
    else if(number2.hasFocus())
```

```
    {
      number2.append("5");
    }
    else {
      Toast.makeText(this, "Please get the focus of First/Second Number field",
Toast.LENGTH_LONG).show();
    }
  }

  public void six(View v)
  {
    if(number1.hasFocus())
    {
      number1.append("6");
    }
    else if(number2.hasFocus())
    {
      number2.append("6");
    }
    else {
      Toast.makeText(this, "Please get the focus of First/Second Number field",
Toast.LENGTH_LONG).show();
    }
  }

  public void seven(View v)
  {
    if(number1.hasFocus())
    {
      number1.append("7");
    }
    else if(number2.hasFocus())
    {
      number2.append("7");
    }
    else {
      Toast.makeText(this, "Please get the focus of First/Second Number field",
Toast.LENGTH_LONG).show();
    }
  }

  public void eight(View v)
  {
    if(number1.hasFocus())
    {
      number1.append("8");
    }
    else if(number2.hasFocus())
    {
      number2.append("8");
```

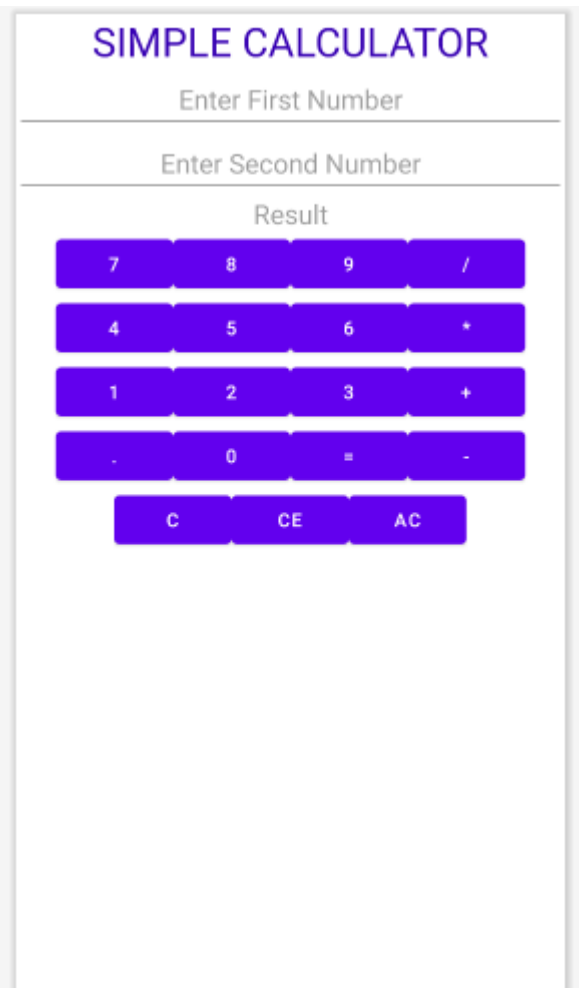
```
        }
        else {
            Toast.makeText(this, "Please get the focus of First/Second Number field",
Toast.LENGTH_LONG).show();
        }

    }

    public void nine(View v)
    {
        if(number1.hasFocus())
        {
            number1.append("9");
        }
        else if(number2.hasFocus())
        {
            number2.append("9");
        }
        else {
            Toast.makeText(this, "Please get the focus of First/Second Number field",
Toast.LENGTH_LONG).show();
        }
    }

    public void zero(View v)
    {
        if(number1.hasFocus())
        {
            number1.append("0");
        }
        else if(number2.hasFocus())
        {
            number2.append("0");
        }
        else {
            Toast.makeText(this, "Please get the focus of First/Second Number field",
Toast.LENGTH_LONG).show();
        }
    }

    public void dot(View v)
    {
        if(number1.hasFocus())
        {
            number1.append(".");
        }
        else if(number2.hasFocus())
        {
            number2.append(".");
        }
```

```
    else {
      Toast.makeText(this, "Please get the focus of First/Second Number field",
Toast.LENGTH_LONG).show();
    }
  }

  public void add(View v)
  {
    op='+';
  }

  public void sub(View v)
  {
    op='-';
  }

  public void multiply(View v)
  {
    op='*';
  }

  public void divide(View v)
  {
    op='/';
  }

  public void compute(View v)
  {
    float n1,n2,r;
    switch(op)
    {
      case '+': n1=Float.parseFloat(number1.getText().toString());
                n2=Float.parseFloat(number2.getText().toString());
                r=n1+n2;
                res.setText(""+n1+"+"+n2+"="+r);
                break;
      case '-': n1=Float.parseFloat(number1.getText().toString());
                n2=Float.parseFloat(number2.getText().toString());
                r=n1-n2;
                res.setText(""+n1+"-"+n2+"="+r);
                break;
      case '*': n1=Float.parseFloat(number1.getText().toString());
                n2=Float.parseFloat(number2.getText().toString());
                r=n1*n2;
                res.setText(""+n1+"*"+n2+"="+r);
                break;
      case '/': n1=Float.parseFloat(number1.getText().toString());
                n2=Float.parseFloat(number2.getText().toString());
                r=n1/n2;
                res.setText(""+n1+"/"+n2+"="+r);
```

```
                break;
        }
    }

    public void All_Clear(View v)
    {
        number1.setText("");
        number2.setText("");
        res.setText("");
    }

    public void clear_one_field_completely(View v)
    {
        if(number1.hasFocus())
        {
            number1.setText("");
            res.setText("");
        }
        else if(number2.hasFocus())
        {
            number2.setText("");
            res.setText("");
        }

        else
        {
            Toast.makeText(this, "Please click on Number1/Number2 Field",
Toast.LENGTH_LONG).show();
        }
    }

    public void clear_one_digit_at_a_time(View v)
    {
        if(number1.hasFocus())
        {
            String n;
            n=number1.getText().toString();
           // n=n.substring(0,n.length()-1);    /// deletes digits from right to left
            n=n.substring(1,n.length());  // deletes digits from left to right
            number1.setText(n);
        }

        else if(number2.hasFocus())
        {
            String n;
            n=number2.getText().toString();
            // n=n.substring(0,n.length()-1);    /// deletes digits from right to left
            n=n.substring(1,n.length());  // deletes digits from left to right
            number2.setText(n);
        }
```

```
        else
        {
            Toast.makeText(this, "Please click on Number1/Number2 Field",
Toast.LENGTH_LONG).show();
        }
    }

    }
```

Output:




2:49
cal
SIMPLE CALCULATOR
1234
0
1234.0/0.0=Infinity
7 8 9 /
4 5 6 *
1 2 3 +
. 0 = -
C CE AC

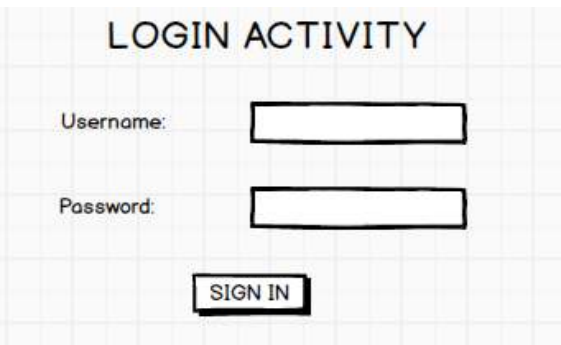

2:50
cal
SIMPLE CALCULATOR
125.256
125.658
125.256*125.658=15739.418
7 8 9 /
4 5 6 *
1 2 3 +
. 0 = -
C CE AC

Program 3:

Create a SIGN Up activity with Username and Password. Validation of password should happen based on the following rules:

- Password should contain uppercase and lowercase letters.
- Password should contain letters and numbers.
- Password should contain special characters.
- Minimum length of the password (the default value is 8).

On successful **SIGN UP** proceed to the next Login activity. Here the user should **SIGN IN** using the Username and Password created during signup activity. If the Username and Password are matched then navigate to the next activity whichdisplays a message saying "Successful Login" or else display a toast message saying "Login Failed".The user is given only two attempts and after thatdisplay a toast message saying "Failed Login Attempts" and disable the SIGN IN button. Use Bundle to transfer information from one activity to another.

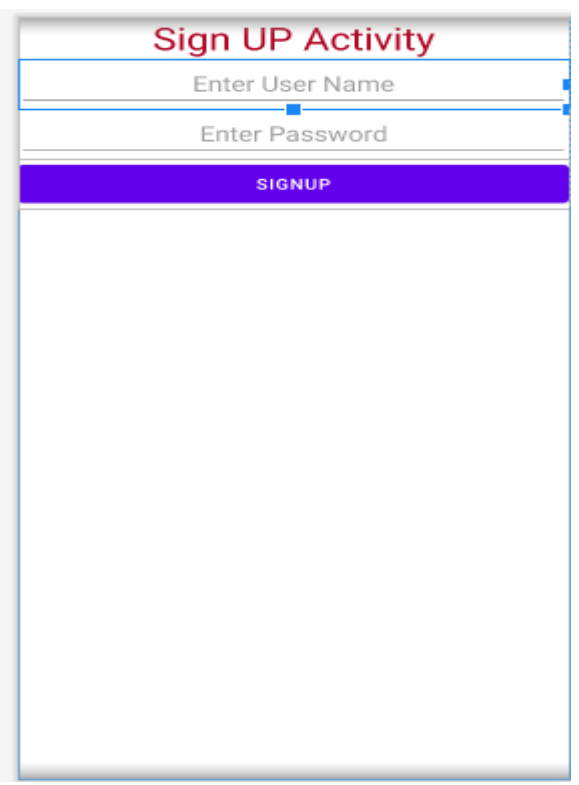


XML Part: Activity_main.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Sign UP Activity"
        android:textSize="30sp"
        android:textAlignment="center"
        android:textColor="@color/design_default_color_error"
        />
```

```
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/uid"
        android:hint="Enter  User Name"
        android:textSize="20sp"
        android:textAlignment="center"
        />

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/pwd"
        android:hint="Enter  Password"
        android:textSize="20sp"
        android:inputType="textPassword"
        android:textAlignment="center"
        />
    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/signup"
        android:text="SIGNUP"
        android:onClick="signup"
        />
</LinearLayout>
```

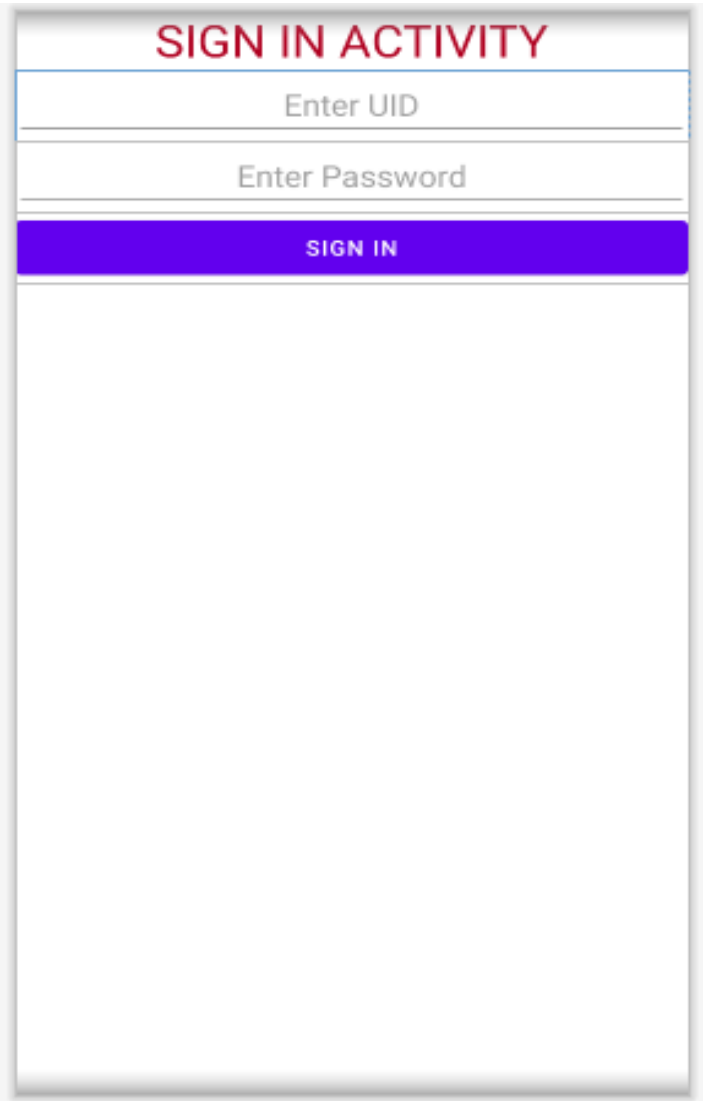
Design Output:



Activity_signin.xml

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


    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="SIGN IN ACTIVITY"
        android:textAlignment="center"
        android:textSize="30sp"
        android:textColor="@color/design_default_color_error"
        />

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/uid"
        android:hint="Enter UID"
        android:textAlignment="center"
        android:textSize="20sp"
        />

<EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/pwd"
        android:hint="Enter Password"
        android:textAlignment="center"
        android:inputType="textPassword"
        android:textSize="20sp"
        />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/signin"
        android:text="SIGN IN"
        android:textAlignment="center"
        android:onClick="signin"
        />
</LinearLayout>
```

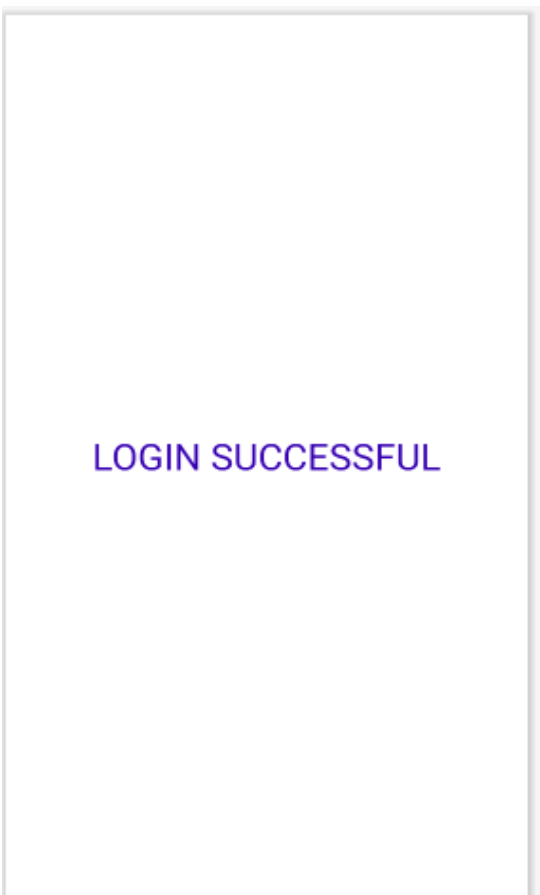
Design Output:



Activity_success.xml

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


    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="LOGIN SUCCESSFUL"
        android:textSize="30sp"
        android:textAlignment="center"
        android:layout_gravity="center"
        android:textColor="@color/design_default_color_primary_dark"
        />
</LinearLayout>
```

Design Output:



Java Coding Part: MainActivity.java

```
package com.example.labpgm3;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

import java.util.regex.Matcher;
import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity {
   EditText username, passwd;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      username = findViewById(R.id.uid);
      passwd = findViewById(R.id.pwd);
   }

   public void signup(View v)
   {
      if(passwd.getText().toString().length()>=8 &&
validatepassword(passwd.getText().toString()))
      {
         Toast.makeText(this, "SIGN UP Successful", Toast.LENGTH_LONG).show();
         Intent i = new Intent(this,Signin.class);
         Bundle b=new Bundle();
         b.putString("uid",username.getText().toString());
         b.putString("password",passwd.getText().toString());
         i.putExtras(b);
         startActivity(i);
      }
      else
      {
         Toast.makeText(this, "Password is not meeting the constraints",
Toast.LENGTH_LONG).show();
      }
   }


   public boolean validatepassword(String password)
   {
```

```
        Pattern ptrn;
        Matcher mat;
        String passwordptrn="^(?=.*[A-Z])(?=.*[a-z])(?=.*[0-
9])(?=.*[<>/@%$#+=])(?=\\S+$).{8,}$";
        ptrn=Pattern.compile(passwordptrn);
        mat=ptrn.matcher(password);
        return mat.matches();
    }


}
```

Java Coding Part: Signin.java

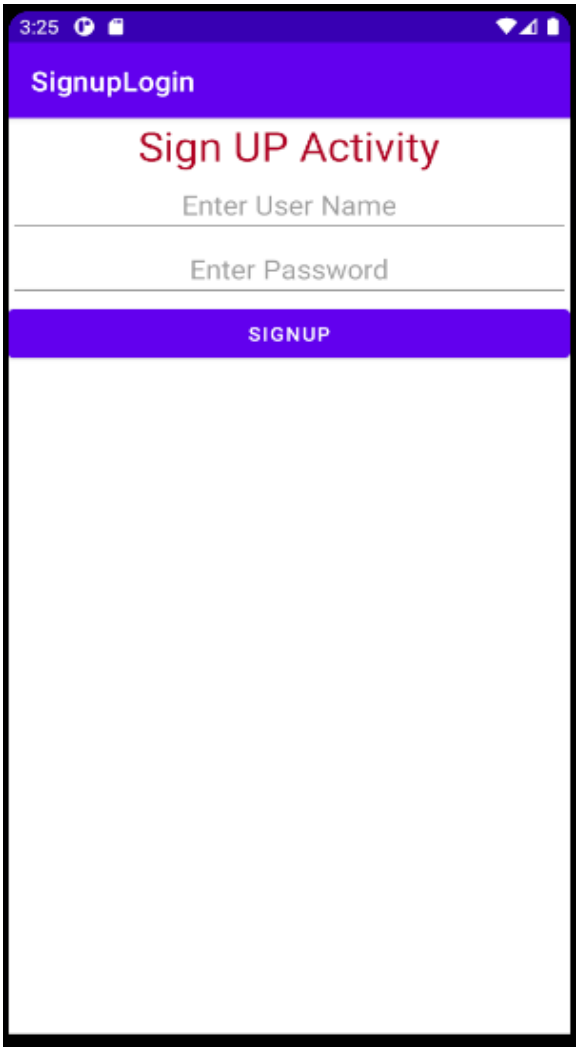
```
package com.example.labpgm3;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class Signin extends AppCompatActivity {
EditText username,password;
Button signin;
int attempts=0;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_signin);
        username=findViewById(R.id.uid);
        password=findViewById(R.id.pwd);
        signin=findViewById(R.id.signin);
    }


    public void signin(View v)
    {
        Bundle b=getIntent().getExtras();
        String uname=b.getString("uid");
        String passwd=b.getString("password");
        if(username.getText().toString().equals(uname) &&
password.getText().toString().equals(passwd))
        {
            Toast.makeText(this, "SIGN IN SUCCESSFUL", Toast.LENGTH_LONG).show();
```

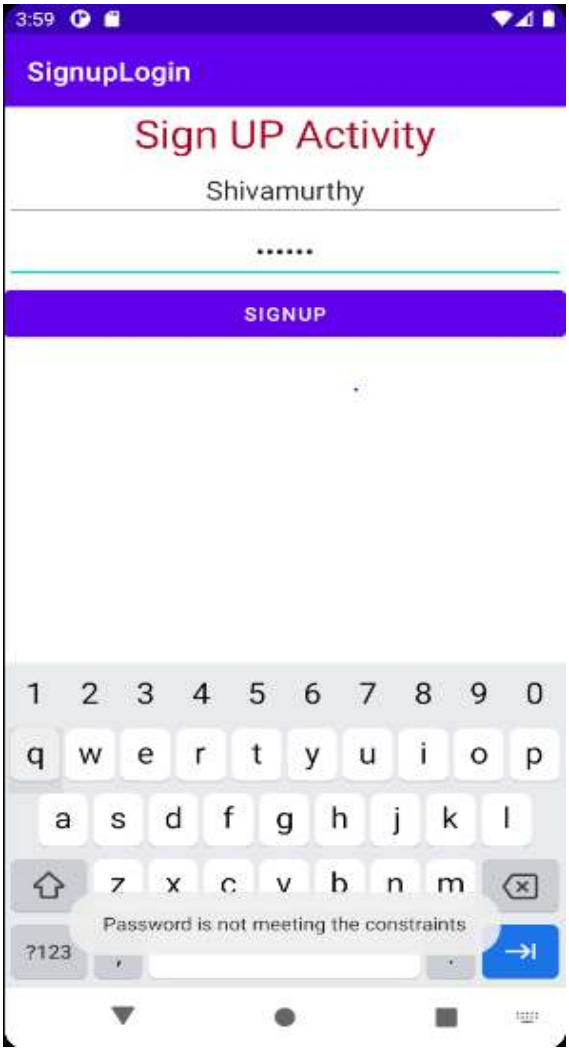
```
            attempts=0;
            Intent i =new Intent(this,Success.class);
            startActivity(i);
        }

        else
        {
            attempts++;
            Toast.makeText(this, "SIGN IN UNSUCCESSFUL. Number of
Attempts="+attempts, Toast.LENGTH_LONG).show();

            if(attempts==3)
                signin.setEnabled(false);
        }
    }
}
```

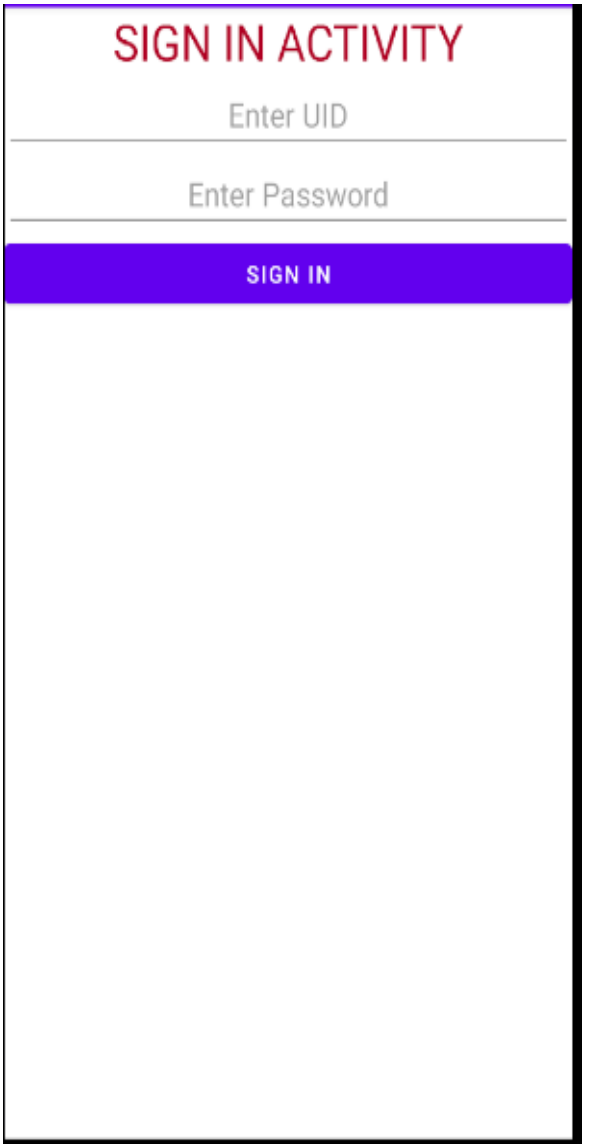
Java Coding Part: Success.java

```
package com.example.labpgm3;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

public class Success extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_success);
    }
}
```

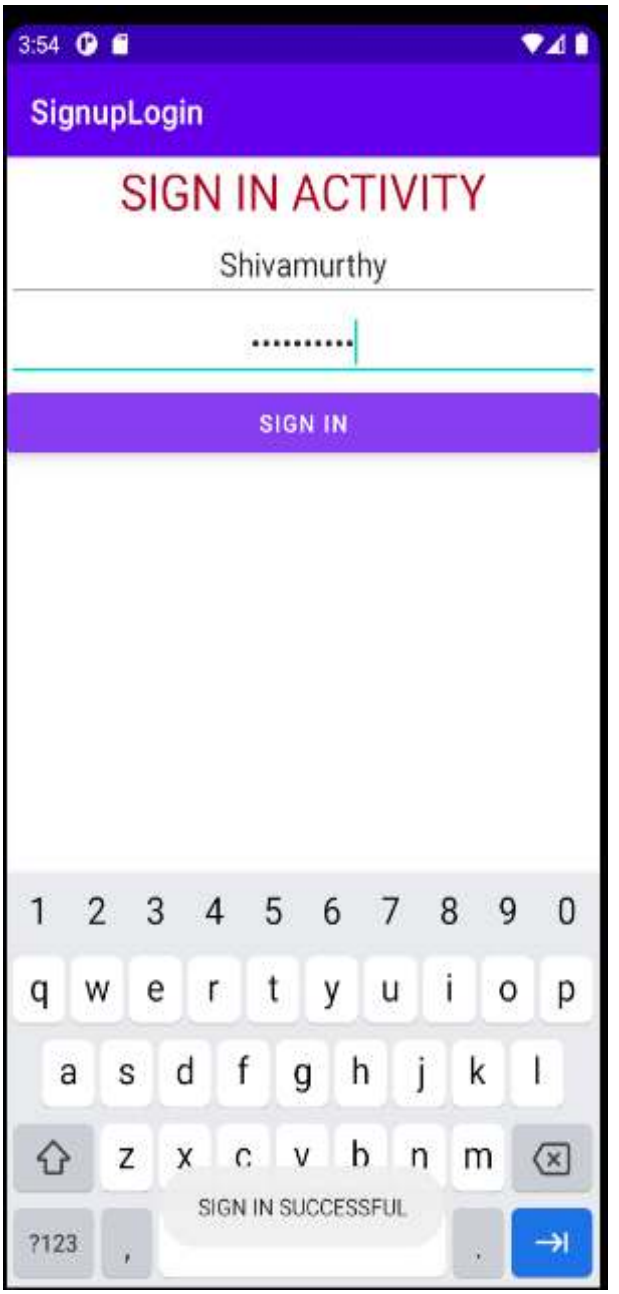
Output:


3:25
SignupLogin
Sign UP Activity
Enter User Name
Enter Password
SIGNUP


3:59
SignupLogin
Sign UP Activity
Shivamurthy
SIGNUP
Password is not meeting the constraints


SIGN IN ACTIVITY
Enter UID
Enter Password
SIGN IN

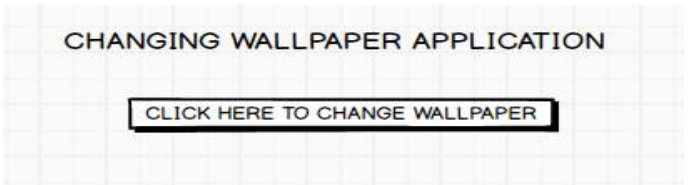

3:35
SignupLogin
SIGN IN ACTIVITY
Shivamurthy H S
.....
SIGN IN
SIGN IN UNSUCCESSFUL. Number of Attempts=2


3:54
SignupLogin
SIGN IN ACTIVITY
Shivamurthy
SIGN IN
SIGN IN SUCCESSFUL


SignupLogin
SIGN IN ACTIVITY
Shivamurthy H S
SIGN IN

Program 4:

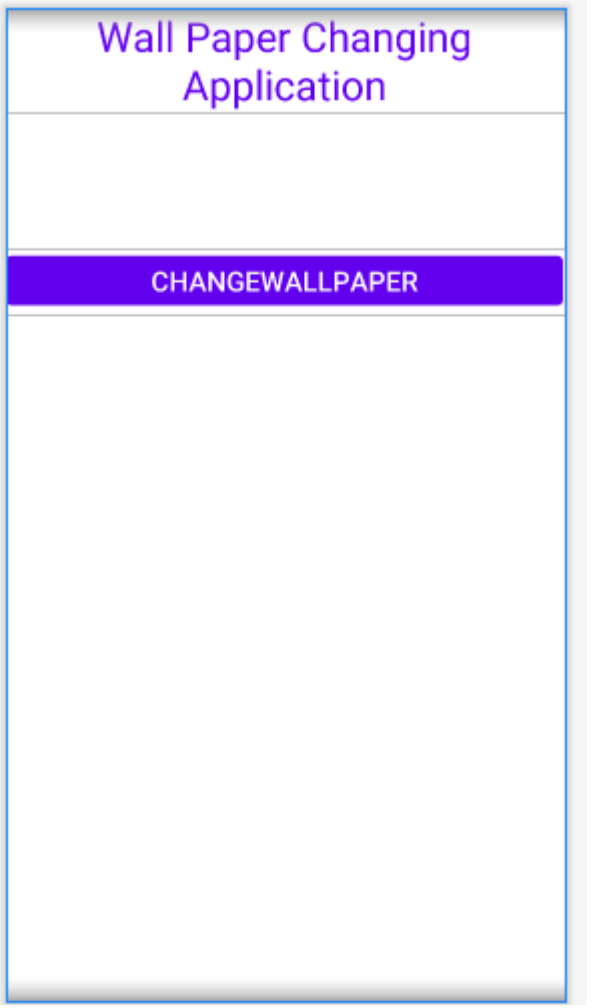
Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 seconds.



XML Part: activity_main.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Wall Paper Changing Application"
        android:textAlignment="center"
        android:textSize="30sp"
        android:textColor="@color/design_default_color_primary"
        />
    <Button
        android:layout_marginTop="100dp"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/wp"
        android:text="changewallpaper"
        android:textSize="20sp"
        android:onClick="ChangeWallpaper"
        />

</LinearLayout>
```

Design Output:



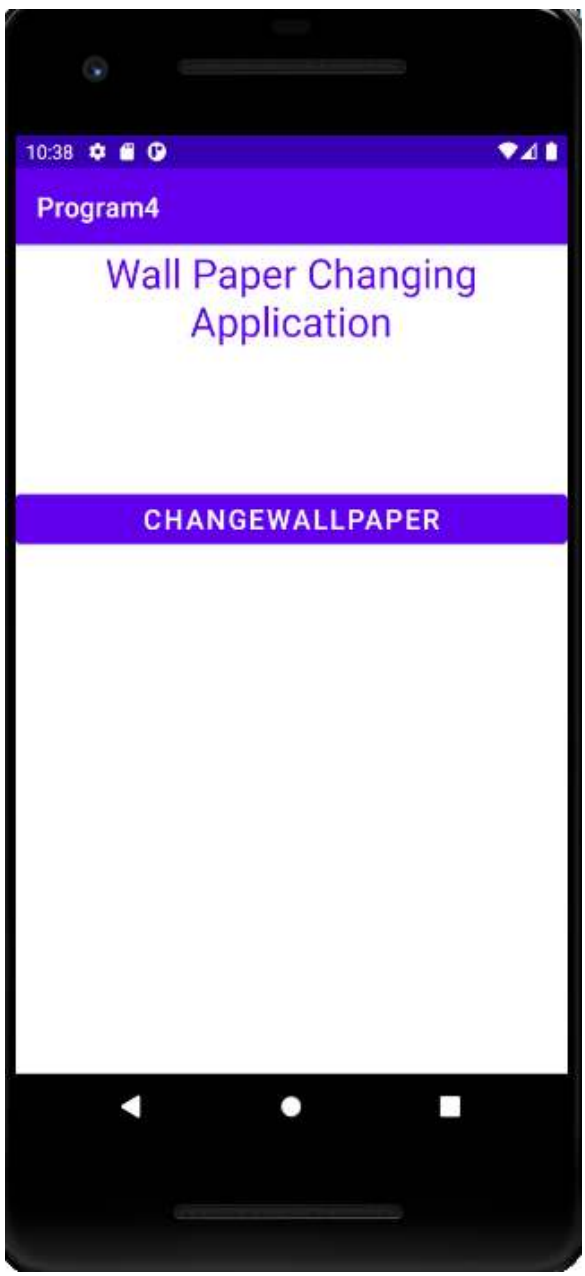
Java Coding Part: MainActivity.java

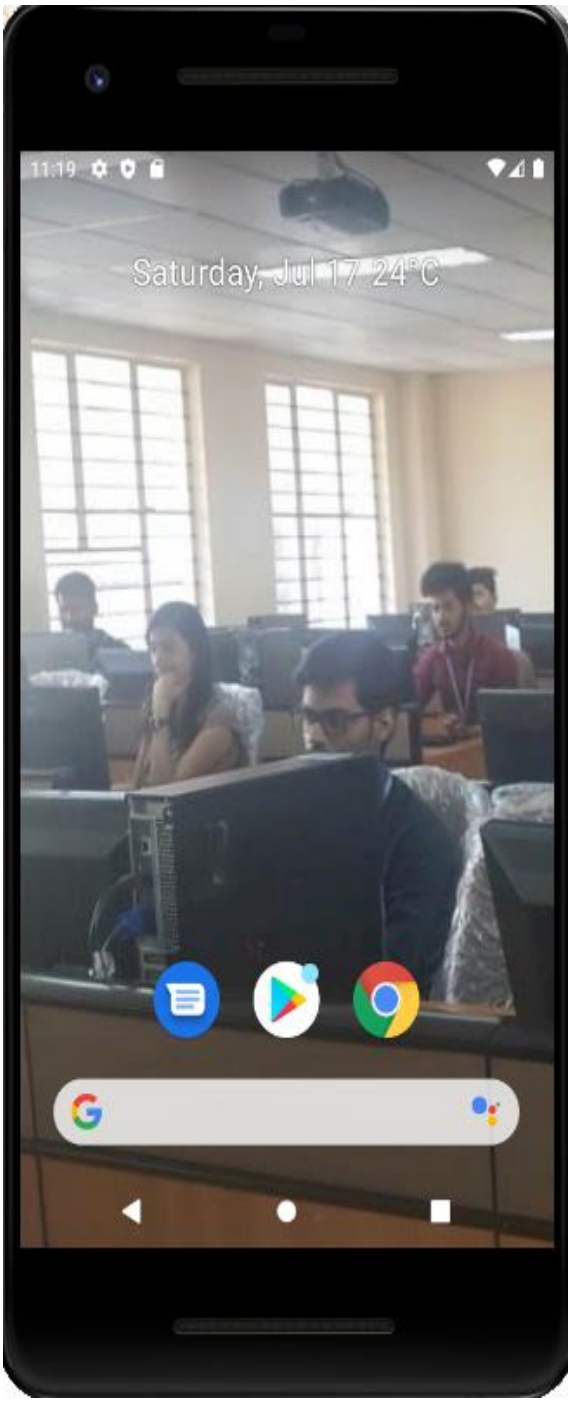
```
package com.example.labpgm4;

import androidx.appcompat.app.AppCompatActivity;

import android.app.WallpaperManager;
import android.graphics.Bitmap;
import android.graphics.drawable.BitmapDrawable;
import android.graphics.drawable.Drawable;
import android.os.Bundle;
import android.view.View;

import java.io.IOException;
import java.util.Timer;
import java.util.TimerTask;

public class MainActivity extends AppCompatActivity {
Timer mytimer;
Drawable drawable;
WallpaperManager wpm;
int next=1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        mytimer=new Timer();
        wpm=WallpaperManager.getInstance(this);
    }

    public void changewallpaper(View v)
    {
        setWallPaper();
    }

    public void setWallPaper()
    {
      mytimer.schedule(new TimerTask() {
          @Override
          public void run() {
            if(next==1)
            {
                drawable=getResources().getDrawable(R.drawable.one);
                      next=2;
            }
            else if(next==2)
            {
                drawable=getResources().getDrawable(R.drawable.two);
                next=3;
            }
```

```
else if(next==3)
{
   drawable=getResources().getDrawable(R.drawable.three);
   next=4;
}

else if(next==4)
{
   drawable=getResources().getDrawable(R.drawable.four);
   next=5;
}

else if(next==5)
{
   drawable=getResources().getDrawable(R.drawable.five);
   next=6;
}

else if(next==6)
{
   drawable=getResources().getDrawable(R.drawable.six);
   next=7;
}

else if(next==7)
{
   drawable=getResources().getDrawable(R.drawable.seven);
   next=8;
}

else if(next==8)
{
   drawable=getResources().getDrawable(R.drawable.eight);
   next=9;
}

else if(next==9)
{
   drawable=getResources().getDrawable(R.drawable.nine);
   next=10;
}

else if(next==10)
{
   drawable=getResources().getDrawable(R.drawable.ten);
   next=1;
}

Bitmap  img=((BitmapDrawable)drawable).getBitmap();
```

```
            try {
                wpm.setBitmap(img);
            } catch (IOException  e) {
                e.printStackTrace();
            }

        }
    },30000,5000);
  }
}
```

Output:




11:19
Saturday, Jul 17 24°C


11:24
Saturday, Jul 17 24°C

Program No. 5:

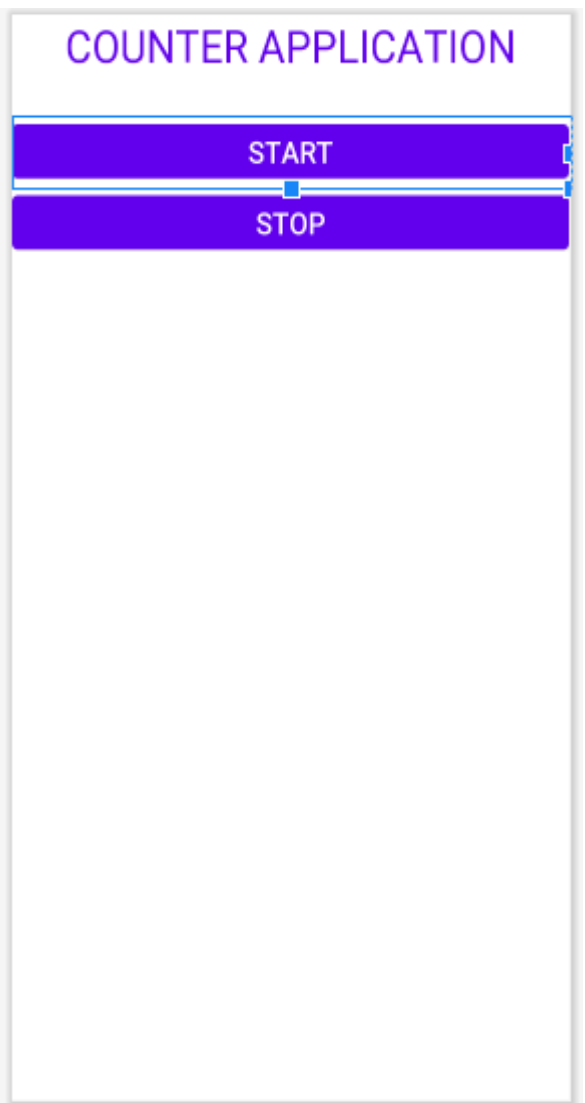
Write a program to create an activity with two buttons START and STOP. On pressing of the START button, the activity must start the counter by displaying the numbers from One and the counter must keep on counting until the STOP button is pressed. Display the counter value in a TextView control.

XML Part– activity_main.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="COUNTER APPLICATION"
        android:textSize="30sp"
        android:textColor="@color/design_default_color_primary"
        android:textAlignment="center"
        />

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/count"
        android:textAlignment="center"
        android:textSize="20sp"
        android:textColor="@color/design_default_color_primary"
        />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/start"
        android:text="START"
```

```
        android:onClick="start"
        android:textSize="20sp"
        />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/stop"
        android:text="STOP"
        android:onClick="stop"
        android:textSize="20sp"
        />

</LinearLayout>
```

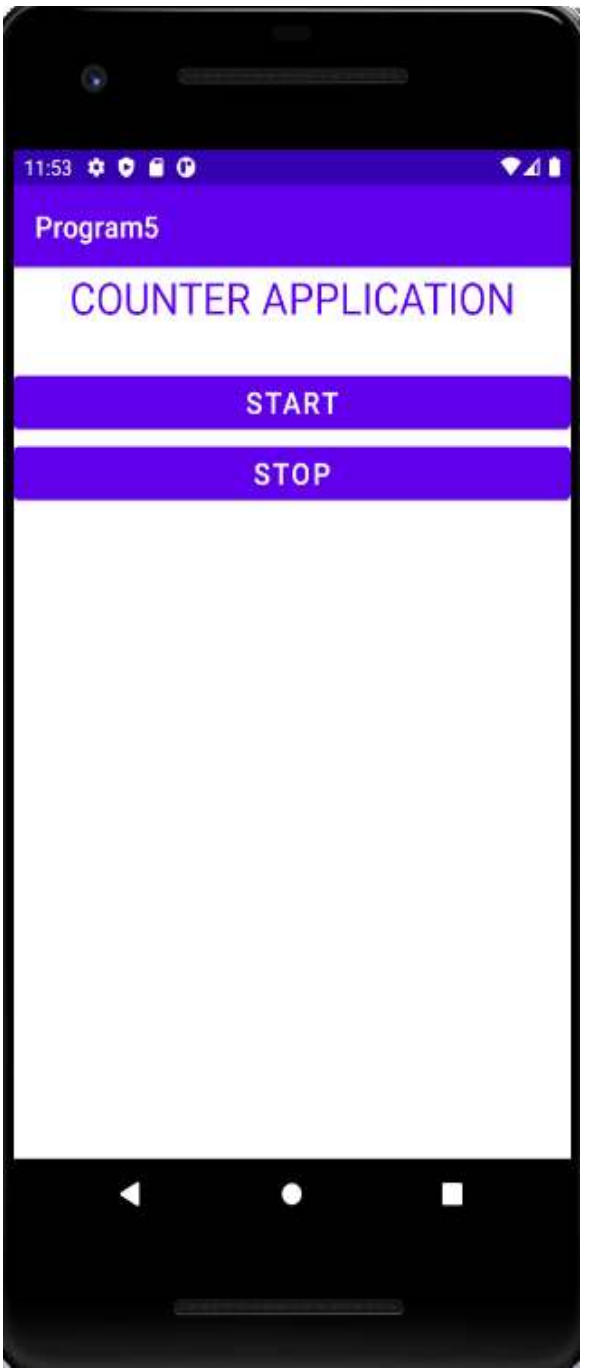
Design Output:

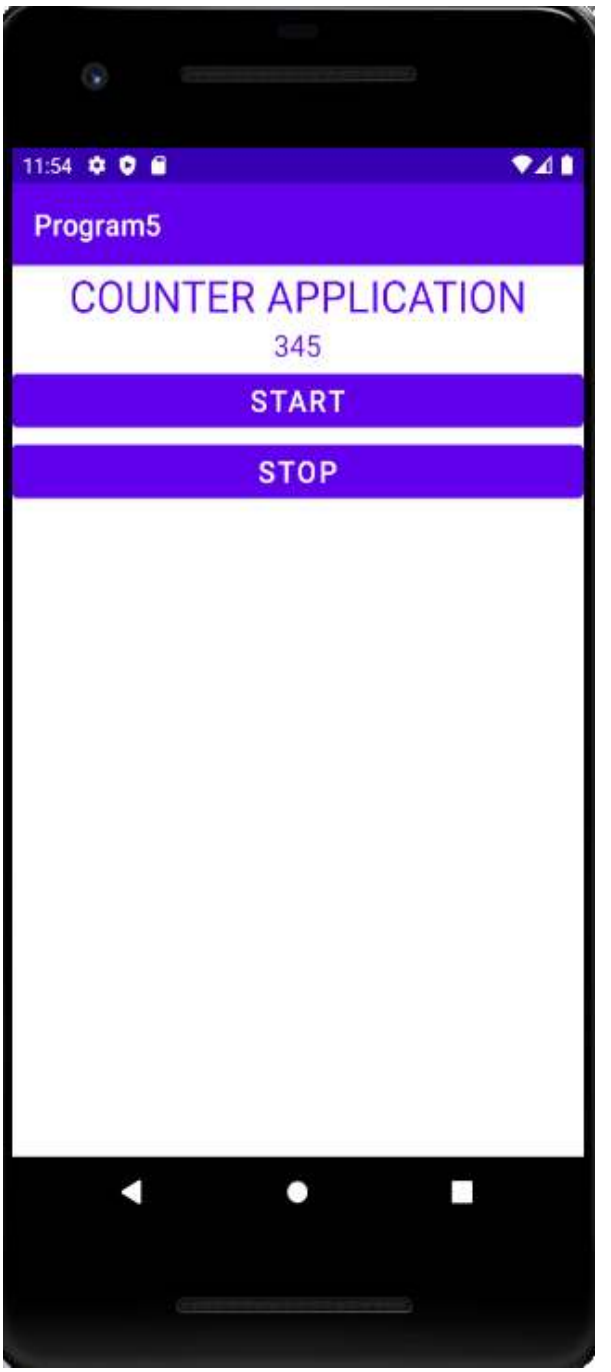


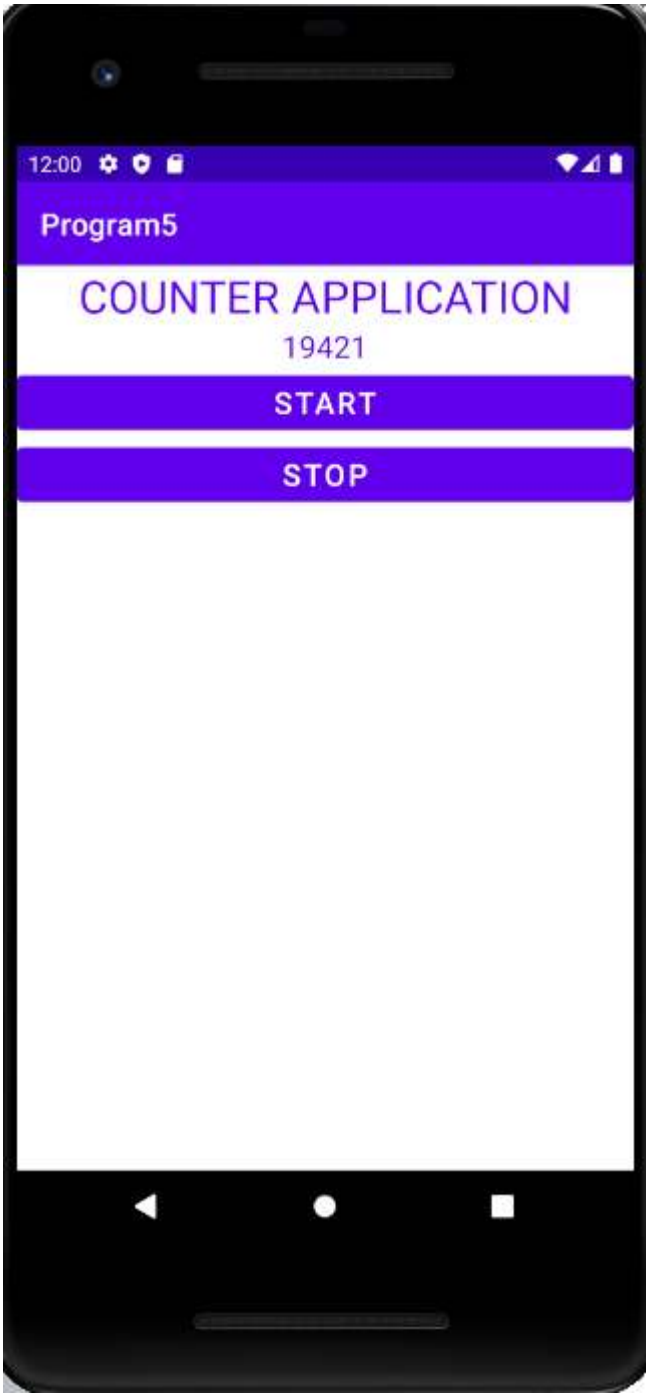
Java Code – MainActivity.java

```
package com.example.program5;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
int i=1;
Button start,stop;
TextView counter;
Handler myhandler=new Handler();

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        start=findViewById(R.id.start);
        stop=findViewById(R.id.stop);
        counter=findViewById(R.id.count);
    }

    public void start(View v)
    {
        i=1;
       myhandler.postDelayed(Threadcount,0);

    }

    public void stop(View v)
    {
        myhandler.removeCallbacks(Threadcount);
    }

    public Runnable Threadcount=new Runnable()
    {

        @Override
        public void run() {
            counter.setText(""+i);
            i++;
            myhandler.postDelayed(Threadcount,0);
        }
    };
}
```

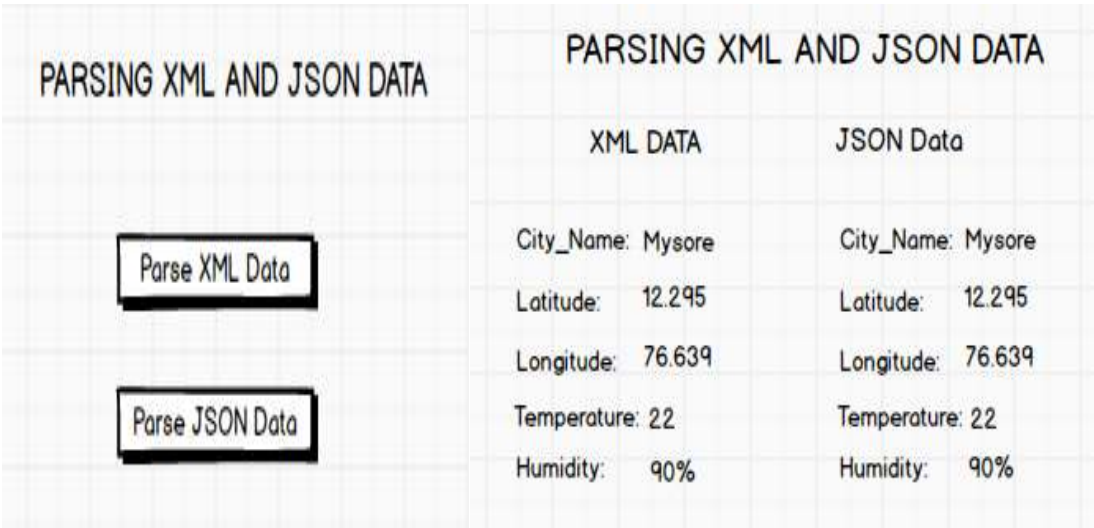
Output:


11:53
Program5
COUNTER APPLICATION
START
STOP


11:54
Program5
COUNTER APPLICATION
345
START
STOP


12:00
Program5
COUNTER APPLICATION
19421
START
STOP

6 Create two files of XML and JSON type with values for City_Name, Latitude, Longitude, Temperature, and Humidity. Develop an application to create an activity with two buttons to parse the XML and JSON files which when clicked should display the data in their respective layouts side by side.

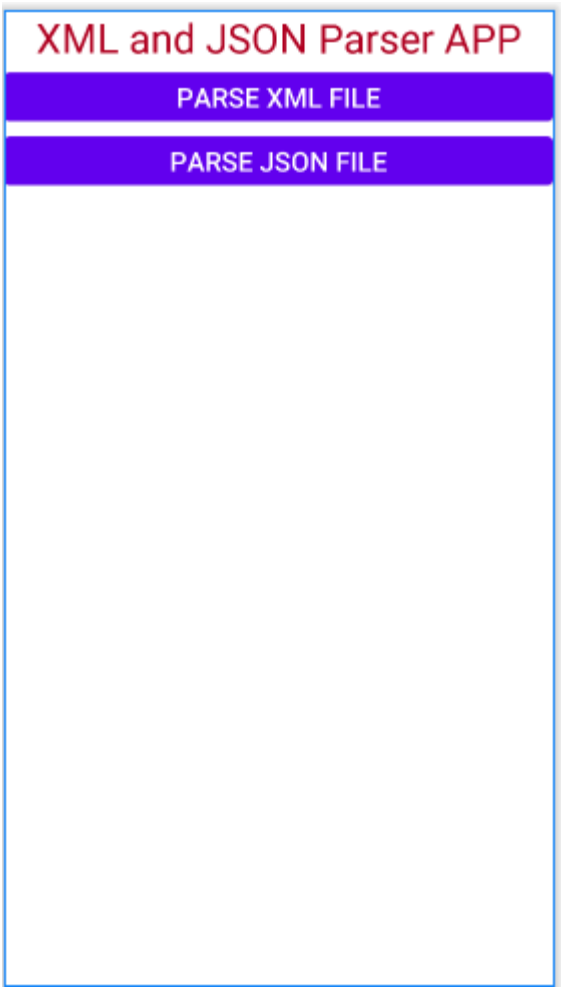


XML Part– activity_main.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="XML and JSON Parser"
        android:textSize="30sp"
        android:textAlignment="center"
        />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:onClick="XMLParser"
        android:text="XML PARSER"
        android:textAlignment="center"
        />

    <Button
        android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content"
        android:onClick="JSONParser"
        android:text="JSON  PARSER"
        android:textAlignment="center"
        />

    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        android:layout_gravity="center">

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/resxml"
            android:textSize="15sp"
            android:textAlignment="center"
            android:paddingLeft="10dp"
            android:paddingRight="40dp"
            />

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/resjson"
            android:textSize="15sp"
            android:textAlignment="center"
            android:paddingLeft="40dp"
            />

    </LinearLayout>

</LinearLayout>
```

Design Output:



Java Code – MainActivity.java

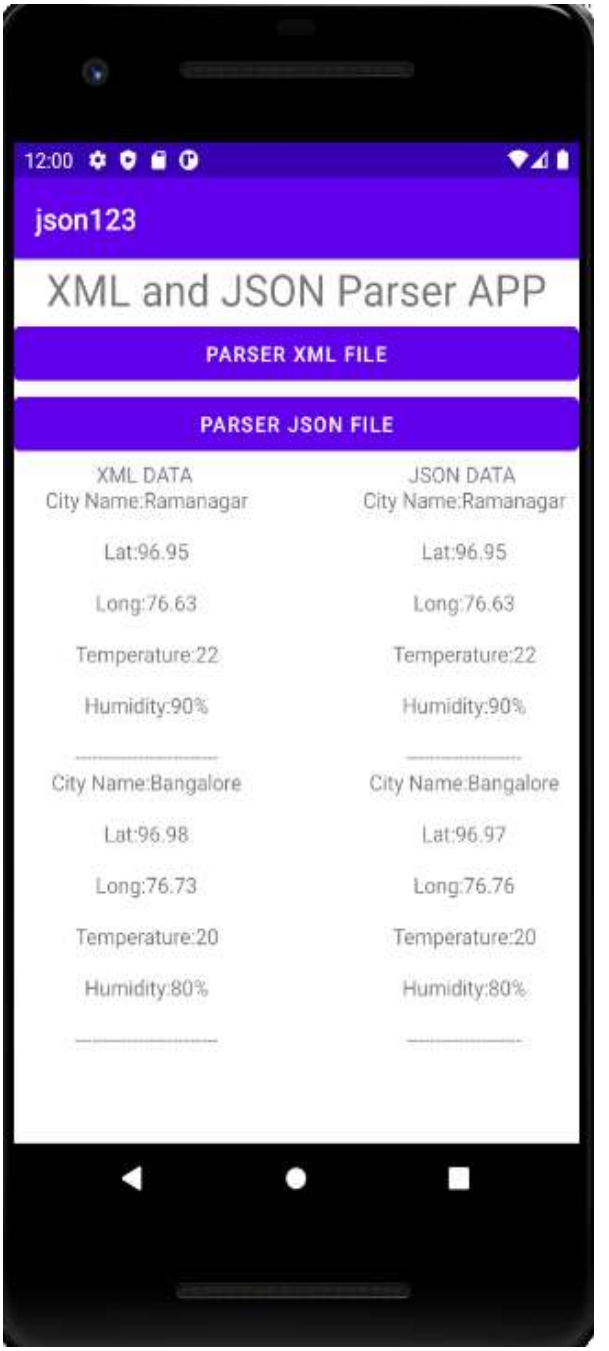
```
package com.example.json123;
import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.TextView;

import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;
import org.w3c.dom.Document;
import org.w3c.dom.Element;
import org.w3c.dom.Node;
import org.w3c.dom.NodeList;
import org.xml.sax.SAXException;

import java.io.IOException;
import java.io.InputStream;

import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;
import javax.xml.parsers.ParserConfigurationException;

public class MainActivity extends AppCompatActivity {
   TextView resxml,resjson;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      resxml=findViewById(R.id.resxml);
      resjson=findViewById(R.id.resjson);
   }

   public void XMLParser(View v)
   {
      try {
         InputStream is=getAssets().open("city.xml");
         DocumentBuilderFactory dbFactory=DocumentBuilderFactory.newInstance();
         DocumentBuilder dBuilder=dbFactory.newDocumentBuilder();
         Document doc=dBuilder.parse(is);
         Element element=doc.getDocumentElement();
         element.normalize();
         NodeList nList= doc.getElementsByTagName("place");
         resxml.setText("XML DATA");

         for(int i=0;i<nList.getLength();i++)
         {
            Node node=nList.item(i);
```

```
            if(node.getNodeType()==Node.ELEMENT_NODE)
            {
                Element element2=(Element)node;
                resxml.setText(resxml.getText()+"\n City
Name:"+getValue("cityname",element2)+"\n");
                resxml.setText(resxml.getText()+"\n Lat:"+getValue("lat",element2)+"\n");
                resxml.setText(resxml.getText()+"\n Long:"+getValue("long",element2)+"\n");
                resxml.setText(resxml.getText()+"\n
Temperature:"+getValue("temp",element2)+"\n");
                resxml.setText(resxml.getText()+"\n
Humidity:"+getValue("humidity",element2)+"\n");
                resxml.setText(resxml.getText()+"\n ------------------------");
            }
        }


    }


    catch (IOException | ParserConfigurationException | SAXException e) {
        e.printStackTrace();
    }
}

private static String getValue(String tag, Element element)
{
    NodeList nodeList=element.getElementsByTagName(tag).item(0).getChildNodes();
    Node node=nodeList.item(0);
    return node.getNodeValue();
}

public void JSONParser(View v)
{
    String json;
    try {
        InputStream is=getAssets().open("city1.json");
        int size=is.available();
        byte[] buffer=new byte[size];
        is.read(buffer);
        is.close();
        json=new String(buffer, "UTF-8");
        JSONArray jsonArray=new JSONArray(json);
        resjson.setText("JSON DATA");

        for(int i=0; i<jsonArray.length();i++)
        {
            JSONObject obj=jsonArray.getJSONObject(i);
            resjson.setText(resjson.getText()+"\n City Name:"+obj.getString("name")+"\n");
            resjson.setText(resjson.getText()+"\n Lat:"+obj.getString("lat")+"\n");
            resjson.setText(resjson.getText()+"\n Long:"+obj.getString("long")+"\n");
```

```
            resjson.setText(resjson.getText()+"\n  Temperature:"+obj.getString("temp")+"\n");
            resjson.setText(resjson.getText()+"\n  Humidity:"+obj.getString("humidity")+"\n");
            resjson.setText(resjson.getText()+"\n  ----------");
        }
    }


    catch (IOException | JSONException e) {
        e.printStackTrace();
    }
  }

}
```

Output:


11:59
json123
XML and JSON Parser APP
PARSER XML FILE
PARSER JSON FILE
XML DATA
City Name:Ramanagar
Lat:96.95
Long:76.63
Temperature:22
Humidity:90%
City Name:Bangalore
Lat:96.98
Long:76.73
Temperature:20
Humidity:80%


12:00
json123
XML and JSON Parser APP
PARSER XML FILE
PARSER JSON FILE
XML DATA
City Name:Ramanagar
Lat:96.95
Long:76.63
Temperature:22
Humidity:90%
City Name:Bangalore
Lat:96.98
Long:76.73
Temperature:20
Humidity:80%
JSON DATA
City Name:Ramanagar
Lat:96.95
Long:76.63
Temperature:22
Humidity:90%
City Name:Bangalore
Lat:96.97
Long:76.76
Temperature:20
Humidity:80%

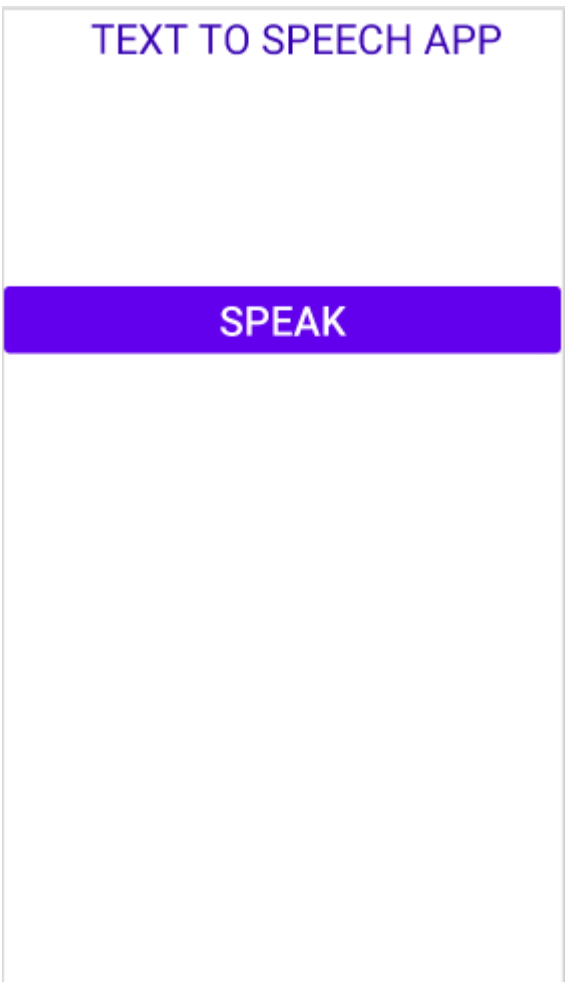
7 Develop a simple application with one Edit Text so that the user can write some text in it. Create a button called "Convert Text to Speech" that converts the user input text into voice.

XML Part– activity_main.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="TEXT TO SPEECH APP"
        android:textColor="@color/design_default_color_primary_dark"
        android:textAlignment="center"
        android:textSize="30sp"

        />

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/pitch"
        android:hint="Enter Pitch (1.0 is normal)"
        android:textSize="20sp"


        />

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/speechrate"
        android:hint="Enter Speech Rate (1.0 is normal)"
        android:textSize="20sp"
        />
```

```
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/texttospeak"
        android:hint="Enter  Text  to Speak"
        android:inputType="textMultiLine"


        />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/btnspeak"
        android:text="SPEAK"
        android:onClick="speak"
        android:textSize="30sp"
        />

</LinearLayout>
```

Design Output:

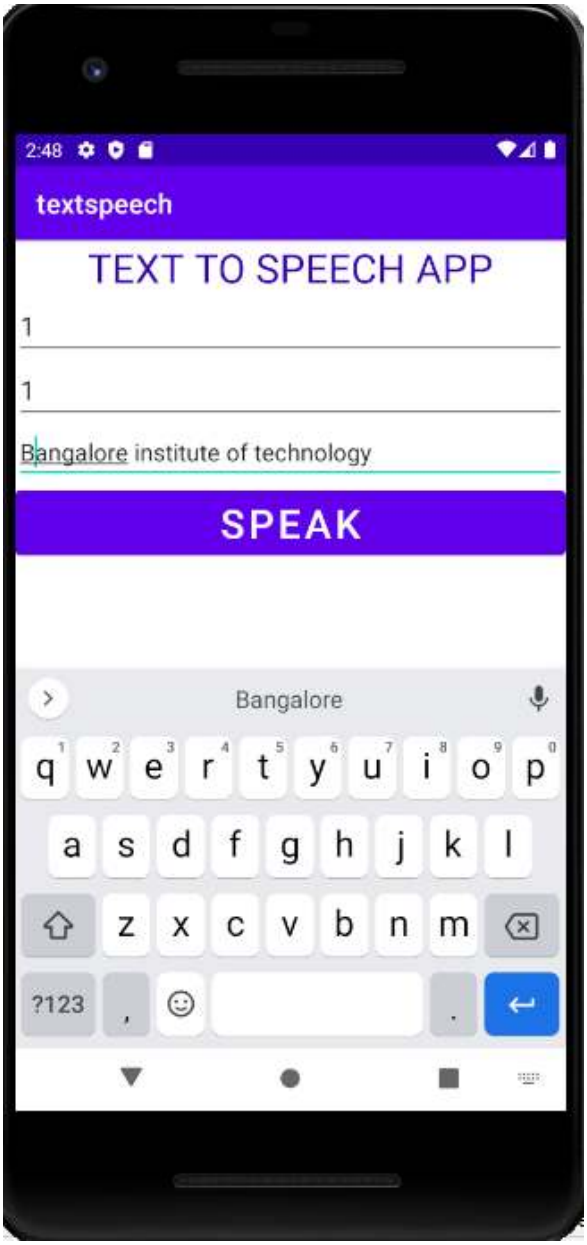


Java Code – MainActivity.java

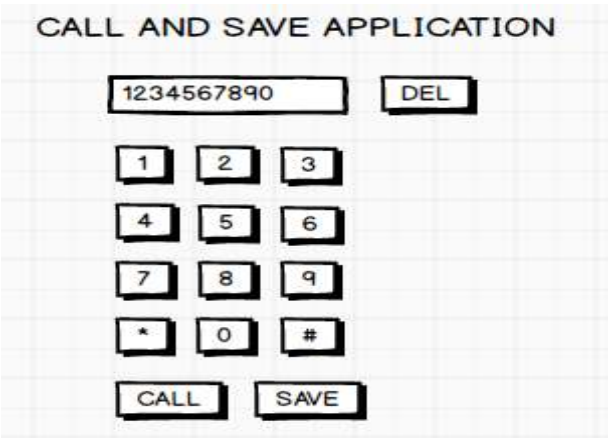
```
package com.example.textspeech;

import androidx.appcompat.app.AppCompatActivity;

import android.app.UiAutomation;
import android.os.Bundle;
import android.speech.tts.TextToSpeech;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

import java.util.Locale;

import static android.speech.tts.TextToSpeech.*;

public class MainActivity extends AppCompatActivity {
   EditText pitchrate,setspeechrate,text;
   TextToSpeech t;


   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      pitchrate=findViewById(R.id.pitch);
      setspeechrate=findViewById(R.id.speechrate);
      text=findViewById(R.id.texttospeak);

      t=new TextToSpeech(this, new OnInitListener() {
         @Override
         public void onInit(int status) {
            if(status==SUCCESS)
            {
               t.setLanguage(Locale.ENGLISH);
            }
            else
            {
               Toast.makeText(MainActivity.this, "TextToSpeech Initialization Failed",
Toast.LENGTH_LONG).show();
            }
         }
      });


   }

   public void speak(View v)
   {
```

```
        float pr,sr;
        String txt;
        if(pitchrate.getText().toString().equals(""))
        {
            pr=1.0f;
        }
        else
        {
            pr=Float.parseFloat(pitchrate.getText().toString());
        }

        if(setspeechrate.getText().toString().equals(""))
        {
            sr=1.0f;
        }
        else
        {
            sr=Float.parseFloat(setspeechrate.getText().toString());
        }

        t.setPitch(pr);
        t.setSpeechRate(sr);
        t.speak(text.getText().toString(),QUEUE_FLUSH,null);
    }
}
```

Output:


2:48
textspeech
TEXT TO SPEECH APP
1
1
Bangalore institute of technology
SPEAK
Bangalore
q w e r t y u i o p
a s d f g h j k l
z x c v b n m
?123

8 Create an activity like a phone dialer with CALL and SAVE buttons. On pressing the CALL button, it must call the phone number and on pressing the SAVE button it must save the number to the phone contacts.



XML Part– activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:layout_marginTop="150dp"
    tools:context=".MainActivity">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="CALL and SAVE APPLICATION"
        android:textSize="30sp"
        android:textAlignment="center"
        android:textColor="@color/design_default_color_primary_dark"
        />

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

        <EditText
            android:layout_width="300dp"
            android:layout_height="wrap_content"
            android:id="@+id/num"
            android:hint="Enter Number To Dial/SAVE"
            android:textAlignment="center"
```

```
        android:textSize="20sp"
        android:textColor="@color/design_default_color_error"/>

    <Button
        android:layout_width="100dp"
        android:layout_height="wrap_content"
        android:id="@+id/del"
        android:text="DEL"
        android:textAlignment="center"
        android:onClick="delete"/>


</LinearLayout>

<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:orientation="horizontal">

    <Button
        android:id="@+id/three"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:onClick="three"
        android:text="3" />

    <Button
        android:id="@+id/one"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"

        android:onClick="one"
        android:text="1" />

    <Button
        android:id="@+id/two"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:onClick="two"
        android:text="2" />


</LinearLayout>

<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:layout_gravity="center">
```

```
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/four"
        android:text="4"
        android:onClick="four"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/five"
        android:text="5"
        android:onClick="five"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/six"
        android:text="6"
        android:onClick="six"/>
</LinearLayout>

<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:layout_gravity="center">

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/seven"
        android:text="7"
        android:onClick="seven"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/eight"
        android:text="8"
        android:onClick="eight"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/nine"
        android:text="9"
        android:onClick="nine"/>

</LinearLayout>

<LinearLayout
    android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        android:layout_gravity="center">

        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/star"
            android:text="*"
            android:onClick="star"/>
        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/zero"
            android:text="0"
            android:onClick="zero"/>
        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/hash"
            android:text="#"
            android:onClick="hash"/>

    </LinearLayout>

    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        android:layout_gravity="center">

        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/call"
            android:text="CALL"
            android:onClick="call"/>
        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/save"
            android:text="SAVE"
            android:onClick="save"/>
    </LinearLayout>

</LinearLayout>
```

Design Output:

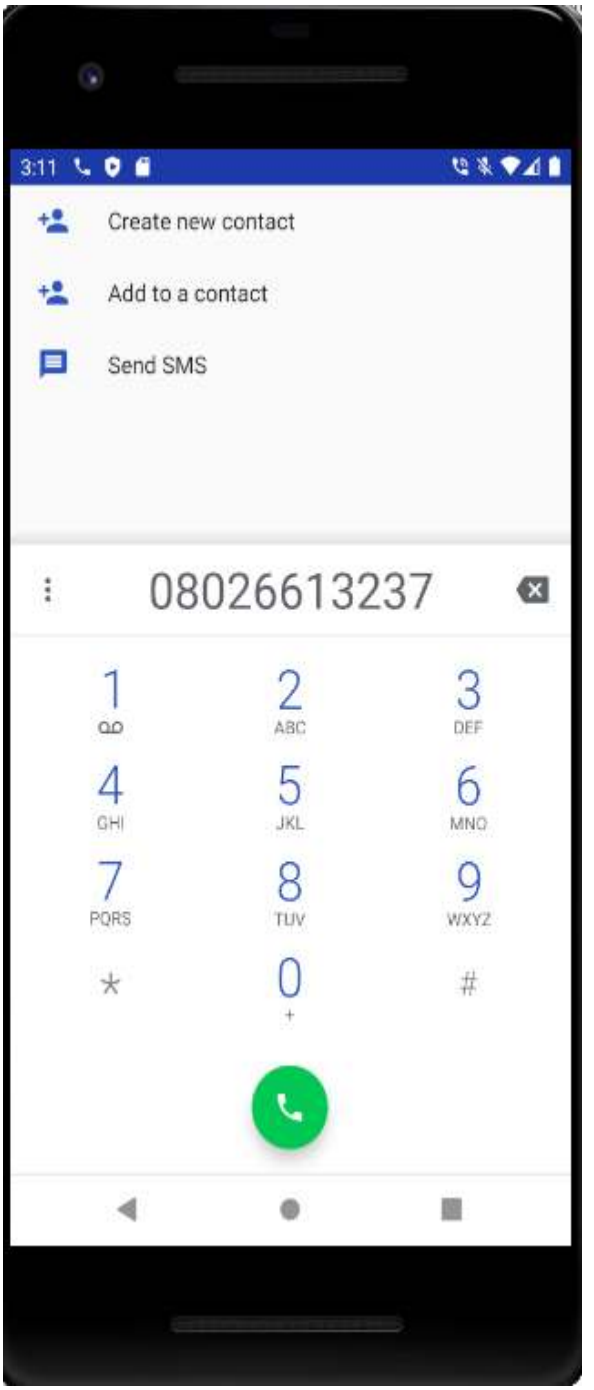
Java Code – MainActivity.java

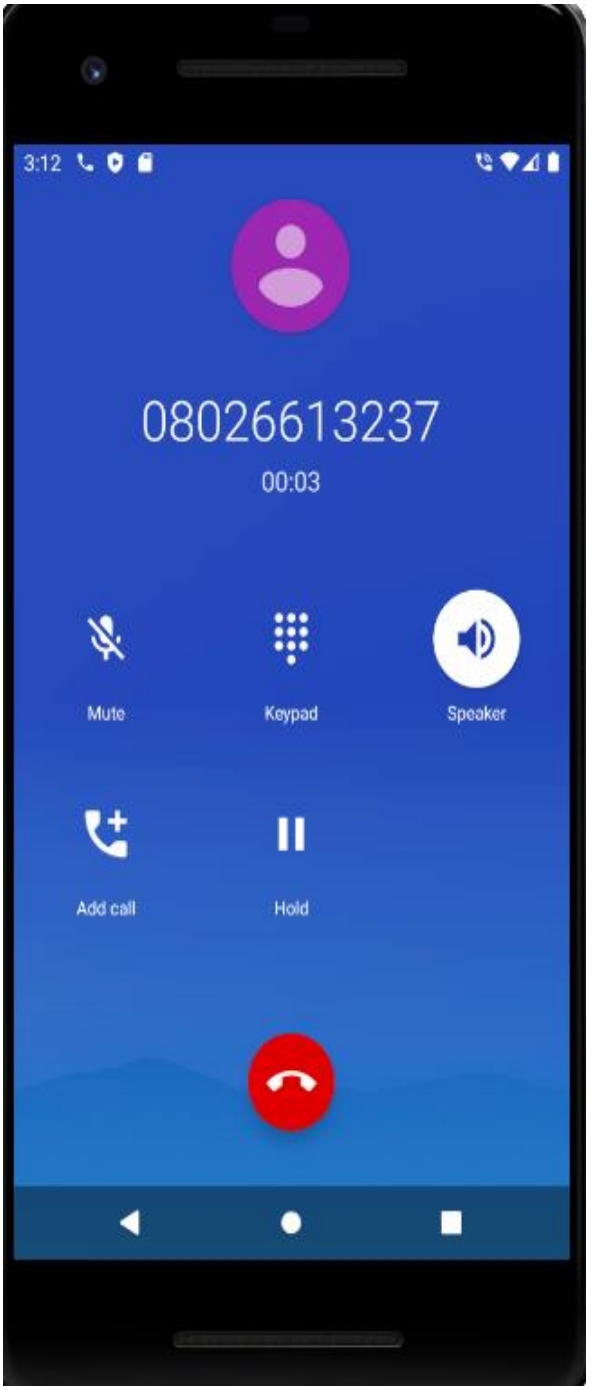
```
package com.example.l8;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.os.VibrationEffect;
import android.provider.ContactsContract;
import android.view.View;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity {
EditText number;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        number=findViewById(R.id.num);
    }

    public void one(View v)
    {
        number.append("1");
    }

    public void two(View v)
    {
        number.append("2");

    }

    public void three(View v)
    {
        number.append("3");
    }

    public void four(View v)
    {
        number.append("4");
    }

    public void five(View v)
    {
        number.append("5");
    }

    public void six(View v)
```

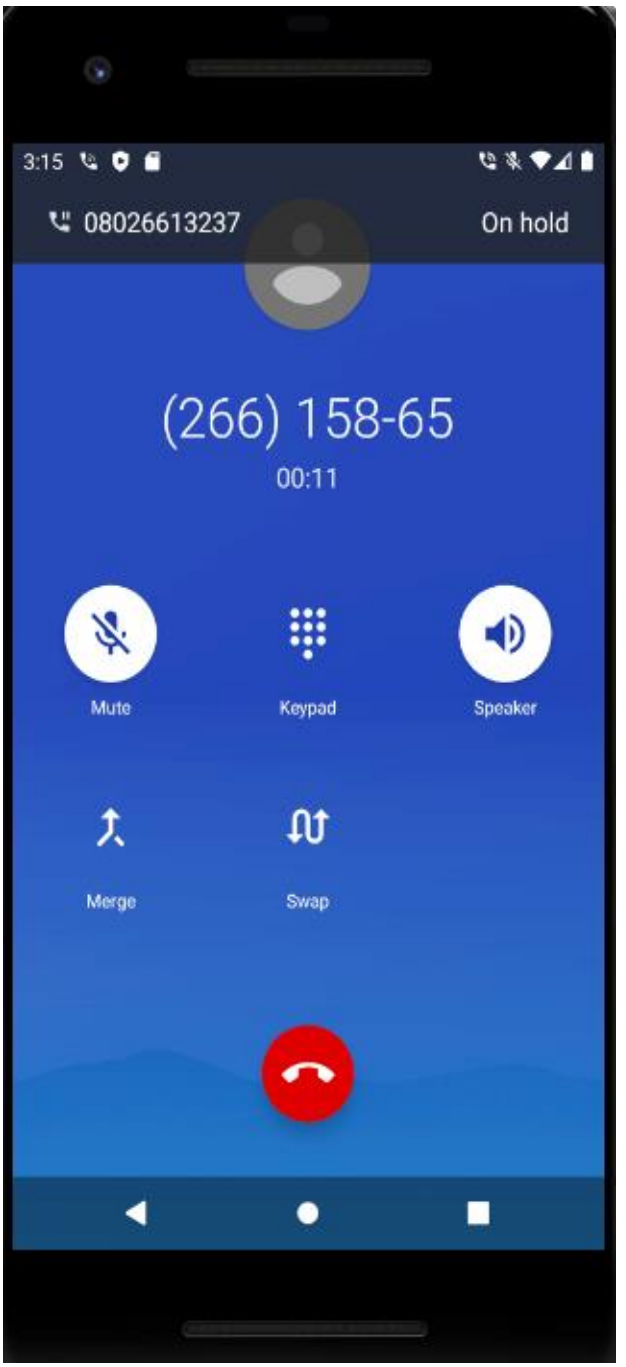
```
{
   number.append("6");
}

public void seven(View v)
{
   number.append("7");
}

public void eight(View v)
{
   number.append("8");
}

public void nine(View v)
{
   number.append("9");
}

public void zero(View v)
{
   number.append("0");
}

public void star(View v)
{
   number.append("*");
}

public void hash(View v)
{
   number.append("#");
}

public void delete(View v)
{
   String n=number.getText().toString();
   n=n.substring(0,n.length()-1);
   number.setText(n);
}

public void call(View v)
{
   String num=number.getText().toString();
  Intent i =new Intent(Intent.ACTION_DIAL, Uri.parse("tel:"+num));

   //Intent i =new Intent(Intent.ACTION_VIEW,Uri.parse(num));
   startActivity(i);
}
```

```
    public void save(View v)
    {
        String num=number.getText().toString();
        Intent i =new Intent(Intent.ACTION_INSERT,
ContactsContract.Contacts.CONTENT_URI);
        i.putExtra(ContactsContract.Intents.Insert.PHONE,num);
        startActivity(i);
    }
}
```

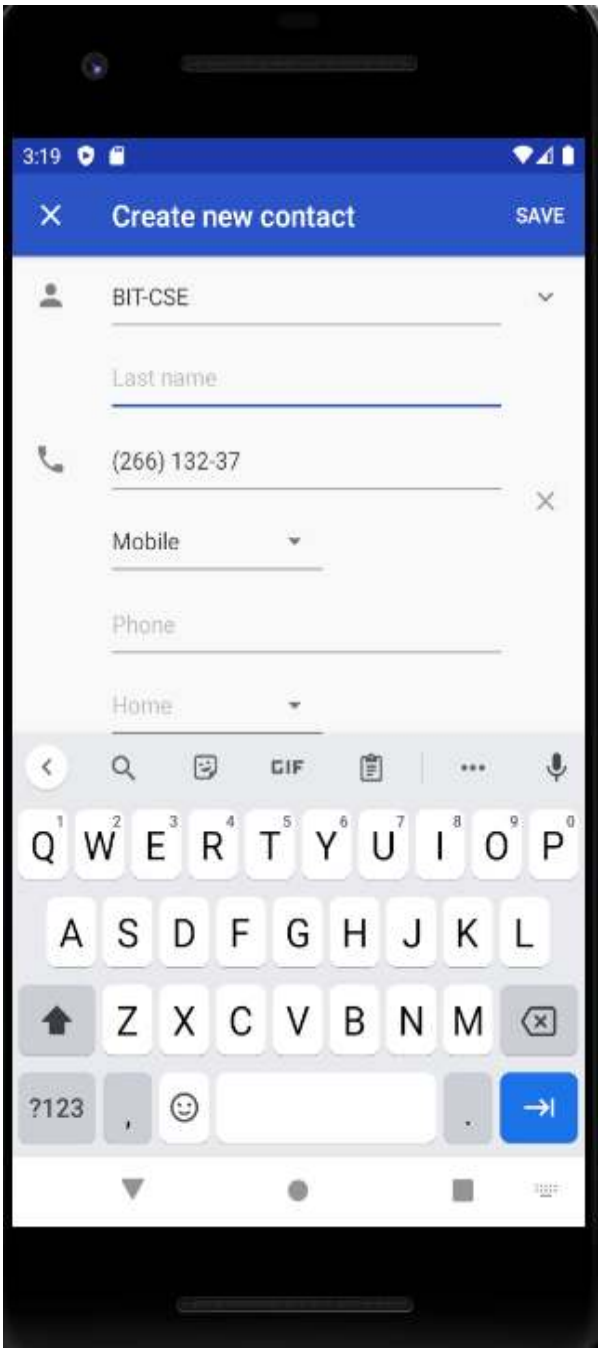
Output:

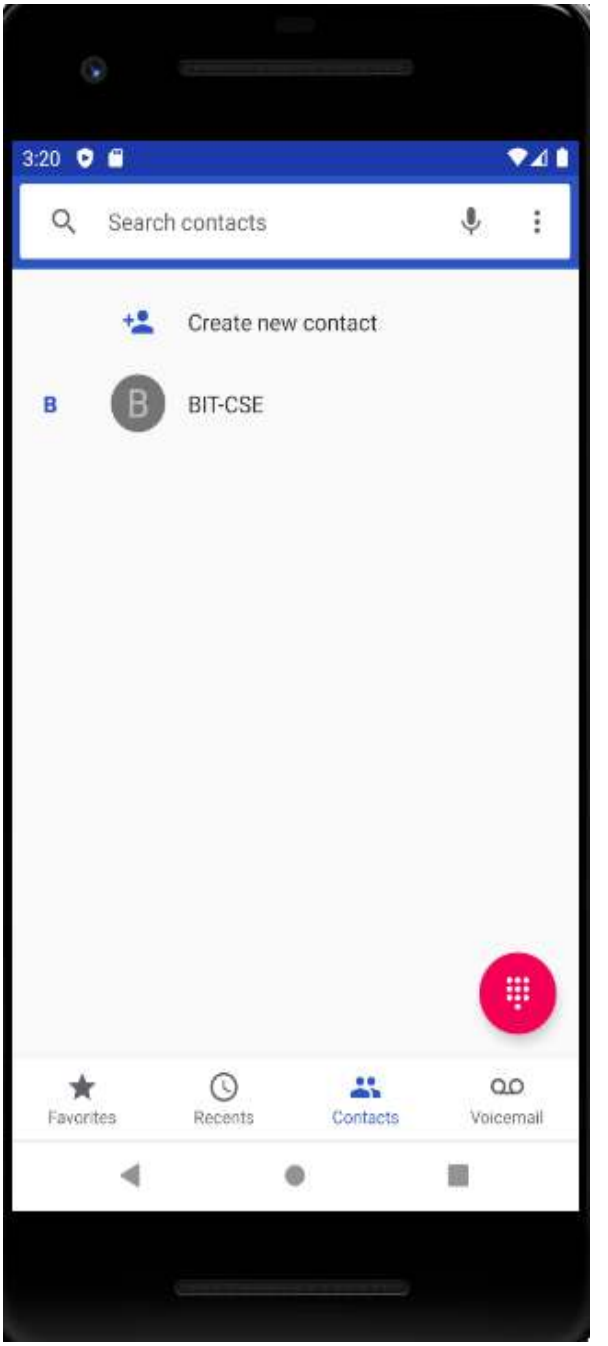

3:11
Create new contact
Add to a contact
Send SMS
08026613237
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PQRS
8 TUV
9 WXYZ
*
0 +
#


3:12
08026613237
00:03
Mute
Keypad
Speaker
Add call
Hold


3:15
08026613237
On hold
(266) 158-65
00:11
Mute
Keypad
Speaker
Merge
Swap


3:16
Conference call
03:45
Mute
Keypad
Speaker
Add call
Manage
Hold


3:19
Create new contact
SAVE
BIT-CSE
Last name
(266) 132-37
Mobile
Phone
Home
GIF


3:20
Search contacts
Create new contact
B
BIT-CSE
Favorites
Recents
Contacts
Voicemail