ATRIA INSTITUTE OF TECHNOLOGY

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"MOBILE APPLICATION DEVELOPMENT LAB MANUAL"

(18CSMP68)

As per VTU Revised Syllabus

PREPARED BY

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SYLLABUS

MOBILE APPLICATION DEVELOPMENT

(Effective from the academic year 2018 -2019)

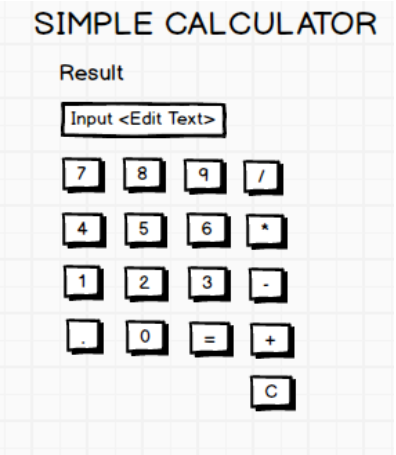
SEMESTER – VI

Course Code-18CSMP68, IA Marks 40, Exam Marks 60.

PART A

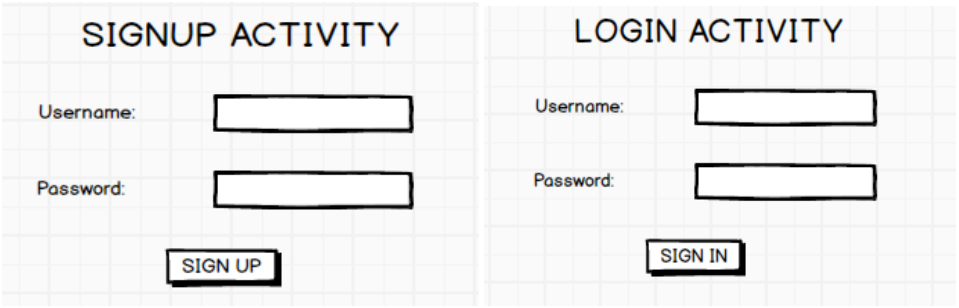
1. Create an application to design a Visiting Card. The Visiting card should have a company logo at the top right corner. The company name should be displayed in Capital letters, aligned to the centre. Information like the name of the employee, job title, phone number, address, email, fax and the website 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, TextView, EditText for designing a calculator having basic functionality like Addition, Subtraction, Multiplication, and Division.

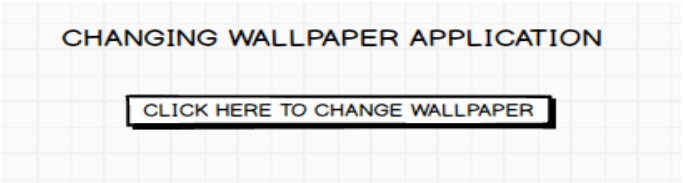


3. Create a SIGN Up activity with Username and Password. Validation of password should happen based on the following rules:
   - **a.** Password should contain uppercase and lowercase letters.
   - **b.** Password should contain letters and numbers.
   - **c.** Password should contain special characters.
   - **d.** 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.

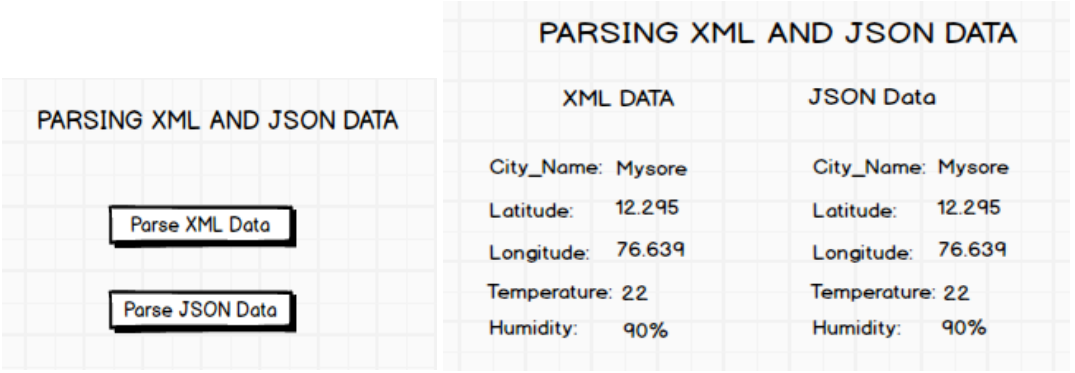


4. Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 seconds.

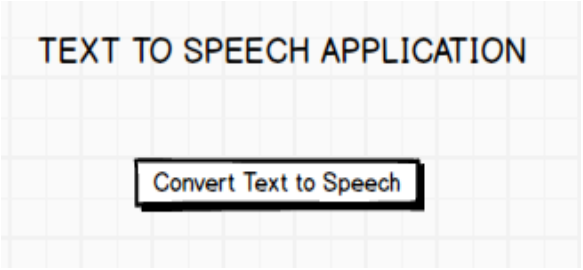


5. Write a program to create an activity with two buttons START and STOP. On pressing of the START button, the activity must start the counter by displaying the numbers from One and the counter must keep on counting until the STOP button is pressed. Display the counter value in a TextView control.

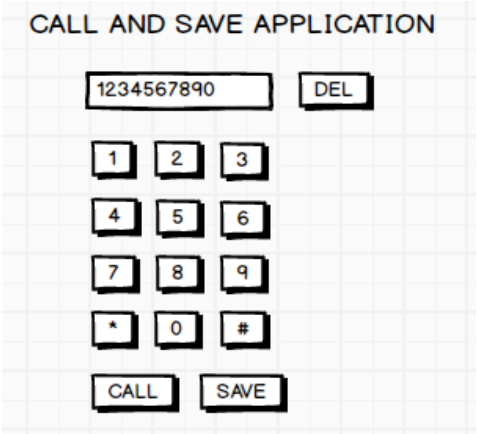
6. Create two files of XML and JSON type with values for City_Name, Latitude, Longitude, Temperature, and Humidity. Develop an application to create an activity with two buttons to parse the XML and JSON files which when clicked should display the data in their respective layouts side by side.



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

(Taken as mini project)

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 Date Picker 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 EditText 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 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 EditText 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 TextView. Also, calculate the EMI by varying the Loan Term and Interest Rate values.

CONTENTS

Program-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 centre. Information like the name of the employee, job title, phone number, address, email, fax and the website address are to be displayed. Insert a horizontal line between the job title and the phone number.

1) Firstly, Create an Application by Name "VisitingCardApp"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component change the following properties:
    - Size: 38dp
    - Text: AIT
    - Align left top

4) Add ImageView to design and in type choose "IC_LAUNCHER_FOREGROUND"
    - Download the logo & copy the same in res->drawable folder
    - In xml code of imageview change srcCompat="@drawable/logo"
    - Align right top

5) Add View component & change the following properties:
    - Height: 4dp
    - Background: "#4444" (black color)

6) Add TextView component change the following properties:
    - Size: 20dp
    - Text: Uzma Sulthana
    - Style: Bold
    - Align center

7) Add TextView component change the following properties:
    - Size: 24sp
    - Text: Assistant Professor-ISE
    - Align center

8) Add TextView component change the following properties:
    - Size: 24dp
    - Text: Address: ASKB Campus, Anandnagar, | Bangalore-560024
    - Align: center

9) Add TextView component change the following properties:
    - Size: 24sp
    - Text: Email-uzma.sulthana@atria.edu
    - Align: center

10) Add TextView component change the following properties:
- Size: 24sp
- Text: Phone-9108380566

XML-CODE

```
<?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"
    android:background="#FFFFFF"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView4"
        android:layout_width="371dp"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_alignParentLeft="true"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginStart="28dp"
        android:layout_marginLeft="28dp"
        android:layout_marginEnd="12dp"
        android:layout_marginRight="12dp"
        android:layout_marginBottom="219dp"
        android:text="Address:ASKB Campus, Anandnagar, | Bangalore - 560 024"
        android:textAlignment="center"
        android:textSize="24sp" />

    <TextView
        android:id="@+id/textView5"
        android:layout_width="250dp"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_alignParentLeft="true"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginStart="87dp"
        android:layout_marginLeft="87dp"
        android:layout_marginEnd="73dp"
        android:layout_marginRight="73dp"
```

```
    android:layout_marginBottom="157dp"
    android:text="Ph No: 9108380566"
    android:textAlignment="center"
    android:textSize="24sp" />

<TextView
    android:id="@+id/textView6"
    android:layout_width="367dp"
    android:layout_height="wrap_content"
    android:layout_alignParentStart="true"
    android:layout_alignParentLeft="true"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginStart="25dp"
    android:layout_marginLeft="25dp"
    android:layout_marginEnd="19dp"
    android:layout_marginRight="19dp"
    android:layout_marginBottom="64dp"
    android:text="Email Id: uzma.sulthana@atria.edu"
    android:textAlignment="center"
    android:textSize="24sp" />

<TextView
    android:id="@+id/textView3"
    android:layout_width="367dp"
    android:layout_height="66dp"
    android:layout_alignParentStart="true"
    android:layout_alignParentLeft="true"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginStart="32dp"
    android:layout_marginLeft="32dp"
    android:layout_marginEnd="12dp"
    android:layout_marginRight="12dp"
    android:layout_marginBottom="287dp"
    android:text="Assistant Professor-ISE"
    android:textAlignment="center"
    android:textSize="24sp" />

<ImageView
    android:id="@+id/imageView3"
    android:layout_width="155dp"
    android:layout_height="98dp"
    android:layout_alignParentEnd="true"
```

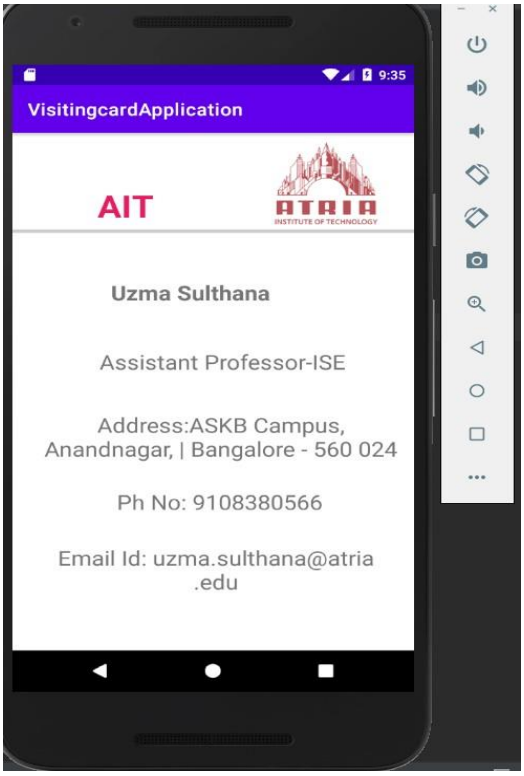
```
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="12dp"
    android:layout_marginRight="12dp"
    android:layout_marginBottom="495dp"
    app:srcCompat="@drawable/aitlogo" />

<View
    android:id="@+id/view"
    android:layout_width="wrap_content"
    android:layout_height="4dp"
    android:layout_alignParentBottom="true"
    android:layout_marginBottom="487dp"
    android:background="#4444" />

<TextView
    android:id="@+id/textView2"
    android:layout_width="176dp"
    android:layout_height="wrap_content"
    android:layout_alignParentStart="true"
    android:layout_alignParentLeft="true"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginStart="95dp"
    android:layout_marginLeft="95dp"
    android:layout_marginEnd="140dp"
    android:layout_marginRight="140dp"
    android:layout_marginBottom="401dp"
    android:text="Uzma Sulthana"
    android:textAlignment="center"
    android:textSize="24sp"
    android:textStyle="bold" />

<TextView
    android:id="@+id/textView7"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="99dp"
    android:layout_marginRight="99dp"
    android:layout_marginBottom="495dp"
    android:layout_toStartOf="@+id/imageView3"
    android:layout_toLeftOf="@+id/imageView3"
    android:text="AIT"
    android:textColor="#E91E63"
```

```
        android:textSize="36sp"
        android:textStyle="bold" />

</RelativeLayout>
```

JAVA-CODE

```
package com.example.visitingcardapplication;

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-2:

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

1) Firstly, Create an Application by Name "calciApplication"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component & change the following properties:
   - Size: 36sp
   - Text: Simple Calci
   - Center-Align
4) Add PlainText(EditText) component & change the following properties in XML Code:
   - Text: ""
   - Hint: "Enter the Number 1"
   - id: "@+id/editText1"
5) Add PlainText(EditText) component & change the following properties in XML Code:
   - Text: ""
   - Hint: "Enter the Number 2 "
   - id: "@+id/editText2"
6) Add TextView component to display result & change the following properties:
   - Size: 40dp
   - Text: "0"
   - Center-Align
   - id: "@+id/textView1"
7) Add 4 Buttons & rename the four buttons "Add", "Sub","Mul" and "div" with following addition:
   - Onclick: "doAdd"(Add Button)
   - Onclick: "doSub"(Sub Button)
   - Onclick: "doMul"(Mul Button)
   - Onclick: "doDiv"(Div Button)

XML-CODE

```
<?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:layout_width="209dp"
        android:layout_height="60dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
```

```
    android:layout_marginEnd="108dp"
    android:layout_marginRight="108dp"
    android:layout_marginBottom="530dp"
    android:text="Simple Calci"
    android:textSize="36sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

<EditText
    android:id="@+id/editText2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="115dp"
    android:layout_marginRight="115dp"
    android:layout_marginBottom="364dp"
    android:ems="10"
    android:hint="Enter the Number 2"
    android:inputType="textPersonName"
    android:text=""
    android:textColorHighlight="#FFFFFF" />

<EditText
    android:id="@+id/editText1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="110dp"
    android:layout_marginRight="110dp"
    android:layout_marginBottom="439dp"
    android:ems="10"
    android:hint="Enter the Number 1"
    android:inputType="textPersonName"
    android:text=""
    android:textColorHighlight="#FFFFFF" />

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

```
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="260dp"
    android:layout_marginRight="260dp"
    android:layout_marginBottom="175dp"
    android:text="ADD"
    android:textStyle="bold"
    android:onClick="add"
    app:backgroundTint="#E8F381" />

<Button
    android:id="@+id/button3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="266dp"
    android:layout_marginRight="266dp"
    android:layout_marginBottom="61dp"
    android:text="MUL"
    android:onClick="mul"
    app:backgroundTint="#A1FAA4" />

<Button
    android:id="@+id/button4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="108dp"
    android:layout_marginRight="108dp"
    android:layout_marginBottom="63dp"
    android:text="DIV"
    android:onClick="div"
    app:backgroundTint="#E6C28C" />

<Button
    android:id="@+id/button2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
```

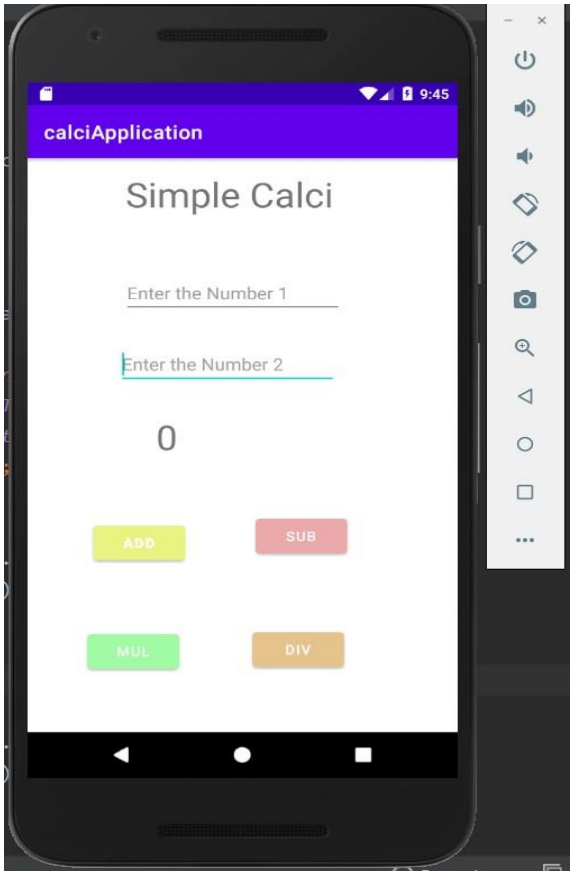
```
        android:layout_marginEnd="105dp"
        android:layout_marginRight="105dp"
        android:layout_marginBottom="182dp"
        android:text="SUB"
        android:onClick="sub"
        app:backgroundTint="#ECA9A9" />

    <TextView
        android:id="@+id/tv1"
        android:layout_width="86dp"
        android:layout_height="61dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="202dp"
        android:layout_marginRight="202dp"
        android:layout_marginBottom="274dp"
        android:text="0"
        android:textSize="36sp" />

</RelativeLayout>
```

JAVA-CODE

```
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
EditText e1,e2;
TextView tv;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        e1  =(EditText)findViewById(R.id.editText1);
        e2 = (EditText)findViewById(R.id.editText2);
        tv= (TextView)findViewById(R.id.tv1);
    }
    public void add(View v){
        int  a1=Integer.parseInt(e1.getText().toString());
        int a2= Integer.parseInt(e2.getText().toString());
        int result=a1+a2;
```

```
        tv.setText(""+result);
    }
    public void sub(View v){
        int  a1=Integer.parseInt(e1.getText().toString());
        int a2= Integer.parseInt(e2.getText().toString());
        int result=a1-a2;
        tv.setText(""+result);
    }
    public void mul(View v){
        int  a1=Integer.parseInt(e1.getText().toString());
        int a2= Integer.parseInt(e2.getText().toString());
        int result=a1*a2;
        tv.setText(""+result);
    }
    public void div(View v){
        float  a1=Integer.parseInt(e1.getText().toString());
        float a2= Integer.parseInt(e2.getText().toString());
        float result=a1/a2;
        tv.setText(""+result);
    }
}
```

OUTPUT:



Program-3:

Create a SIGNUp 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.

1) Firstly Create an Application by Name "SignUpApplication"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component & change the following properties:
    - Size: 24sp
    - Text: "Sign Up"
    - Center-Align
4) Add Email (EditText) component & change the following properties in XML Code:
    - Hint: "Email-ID"
    - id: "@+id/emailEditText"
5) Add Password (EditText) component & change the following properties in XML Code:
    - Hint: "Password"
    - id: "@+id/passwordEditText"
6) Add Button component & change the following properties in XML
    - Id: "@+id/signBtn"
    - Text: "Sign Up"

XML-CODE

```
<?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:layout_width="129dp"
        android:layout_height="45dp"
        android:layout_alignParentEnd="true"
```

```
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="168dp"
    android:layout_marginRight="168dp"
    android:layout_marginBottom="596dp"
    android:text="Sign Up"
    android:textSize="24sp"
    android:textStyle="bold"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

<EditText
    android:id="@+id/SignUp_email"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="114dp"
    android:layout_marginRight="114dp"
    android:layout_marginBottom="464dp"
    android:ems="10"
    android:hint="EmailId"
    android:inputType="textPersonName" />

<Button
    android:id="@+id/signUpBtn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="168dp"
    android:layout_marginRight="168dp"
    android:layout_marginBottom="245dp"
    android:text="Sign Up" />

<EditText
    android:id="@+id/SignUp_Password"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
```

```
        android:layout_marginEnd="101dp"
        android:layout_marginRight="101dp"
        android:layout_marginBottom="385dp"
        android:ems="10"
        android:hint="Password"
        android:inputType="textPassword" />

</RelativeLayout>
```

JAVA-CODE

```
package com.example.signupapplication;
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;
import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity {
    EditText email_Sign, password_Sign;
    Button signUp_btn;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        email_Sign=(EditText)findViewById(R.id.SignUp_email);
        password_Sign=(EditText)findViewById(R.id.SignUp_Password);
        signUp_btn =(Button)findViewById(R.id.signUpBtn);
        signUp_btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String email = email_Sign.getText().toString();
                String password = password_Sign.getText().toString();
                if(!isValidPassword(password)) {
                    Toast.makeText(MainActivity.this,"Password doesn't match
rules",Toast.LENGTH_SHORT).show();
                    return;
                }
                Intent intent = new Intent(MainActivity.this,loginActivity.class);
                intent.putExtra("email",email);
                intent.putExtra("password",password);
```

```
            startActivity(intent);
        }
    });
}
Pattern lowerCase= Pattern.compile("^.*[a-z].*$");
Pattern upperCase=Pattern.compile("^.*[A-Z].*$");
Pattern number = Pattern.compile("^.*[0-9].*$");
Pattern special_Chara = Pattern.compile("^.*[^a-zA-Z0-9].*$");
private Boolean isValidPassword(String password){
    if(password.length()<8) {
        return false;
    }
    if(!lowerCase.matcher(password).matches()) {
        return false;
    }
    if(!upperCase.matcher(password).matches()) {
        return false;
    }
    if(!number.matcher(password).matches()) {
        return false;
    }
    if(!special_Chara.matcher(password).matches()) {
        return false;
    }
     return true;
 }
}
```

1) **Right click on Java folder-> new-> activity->empty activity-> name it as "LoginActivity"**
2) **Go to xml code of design change the layout to "RelativeLayout"**
3) **Add TextView component & change the following properties:**
   - **Size: 38dp**
   - **Text: "Login"**
   - **Center-Align**
4) **Add Email (EditText) component & change the following properties in XML Code:**
   - **Hint: "Email ID"**
   - **id: "@+id/emailEditText"**
5) **Add Password (EditText) component & change the following properties in XML Code:**
   - **Hint: "Password"**
   - **id: "@+id/passwordEditText"**
6) **Add Button component & change the following properties in XML**
   - **Id: "@+id/loginBtn"**
   - **Text: "Login"**

XML-CODE

```
<?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=".loginActivity">

    <TextView
        android:id="@+id/loginTextView"
        android:layout_width="225dp"
        android:layout_height="45dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="113dp"
        android:layout_marginRight="113dp"
        android:layout_marginBottom="544dp"
        android:text="Login"
        android:textSize="30sp"
        android:textStyle="bold"
        app:layout_constraintBottom_toBottomOf="parent"
        tools:layout_editor_absoluteX="143dp" />

    <EditText
        android:id="@+id/passEditText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="124dp"
        android:layout_marginRight="124dp"
        android:layout_marginBottom="380dp"
        android:ems="10"
        android:hint="password"
        android:inputType="textPassword" />

    <Button
        android:id="@+id/loginBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
```

```
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="218dp"
        android:layout_marginRight="218dp"
        android:layout_marginBottom="263dp"
        android:text="Login" />

    <EditText
        android:id="@+id/EmaileditText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="127dp"
        android:layout_marginRight="127dp"
        android:layout_marginBottom="455dp"
        android:ems="10"
        android:hint="Email ID"
        android:inputType="textPersonName" />
</RelativeLayout>
```

JAVA-CODE

```
package com.example.signupapplication;
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 loginActivity extends AppCompatActivity {
    EditText emailEditText,passwordEditText;
    Button login_btn;
    int counter=2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_login2);
        emailEditText=(EditText)findViewById(R.id.EmaileditText);
        passwordEditText=(EditText)findViewById(R.id.passEditText);
        login_btn=(Button)findViewById(R.id.loginBtn);
        String registeredEmail = getIntent().getStringExtra("email");
        String registeredPassword= getIntent().getStringExtra("password");
        login_btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
```

```
            String email = emailEditText.getText().toString();
            String password = passwordEditText.getText().toString();
            if(registeredEmail.equals(email) && registeredPassword.equals(password))
            {
               Intent intent= new Intent(loginActivity.this,loginsuccessActivity.class);
               startActivity(intent);
            }
            else {
               Toast.makeText(loginActivity.this,"Invalid
Credentials",Toast.LENGTH_SHORT).show();
            }
            counter--;
            if(counter==0){
               Toast.makeText(getBaseContext(),"failed to login
attempts",Toast.LENGTH_SHORT).show();
            login_btn.setEnabled(false);
            }
         }
      });
   }
}
```

1) **Right click on Java folder-> new-> activity->empty activity-> name it as "LoginSuccessful"**
2) **Go to xml code of design change the layout to "RelativeLayout"**
3) **Add TextView component & change the following properties:**
   - **Size: 38dp**
   - **Text: "Login Successful"**
   - **Center-Align**

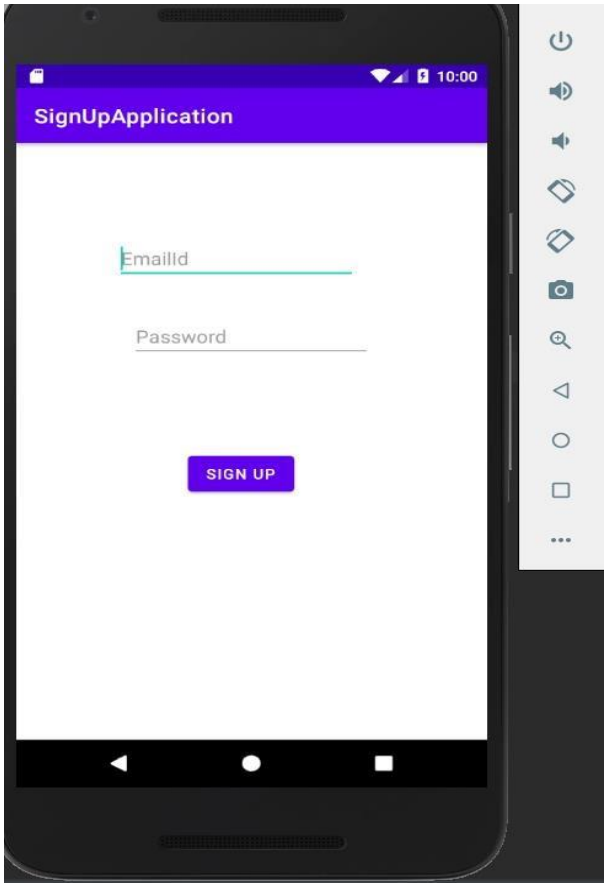
XML-CODE

```
<?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=".loginsuccessActivity">
   <TextView
      android:id="@+id/textView"
      android:layout_width="match_parent"
      android:layout_height="121dp"
      android:layout_alignParentEnd="true"
      android:layout_alignParentRight="true"
      android:layout_alignParentBottom="true"
      android:layout_marginEnd="-11dp"
      android:layout_marginRight="-11dp"
```

```
        android:layout_marginBottom="322dp"
        android:text="Login Successful"
        android:textSize="36sp"
        android:textStyle="bold" />
</RelativeLayout>
```

JAVA-CODE

```
package com.example.signupapplication;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
public class loginsuccessActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_loginsuccess);
    }
}
```



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.

1) Firstly Create an Application by Name “WallpaperActivity”
2) Go to xml code of design change the layout to “RelativeLayout”
3) Add TextView component & change the following properties:
   - Size: 38dp
   - Text: Wall Paper Change Application
   - Center-Align
4) Add Button component & change the following properties:
   - Size: 38dp
   - Text: Click Here To Change Wall Paper
5) Save five images (jpg format) in the drawable folder. In this example one.jpg, two.jpg, three.jpg, four.jpg and five.jpg images are saved in drawable folder.

XML-CODE

```
<?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">


    <Button
        android:id="@+id/button1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="167dp"
        android:layout_marginRight="167dp"
        android:layout_marginBottom="409dp"
        android:text="CLICK HERE" />
</RelativeLayout>
```

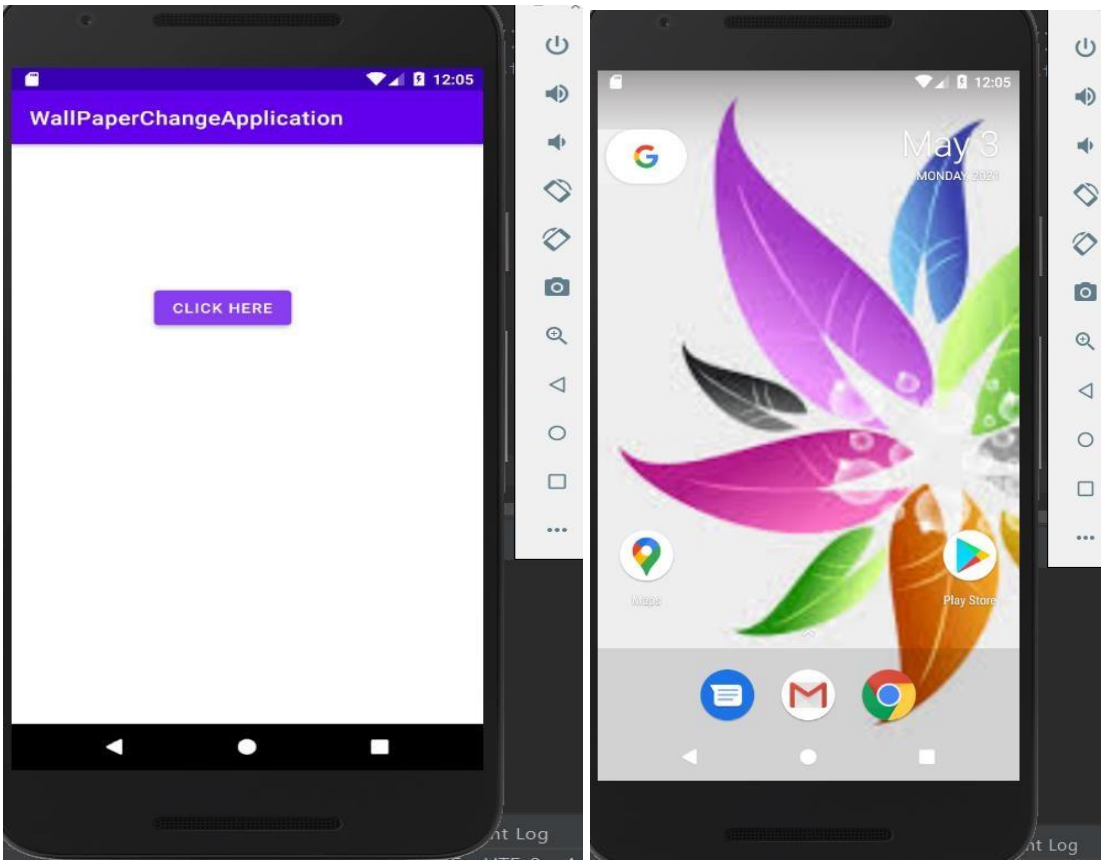
JAVA-CODE

```
package com.example.wallpaperchangeapplication;
import androidx.appcompat.app.AppCompatActivity;
import android.app.WallpaperManager;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
```

```
import android.graphics.drawable.BitmapDrawable;
import android.graphics.drawable.Drawable;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;
import java.io.IOException;
import java.util.Timer;
import java.util.TimerTask;

public class MainActivity extends AppCompatActivity {
    Button wallpaperChange;
    Timer mytimer;
    Drawable drawable;
    WallpaperManager wpm;
    int prev=1;

        @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        mytimer=new Timer();
        wpm = WallpaperManager.getInstance(this);
        wallpaperChange=(Button)findViewById(R.id.button1);
        wallpaperChange.setOnClickListener(new View.OnClickListener() {
            @Override public void onClick(View view) {
            setwallpaper();
        }
        });
    }

    private void setwallpaper() {
        Toast.makeText(this,"setting Wallpaper please wait.",Toast.LENGTH_LONG).show();

         mytimer.schedule(new TimerTask() {
            @Override
            public void run()
           {

              if(prev==1) {
                 drawable = getResources().getDrawable(R.drawable.i1); prev = 2;
              }
              else if(prev==2) {
                 drawable = getResources().getDrawable(R.drawable.i2); prev=3;
              }
```

```
            else if(prev==3) {
               drawable = getResources().getDrawable(R.drawable.i3); prev=4;
            }
            else if(prev==4) {
               drawable = getResources().getDrawable(R.drawable.i4); prev=5;
            }
            else if(prev==5) {
               drawable = getResources().getDrawable(R.drawable.i5); prev=1;
            }
            Bitmap wallpaper = ((BitmapDrawable)drawable).getBitmap(); try {
            wpm.setBitmap(wallpaper);
         }
         catch (IOException e)
         { e.printStackTrace();
         }
         }
      },0,30000);
      }
   }
```

OUTPUT:



Program-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 TextViewcontrol.

1) Firstly Create an Application by Name “CounterActivity”
2) Go to xml code of design change the layout to “RelativeLayout”
3) Add TextView component & change the following properties:
   - Size: 38dp
   - Text: “Counter Application”
   - Center-Align
4) Add TextView component & change the following properties:
   - Text: “Counter Value”
5) Add Button components & change the following properties:
   - Size: 38dp
   - Text: Start
   - id: “@+id/btn_start”
6) Add Button components & change the following properties:
   - Size: 38dp
   - Text: Stop
   - id: “@+id/btn_stop”

XML-CODE

```
<?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/textView1"
        android:layout_width="332dp"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_alignParentLeft="true"
```

```
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginStart="41dp"
    android:layout_marginLeft="41dp"
    android:layout_marginEnd="38dp"
    android:layout_marginRight="38dp"
    android:layout_marginBottom="516dp"
    android:text="Counter Application"
    android:textSize="36sp"
    android:textStyle="bold" />

<Button
    android:id="@+id/button1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="236dp"
    android:layout_marginRight="236dp"
    android:layout_marginBottom="89dp"
    android:text="Start"
    android:textSize="30sp"
    app:backgroundTint="#4CAF50" />

<Button
    android:id="@+id/button2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="55dp"
    android:layout_marginRight="55dp"
    android:layout_marginBottom="92dp"
    android:text="STOP"
    android:textSize="30sp"
    app:backgroundTint="#EC5449" />

<TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
```

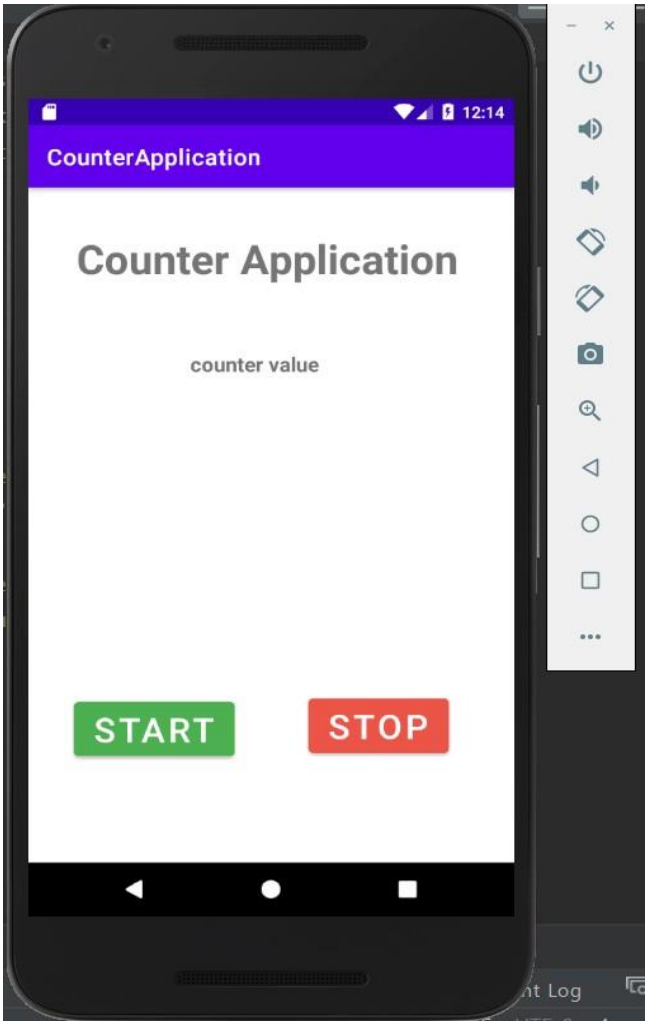
```
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="165dp"
        android:layout_marginRight="165dp"
        android:layout_marginBottom="434dp"
        android:text="counter value"
        android:textSize="18sp"
        android:textStyle="bold" />
</RelativeLayout>
```

JAVA-CODE

```
package com.example.counterapplication;

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 {
    TextView txtCounter;
    Button btn_start,btn_stop;
    int count=0;
    Handler customHandler=new Handler();
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        txtCounter= (TextView)findViewById(R.id.textView2);
        btn_start =(Button)findViewById(R.id.button1);
        btn_stop=(Button)findViewById(R.id.button2);
        btn_start.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
            customHandler.postDelayed(updateTimerThread,0);
            }
        });
        btn_stop.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                customHandler.removeCallbacks(updateTimerThread);
            }
        });
        }
```

```
private final Runnable updateTimerThread =new Runnable() {
    @Override
    public void run() {
        txtCounter.setText(""+count);
        customHandler.postDelayed(this,1000);
        count++;
    }
};
}
```

OUTPUT:



Program-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.

1) Firstly, Create an Application by Name "JsonParser"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component & change the following properties:
   1) Size: 38dp
   2) Text: XML and JSON Parser
   3) Center-Align
4) Add Two Buttons to Design & change the name "ParseXml" & "ParseJson" with following onclick functions:
   - ParseXml-Button: parsexml
   - ParseJson-Button: parsejson
5) Add TextView component & change the following properties:
   - Id: display
   - Text: ""
   - Align: Center
6) Add Assets folder by following the given hierarchy:
   App->new->folder->Assests folder
7) Inside the assets folder create new files of xml and json using the following hierarchy:
   new->file->city.xml
   new->file->city.json

   once created place the following details inside the "city.xml" and "city.json"

city.xml:

```
<?xml version="1.0"?>
<records>
   <place>
      <name>Mysore</name>
      <lat>12.295</lat>
      <long>76.639</long>
      <temperature>22</temperature>
      <humidity>90%</humidity>
   </place>
   <place>
      <name>Bangalore</name>
      <lat>13.295</lat>
      <long>77.639</long>
```

```
    <temperature>25</temperature>
    <humidity>74%</humidity>
  </place>
</records>
```

city.json:

```
[
 {
  "name":"HASSAN",
  "lat":"12.295",
  "long":"76.639",
  "temperature":"22",
  "humidity":"92%"
 },
 {
  "name":"MANDYA",
  "lat":"10.11",
  "long":"66.639",
  "temperature":"24",
  "humidity":"82%"
 }
]
```

XML-CODE:

```
<?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="257dp"
```

```
        android:layout_height="59dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="74dp"
        android:layout_marginBottom="453dp"
        android:text="PARSER"
        android:textSize="36sp"
        tools:layout_editor_absoluteX="194dp"
        tools:layout_editor_absoluteY="126dp" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="260dp"
        android:layout_marginBottom="371dp"
        android:backgroundTint="#F1B763"
        android:onClick="parsexml"
        android:text="XML"
        android:textAlignment="center" />

    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="118dp"
        android:layout_marginBottom="373dp"
        android:backgroundTint="#CDDC39"
        android:onClick="parsejson"
        android:text="JSON"
        android:textAlignment="center" />

    <TextView
        android:id="@+id/display"
        android:layout_width="402dp"
        android:layout_height="332dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="9dp"
        android:layout_marginBottom="11dp"
        android:textAlignment="center"
        android:textColor="#EF3A78" />
</RelativeLayout>
```

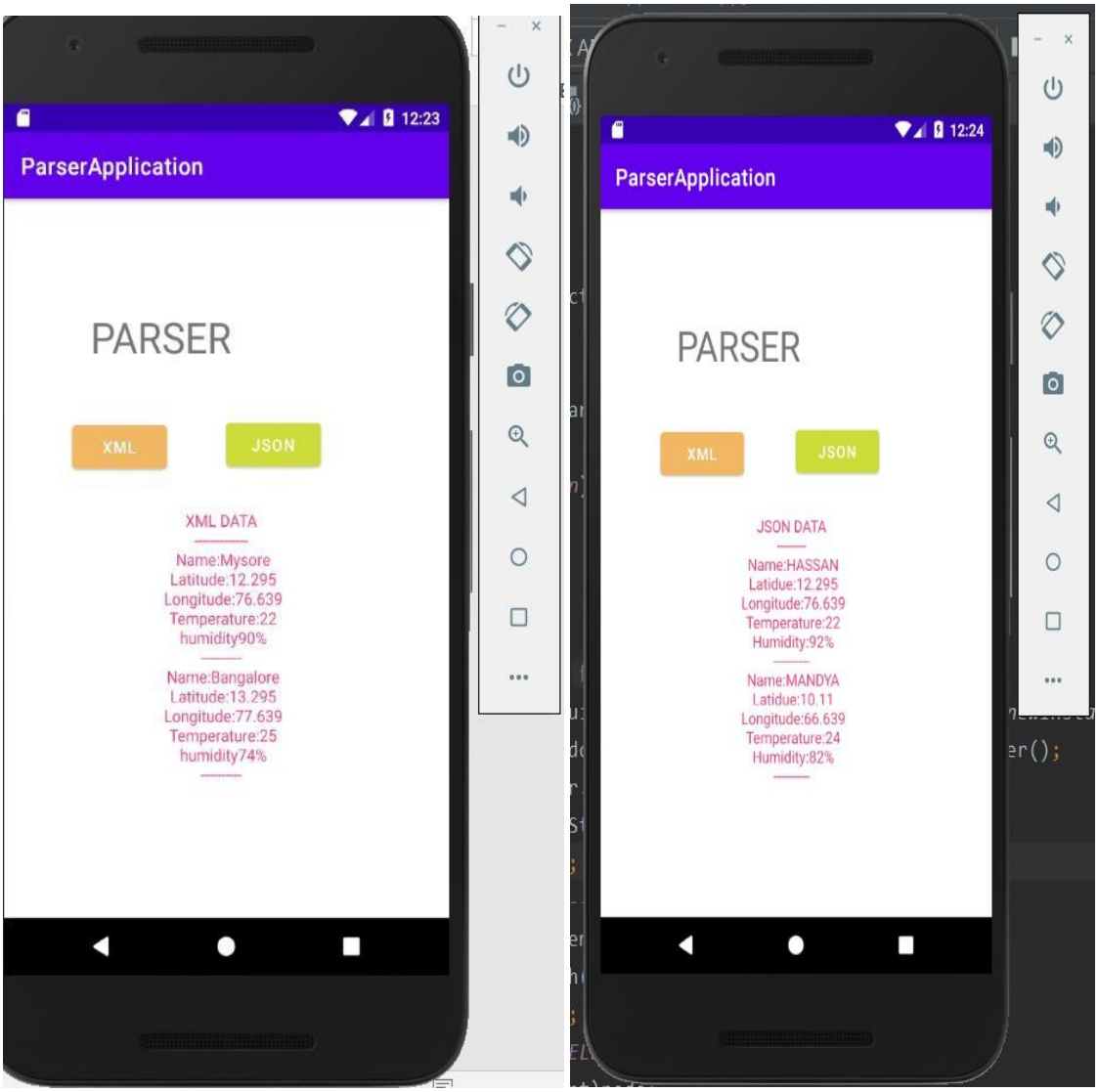
JAVA-CODE

```
package com.example.parserapplication;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.TextView;
import android.widget.Toast;
import org.json.JSONArray;
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 java.io.InputStream;
import java.nio.charset.StandardCharsets;
import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;
public class MainActivity extends AppCompatActivity {
   TextView display;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      display=findViewById(R.id.display);
   }
   public void parsexml(View v){
      try {
         InputStream is=getAssets().open("city.xml");
         DocumentBuilderFactory documentBuilderFactory =
DocumentBuilderFactory.newInstance();
         DocumentBuilder
documentBuilder=documentBuilderFactory.newDocumentBuilder();
         Document document=documentBuilder.parse(is);
         StringBuilder stringBuilder=new StringBuilder();
         stringBuilder.append("XML DATA");
         stringBuilder.append("\n ----------");
         NodeList nodeList=document.getElementsByTagName("place");
         for(int i=0; i<nodeList.getLength();i++){
            Node node = nodeList.item(i);
            if(node.getNodeType()==Node.ELEMENT_NODE){
               Element element = (Element)node;
               stringBuilder.append("\n Name:").append(getValue("name",element));
               stringBuilder.append("\n Latitude:").append(getValue("lat",element));
               stringBuilder.append("\n Longitude:").append(getValue("long",element));
```

```
                stringBuilder.append("\n
Temperature:").append(getValue("temperature",element));
                stringBuilder.append("\n humidity").append(getValue("humidity",element));
                stringBuilder.append("\n ---------");

            }
        }
        display.setText(stringBuilder.toString());
    }
    catch (Exception e){
        e.printStackTrace();
        Toast.makeText(MainActivity.this,"Error in reading XML
FILE",Toast.LENGTH_LONG).show();
    }
  }
  public void parsejson(View V){
    String json;
    StringBuilder stringBuilder = new StringBuilder();
    try {
        InputStream is = getAssets().open("city.json");
        int size=is.available();
        byte[] buffer=new byte[size];
        is.read(buffer);
        json = new String(buffer, StandardCharsets.UTF_8);
        JSONArray jsonArray = new JSONArray(json);
        stringBuilder.append("JSON DATA");
        stringBuilder.append("\n -------");
        for(int i=0;i<jsonArray.length();i++){
            JSONObject jsonObject = jsonArray.getJSONObject(i);
            stringBuilder.append("\n Name:").append(jsonObject.getString("name"));
            stringBuilder.append("\n Latidue:").append(jsonObject.getString("lat"));
            stringBuilder.append("\n Longitude:").append(jsonObject.getString("long"));
            stringBuilder.append("\n
Temperature:").append(jsonObject.getString("temperature"));
            stringBuilder.append("\n Humidity:").append(jsonObject.getString("humidity"));
            stringBuilder.append("\n ---------");
        }
        display.setText(stringBuilder.toString());
        is.close();
    }

    catch (Exception e){
        e.printStackTrace();
        Toast.makeText(MainActivity.this,"Error in reading JSON
file",Toast.LENGTH_LONG).show();
    }
```

```
    }
    private String getValue(String tag,Element element){
return
element.getElementsByTagName(tag).item(0).getChildNodes().item(0).getNodeValue();
    }
}
```

OUTPUT:



Program-7:

Develop a simple application with one EditText 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.

1) Firstly Create an Application by Name "TextToSpeech"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component & change the following properties:
4) Size: 38dp
5) Text: Text2Speech App
6) Center-Align
7) Add PlainText(EditText) component & change the following properties in XML Code:
   - Text: ""
   - Hint: "Enter the text to be converted"
   - id: "@+id/editText"
8) Add Button component & change the following properties in XML Code:
   - Name: Convert
   - onClick: convert

XML-CODE:

```
<?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="335dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="21dp"
        android:layout_marginBottom="486dp"
        android:text="Text2Speech"
        android:textSize="30sp" />

    <EditText
        android:id="@+id/editText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
```

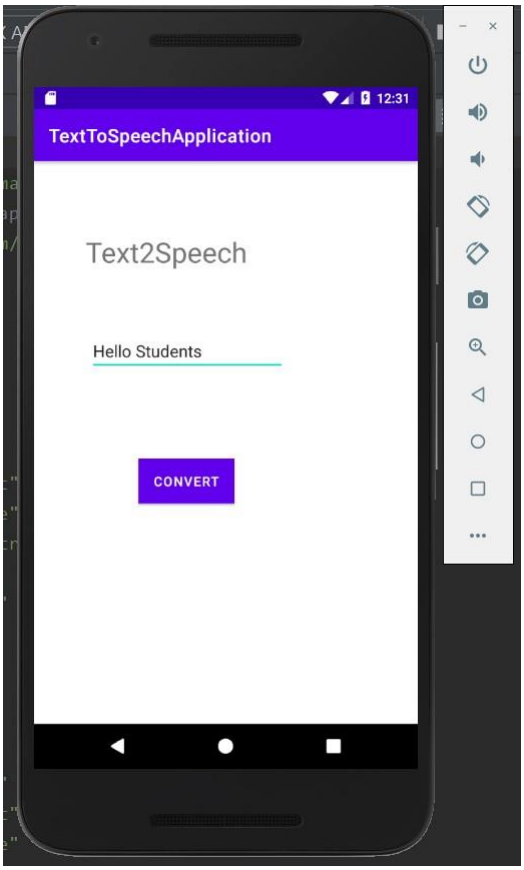
```
        android:layout_marginEnd="142dp"
        android:layout_marginBottom="377dp"
        android:ems="10"
        android:hint="Enter text here"
        android:inputType="textPersonName" />

    <Button
        android:id="@+id/convert"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="196dp"
        android:layout_marginBottom="236dp"
        android:onClick="convert"
        android:background="#6CEC71"
        android:text="CONVERT" />

</RelativeLayout>
```

JAVA-CODE:

```
package com.example.texttospeechapplication;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.speech.tts.TextToSpeech;
import android.view.View;
import android.widget.EditText;
import java.util.Locale;

public class MainActivity extends AppCompatActivity {
    EditText e1;
    TextToSpeech t1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        e1=findViewById(R.id.editText);
        t1=new TextToSpeech(getApplicationContext(), new TextToSpeech.OnInitListener()
{
            @Override
            public void onInit(int status) {
```

```
            if(status!=TextToSpeech.ERROR){
                t1.setLanguage(Locale.UK);
            }
            }
        });
    }
    public void convert(View V){
        String tospeak=e1.getText().toString();
        t1.speak(tospeak,TextToSpeech.QUEUE_FLUSH,null);
    }
}
```

OUTPUT:



Program-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.

1) Firstly Create an Application by Name "CallActivity"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component & change the following properties:
    - Size: 38dp
    - Text: Call Activity
    - Center-Align
4) Add EditText component & change the following properties in XML Code:
    - id: "@+id/phoneNumberEditText"
5) Add PlainText(EditText) component & change the following properties in XML Code:
    - Text: ""
    - Hint: "Copied Text"
    - id: "@+id/editText2"
6) Add three buttons to the design & change the textof the Buttons to "Clear", "Call", "Save" and change the id as follows:
    - id:"@+id/clearBtn"
    - id:"@+id/callBtn"
    - id:"@+id/saveBtn"
7) Add twelve buttons to the design & change the text of the Buttons as 1,2,3,4,5,6,7,8,9,0,*,#

XML-CODE:

```
<?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:id="@+id/Button11"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:backgroundTint="#4CAF50"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/button8"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="169dp"
        android:layout_marginBottom="201dp"
        android:backgroundTint="#4CAF50"
        android:onClick="inputNumber"
```

```
    android:text="8" />

<Button
    android:id="@+id/Button10"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="286dp"
    android:layout_marginBottom="115dp"
    android:onClick="inputNumber"
    android:backgroundTint="#4CAF50"
    android:text="*" />

<Button
    android:id="@+id/saveBtn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="80dp"
    android:layout_marginBottom="38dp"
    android:backgroundTint="#CDDC39"
    android:text="Save" />

<Button
    android:id="@+id/callBtn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="209dp"
    android:layout_marginBottom="35dp"
    android:backgroundTint="#F44336"
    android:text="Call" />

<Button
    android:id="@+id/clearBtn12"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="159dp"
    android:layout_marginBottom="116dp"
    android:backgroundTint="#4CAF50"
    android:onClick="inputNumber"
    android:text="0" />

<Button
```

```
    android:id="@+id/Button7"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="288dp"
    android:layout_marginBottom="201dp"
    android:onClick="inputNumber"
    android:backgroundTint="#4CAF50"
    android:text="7" />

<Button
    android:id="@+id/Button9"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="38dp"
    android:layout_marginBottom="201dp"
    android:onClick="inputNumber"
    android:backgroundTint="#4CAF50"
    android:text="9" />

<EditText
    android:id="@+id/phoneNumberEditText"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="172dp"
    android:layout_marginBottom="543dp"
    android:onClick="inputNumber"
    android:ems="10"
    android:hint="Phone Number"
    android:inputType="phone" />

<Button
    android:id="@+id/clearBtn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="48dp"
    android:layout_marginBottom="544dp"
    android:backgroundTint="#E91E63"
    android:text="Clear" />

<Button
    android:id="@+id/Button12"
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="38dp"
    android:onClick="inputNumber"
    android:layout_marginBottom="108dp"
    android:backgroundTint="#4CAF50"
    android:text="#" />

<Button
    android:id="@+id/Button1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="291dp"
    android:onClick="inputNumber"
    android:layout_marginBottom="380dp"
    android:backgroundTint="#4CAF50"
    android:text="1" />

<Button
    android:id="@+id/Button4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="289dp"
    android:onClick="inputNumber"
    android:layout_marginBottom="296dp"
    android:backgroundTint="#4CAF50"
    android:text="4" />

<Button
    android:id="@+id/Button5"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="170dp"
    android:onClick="inputNumber"
    android:layout_marginBottom="295dp"
    android:backgroundTint="#4CAF50"
    android:text="5" />

<Button
    android:id="@+id/Button6"
    android:layout_width="wrap_content"
```

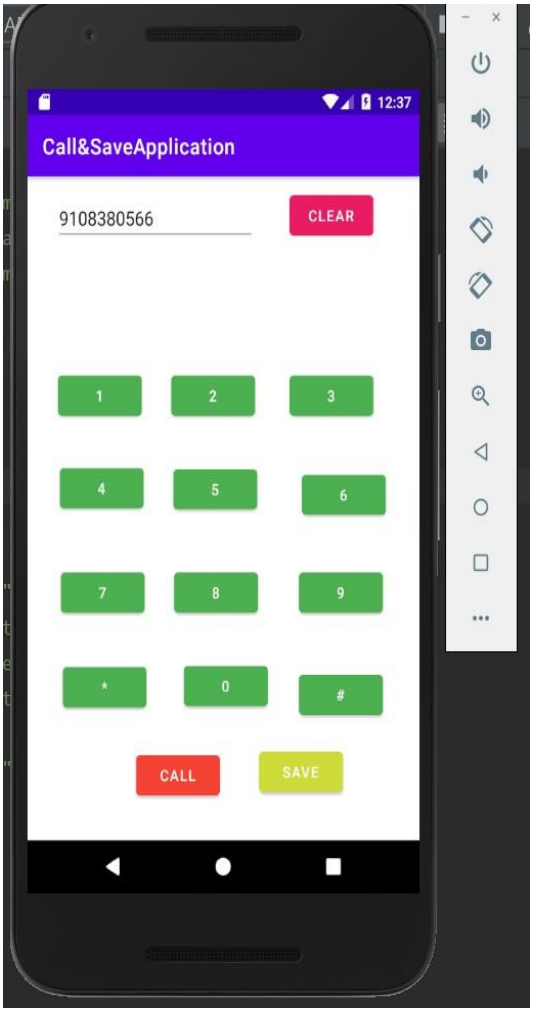
```
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="35dp"
        android:layout_marginBottom="290dp"
        android:onClick="inputNumber"
        android:backgroundTint="#4CAF50"
        android:text="6" />

    <Button
        android:id="@+id/Button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="172dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="380dp"
        android:backgroundTint="#4CAF50"
        android:text="2" />

    <Button
        android:id="@+id/Button3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="48dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="380dp"
        android:backgroundTint="#4CAF50"
        android:text="3" />
</RelativeLayout>
```

JAVA-CODE:

```
package com.example.callsaveapplication;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.provider.ContactsContract;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import java.net.URI;

public class MainActivity extends AppCompatActivity {
EditText phoneNumberEditText;
Button clearBtn,saveBtn,callBtn;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        phoneNumberEditText=findViewById(R.id.phoneNumberEditText);
        clearBtn=findViewById(R.id.clearBtn);
        callBtn=findViewById(R.id.callBtn);
        saveBtn=findViewById(R.id.saveBtn);
        clearBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                phoneNumberEditText.setText("");
            }
        });
        callBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
            String phoneNumber=phoneNumberEditText.getText().toString();
                Intent intent= new Intent(Intent.ACTION_DIAL);
                intent.setData(Uri.parse("tel:"+phoneNumber));
                startActivity(intent);
            }
        });
        saveBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String phoneNumber=phoneNumberEditText.getText().toString();
                Intent intent=new Intent(Intent.ACTION_INSERT);
                intent.setType(ContactsContract.Contacts.CONTENT_TYPE);
                intent.putExtra(ContactsContract.Intents.Insert.PHONE,phoneNumber);
                startActivity(intent);
            }
        });
```

```
    }
    public void inputNumber(View v){
        Button btn=(Button)v;
        String digit=btn.getText().toString();
        String phoneNumber=phoneNumberEditText.getText().toString();
        phoneNumberEditText.setText(phoneNumber+digit);
    }
}
```

OUTPUT:



PART B

Will be continued as Mini Project.