

PART A

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 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.



1. Create a New Android Project with Empty Activity.
2. Open activity_main.xml file from res → layout folder, check/add Linear Layout as the root view.
3. Create layout using nested Relative Layout and TextView.
4. Use View background property to draw the line
5. Add Image to drawable folder and reference the image in the layout using `@drawable/<image_name>`
6. Use android:layout_gravity/android:gravity properties to center the components.

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"
    android:layout_gravity="center"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView3"
        android:layout_width="368dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="57dp"
        android:layout_marginBottom="370dp"
        android:gravity="center"
        android:text="Associate Professor"
        android:textColor="#0337F4"
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.362"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.286" />

    <TextView
        android:id="@+id/textView4"
        android:layout_width="242dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="127dp"
        android:layout_marginBottom="317dp"
        android:gravity="center"
        android:text="9886954954"
        android:textColor="#9C27B0"
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
```

```
app:layout_constraintHorizontal_bias="0.362"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.286" />
```

```
<TextView
    android:id="@+id/textView5"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="90dp"
    android:layout_marginBottom="214dp"
    android:text="girishkumar@bitm.edu.in"
    android:textColor="#FF9800"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.362"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.286" />
```

```
<TextView
    android:id="@+id/textView6"
    android:layout_width="269dp"
    android:layout_height="46dp"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="85dp"
    android:layout_marginBottom="145dp"
    android:text=" www.bitm.edu.in"
    android:textColor="#9C27B0"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.362"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.286" />
```

```
<TextView
    android:id="@+id/textView"
    android:layout_width="117dp"
    android:layout_height="54dp"
```

```
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="268dp"
android:layout_marginBottom="613dp"
android:text="BITM"
android:textColor="#0022FF"
android:textSize="34sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.139"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.097" />
```

<ImageButton

```
android:id="@+id/imageButton"
android:layout_width="192dp"
android:layout_height="93dp"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="48dp"
android:layout_marginBottom="590dp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.836"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.078"
app:srcCompat="@drawable/bitm" />
```

<TextView

```
android:id="@+id/textView2"
android:layout_width="313dp"
android:layout_height="wrap_content"
android:layout_above="@+id/textView3"
android:layout_alignParentEnd="true"
android:layout_marginEnd="77dp"
android:layout_marginBottom="57dp"
android:gravity="center"
android:text=" Dr Girish Kumar "
android:textColor="#0099FF"
android:textSize="30sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.362"
```

```
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.286" />
```

```
<TextView
    android:id="@+id/textView7"
    android:layout_width="313dp"
    android:layout_height="wrap_content"
    android:layout_above="@+id/textView3"
    android:layout_alignParentEnd="true"
    android:layout_marginEnd="75dp"
    android:layout_marginBottom="11dp"
    android:gravity="center"
    android:text="Mr Praveen Kumar"
    android:textColor="#0099FF"
    android:textSize="30sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.362"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.286" />
```

```
<View
    android:id="@+id/divider2"
    android:layout_width="match_parent"
    android:layout_height="5dp"
    android:layout_alignParentBottom="true"
    android:layout_marginBottom="546dp"
    android:background="#ff4567" />
```

```
<View
    android:id="@+id/divider4"
    android:layout_width="match_parent"
    android:layout_height="5dp"
    android:layout_alignParentBottom="true"
    android:layout_marginBottom="286dp"
    android:background="#ff4567" />
```

```
</RelativeLayout>
```

MainActivity.java

```
package com.girish.visitingcard;
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

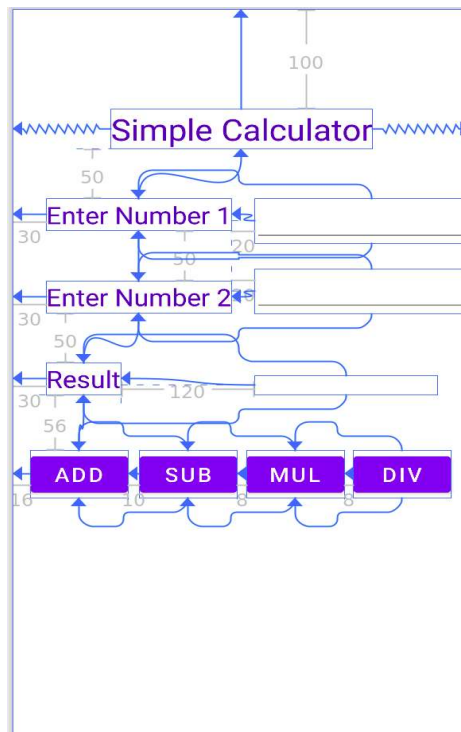


Program 2

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

1. Create a New Android Project with Empty Activity.
2. Open activity_main.xml file from res→layout folder, check/add Constraint Layout as the root view.
3. Create Layout using Drag and Drop framework.
4. Open MainActivity.java file, Override onCreate() method and bring activity_main.xml file on screen using setContentView() and bring the view references using findViewById() method.
5. Add Listeners to Button Click Event:
6. Create a class which implements OnClickListener interface.
7. Override onClick() method of OnClickListener Interface.
8. Register the button for click event by calling setOnClickListener() method of View class and pass the object of the class that implemented OnClickListener Interface.
9. Create a logic to Add/Subtract/Multiply/Divide to perform arithmetic operation.

Design



activity_main.xml

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

    <Button
        android:id="@+id/butSub"
        android:layout_width="89dp"
        android:layout_height="62dp"
        android:text="SUB"
        android:textSize="16sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.353"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.656" />

    <Button
        android:id="@+id/butDiv"
        android:layout_width="89dp"
        android:layout_height="62dp"
        android:text="DIV"
        android:textSize="16sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.96"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.656" />

    <EditText
        android:id="@+id/txtResult1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="text"
        android:textColor="#FF5722"
        app:layout_constraintBottom_toBottomOf="parent"
```



```
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.771"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />

<EditText
    android:id="@+id/txtNum2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    android:textColor="#3F51B5"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.766"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.37" />

<TextView
    android:id="@+id/textView5"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Result:"
    android:textAlignment="center"
    android:textColor="#FF5722"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.191"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

<TextView
    android:id="@+id/textView3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Enter Num2:"
    android:textAlignment="center"
    android:textColor="#3F51B5"
    android:textSize="20sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.11"
    app:layout_constraintStart_toStartOf="parent"
```

```
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.372" />

<TextView
    android:id="@+id/textView"
    android:layout_width="255dp"
    android:layout_height="38dp"
    android:text="SIMPLE CALCULATOR"
    android:textAlignment="center"
    android:textColor="#9C27B0"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.103" />

<TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Enter Num1:"
    android:textAlignment="center"
    android:textColor="#3F51B5"
    android:textSize="20sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.11"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.241" />

<EditText
    android:id="@+id/txtNum1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    android:textColor="#673AB7"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.761"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.233" />
```

```
<Button
    android:id="@+id/butAdd"
    android:layout_width="89dp"
    android:layout_height="62dp"
    android:text="ADD"
    android:textSize="16sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.043"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.658" />

<Button
    android:id="@+id/butMul"
    android:layout_width="89dp"
    android:layout_height="62dp"
    android:text="MUL"
    android:textSize="16sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.666"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.656" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

Main activity.java

```
package com.girish.simplecalculator;

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 implements
View.OnClickListener {
    Button but_Add, but_Sub, but_Mul, but_Div;
```

```
EditText txt_Num1,txt_Num2;
TextView txt_Res;

@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    but_Add = (Button) findViewById(R.id.butAdd);
    but_Sub = (Button) findViewById(R.id.butSub);
    but_Mul = (Button) findViewById(R.id.butMul);
    but_Div = (Button) findViewById(R.id.butDiv);

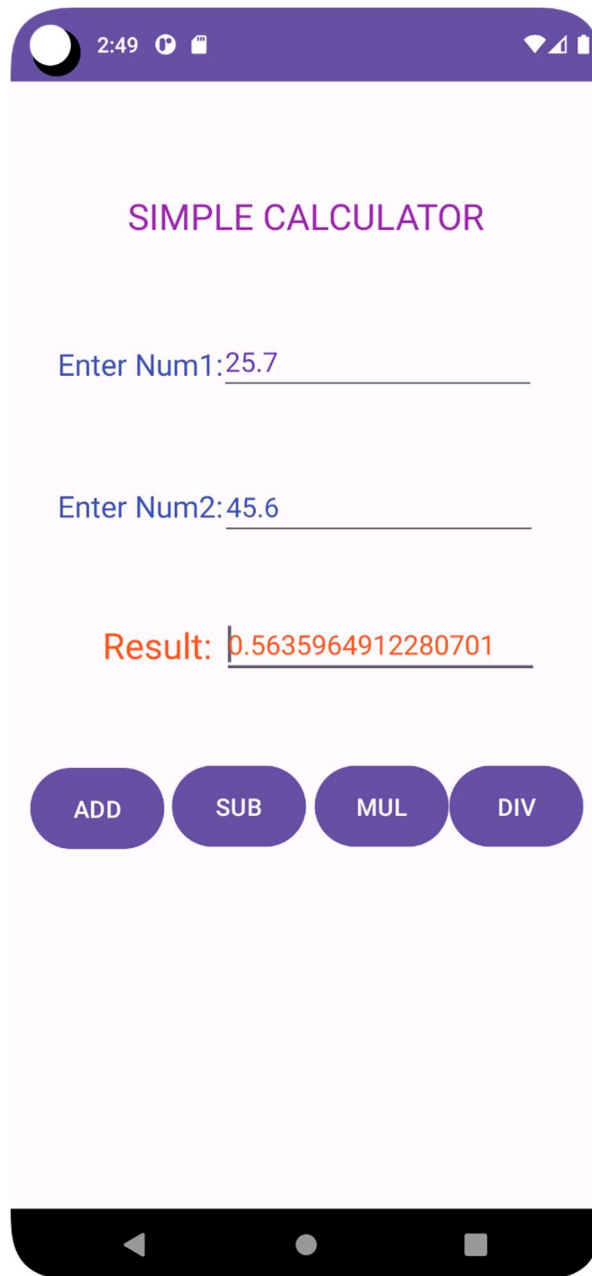
    txt_Num1 = (EditText) findViewById(R.id.txtNum1);
    txt_Num2 = (EditText) findViewById(R.id.txtNum2);

    txt_Res = (TextView) findViewById(R.id.txtResult1);

    but_Add.setOnClickListener(this);
    but_Sub.setOnClickListener(this);
    but_Mul.setOnClickListener(this);
    but_Div.setOnClickListener(this);
}
@Override
public void onClick(View v) {
    double op1 =
Double.parseDouble(txt_Num1.getText().toString());
    double op2 =
Double.parseDouble(txt_Num2.getText().toString());
    double Res;

    if(v.equals(but_Add))
        Res = op1 + op2;
    else if(v.equals(but_Sub))
        Res = op1 - op2;
    else if(v.equals(but_Mul))
        Res = op1 * op2;
    else if(v.equals(but_Div))
        Res = op1 / op2;
    else Res = 0;
    txt_Res.setText(String.valueOf(Res));
}
}
```

Output



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 sign up 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.

The image shows two wireframe layouts for an Android application. The left wireframe is titled 'SIGNUP ACTIVITY' and contains two text input fields labeled 'Username:' and 'Password:', followed by a 'SIGN UP' button. The right wireframe is titled 'LOGIN ACTIVITY' and contains two text input fields labeled 'Username:' and 'Password:', followed by a 'SIGN IN' button. Both wireframes are set against a light gray grid background.

1. Create a New Android Project with Empty Activity.
2. Open activity_main.xml file from res → layout folder, check/add Constraint Layout as the root view.
3. Create Signup Layout using Drag and Drop framework design the layout.
4. Create One more Empty Activity LoginActivity using Android Studio Create Activity Flow (Refer Android Studio Tutorial)
5. Open activity_login.xml file from res → layout folder, check/add Constraint Layout as the root view.
6. Create Login Layout using Drag and Drop framework.
7. Add Listeners to Button Click Event:
 - Create a class which implements OnClickListener interface.
 - Override onClick() method of OnClickListener Interface.
 - Register the button for click event by calling setOnClickListener() method of View class and pass the object of the class that implemented OnClickListener Interface.

8. Use Regular Expression "`^(?=.*[A-Z])(?=.*[a-z])(?=.*\d)(?=.*[@$!]) [A-Za-z\d@$!]{8,}$`" to validate the password.

Design

The image shows two side-by-side wireframe designs for a mobile application. The left design is a sign-up screen with a 'SIGN UP' button at the top, followed by input fields for 'USERNAME' and 'PASSWORD', and a 'SIGN UP' button at the bottom. The right design is a login screen with a 'Login' button at the top, followed by input fields for 'USERNAME' and 'PASSWORD', and a 'LOGIN' button at the bottom. Both screens have a light blue background and a white border.

login.xml

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

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Password:"
        android:textAllCaps="true"
        android:textColor="#3949AB"
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.1"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.423" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="LOGIN ACTIVITY"
        android:textAlignment="center"
        android:textColor="#8E24AA"
        android:textSize="34sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.074" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="User Name:"
```



```
android:textAllCaps="true"
android:textColor="#3949AB"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.102"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.271" />

<EditText
    android:id="@+id/txt_login_username"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.905"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.256" />

<EditText
    android:id="@+id/txt_login_password"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.91"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.412" />

<Button
    android:id="@+id/btn_login_signup"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:background="#1E88E5"
    android:backgroundTint="#1E88E5"
    android:text="Sign In"
    android:textColorLink="#1E88E5"
    app:layout_constraintBottom_toBottomOf="parent"
```

```
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.423"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.628" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Login.java

```
package com.girish.signup;

import androidx.appcompat.app.AppCompatActivity;

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

public class Login extends AppCompatActivity implements
View.OnClickListener {

    EditText txtLoginUsername,txtLoginPassword;
    Button btnLogin;

    String user,pass;
    int count = 0;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_login);

        txtLoginUsername = (EditText)
findViewById(R.id.txt_login_username);
        txtLoginPassword = (EditText)
findViewById(R.id.txt_login_password);
        btnLogin = (Button) findViewById(R.id.btn_login_signup);
        btnLogin.setOnClickListener(this);

        Bundle bundle = getIntent().getBundleExtra("data");
        user = bundle.getString("user");
        pass = bundle.getString("pass");

    }
```

```
@Override
public void onClick(View v) {
    String user1 = txtLoginUsername.getText().toString();
    String pass1 = txtLoginPassword.getText().toString();

    if (user.equals(user1) && pass.equals(pass1)) {
        Toast.makeText(this, "Login
Successful", Toast.LENGTH_LONG).show();
    }
    else {
        count++;
        if (count == 3)
        {
            btnLogin.setEnabled(false);
            Toast.makeText(this, "Failed Login
Attempts", Toast.LENGTH_LONG).show();
        }
        else {
            Toast.makeText(this, "Login
Failed"+count, Toast.LENGTH_LONG).show();
        }
    }

}
}
```

main activity.xml

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

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Password:"
        android:textAllCaps="true"
        android:textColor="#3949AB"
```

```
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.1"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.423" />
```

```
<TextView
    android:id="@+id/textView"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="SIGN UP ACTIVITY"
    android:textAlignment="center"
    android:textColor="#8E24AA"
    android:textSize="34sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.074" />
```

```
<TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="User Name:"
    android:textAllCaps="true"
    android:textColor="#3949AB"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.102"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.271" />
```

```
<EditText
    android:id="@+id/txt_login_username"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
```

```
app:layout_constraintHorizontal_bias="0.92"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.256" />

<EditText
    android:id="@+id/txt_login_password"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.91"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.412" />

<Button
    android:id="@+id/btn_login_signup"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:background="#1E88E5"
    android:backgroundTint="#1E88E5"
    android:text="Sign Up"
    android:textColorLink="#1E88E5"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.423"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.628" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.girish.signup;

import androidx.appcompat.app.AppCompatActivity;

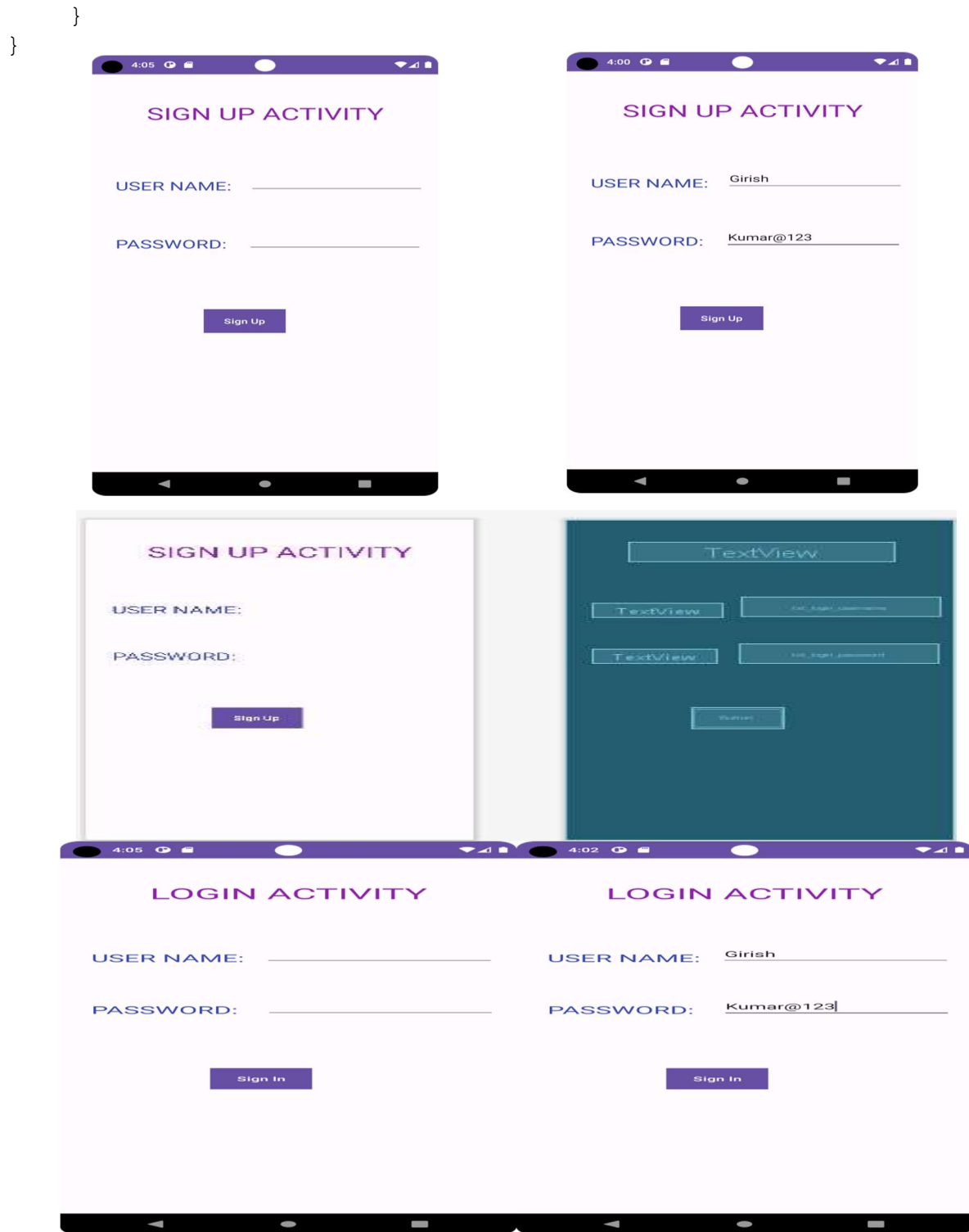
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
```

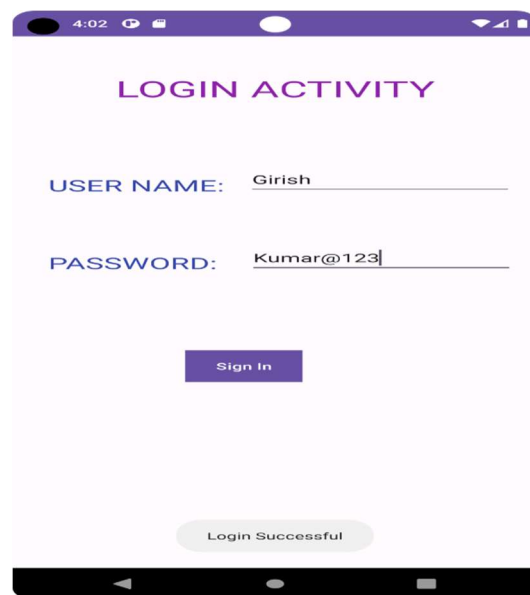
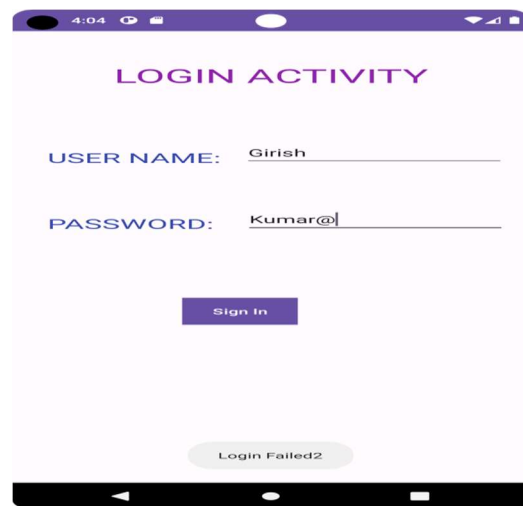
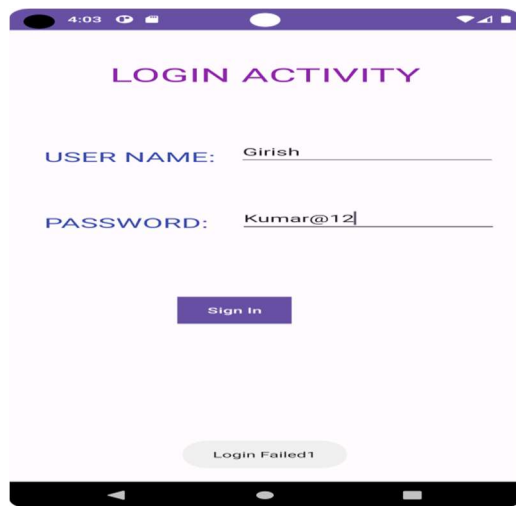
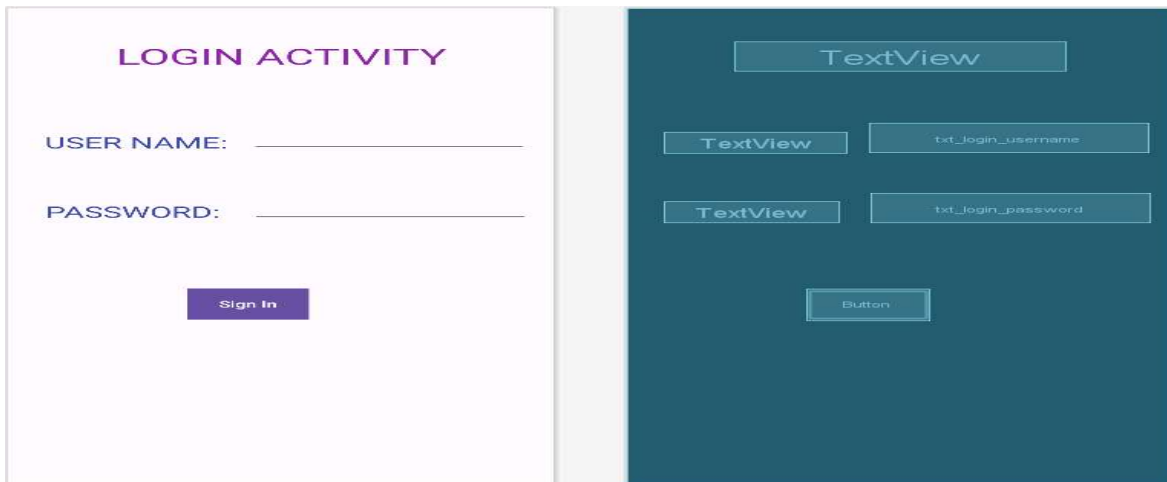
```
import android.widget.EditText;
import android.widget.Toast;

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

public class MainActivity extends AppCompatActivity implements
View.OnClickListener {
    EditText txtUsername;
    EditText txtPassword;
    Button btnSignup;
    String regularExpression = "^(?=.*[A-Z])(?=.*[a-
z])(?=.*\\d)(?=.*[@$!]) [A-Za-z\\d@$!]{8,}$";

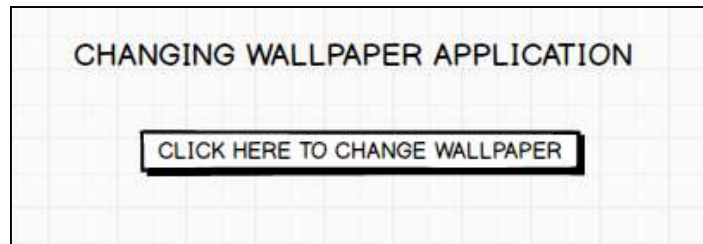
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        txtUsername = (EditText)
findViewById(R.id.txt_login_username);
        txtPassword = (EditText)
findViewById(R.id.txt_login_password);
        btnSignup = (Button)
findViewById(R.id.btn_login_signup);
        btnSignup.setOnClickListener(this);
    }
    public void onClick(View v) {
        String username = txtUsername.getText().toString();
        String password = txtPassword.getText().toString();
        if (validatePassword(password)) {
            Bundle bundle = new Bundle();
            bundle.putString("user", username);
            bundle.putString("pass", password);
            Intent it = new Intent(this, Login.class);
            it.putExtra("data", bundle);
            startActivity(it);
        } else {
            Toast.makeText(getApplicationContext(), "Invalid Password",
Toast.LENGTH_LONG).show();
        }
    }
    private boolean validatePassword(String password) {
        Pattern pattern = Pattern.compile(regularExpression);
        Matcher matcher = pattern.matcher(password);
        return matcher.matches();
    }
}
```





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. Create a New Android Project with Empty Activity.
2. Open activity_main.xml file from res → layout folder, check/add LinearLayout as the root view.
3. Create the layout
4. Add 3 or More images to drawable folder (res → drawable)
5. Declare uses permission android.permission.SET_WALLPAPER in the AndroidManifest.xml file
6. Schedule Timer task to change the wallpaper on every 30 seconds interval.
7. Initialize and use WallpaperManager.setBitmap() method to change the wallpaper.

activity_main.xml

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

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="changing wall paper"
        android:textAlignment="center"
        android:textAllCaps="true"
        android:textColor="#8E24AA"
        android:textSize="34sp"
        app:layout_constraintBottom_toBottomOf="parent"
```

```
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.516"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.096" />

<Button
    android:id="@+id/btn_wall"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="click here for changing wallpaper"
    android:textAllCaps="true"
    android:textSize="20sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.494"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.349" />

</androidx.constraintlayout.widget.ConstraintLayout>
mainActivity.java

package com.girish.wallpaper;

import androidx.appcompat.app.AppCompatActivity;

import android.app.WallpaperManager;
import android.graphics.BitmapFactory;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

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

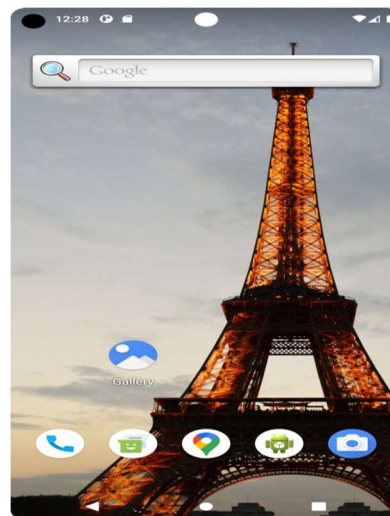
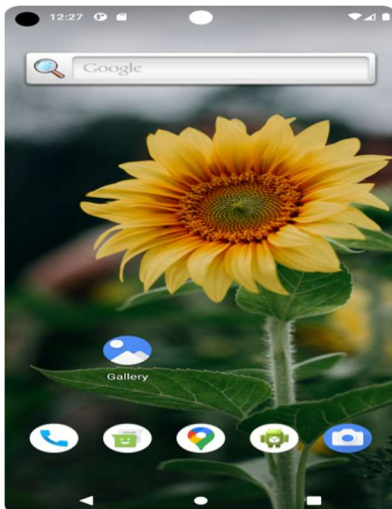
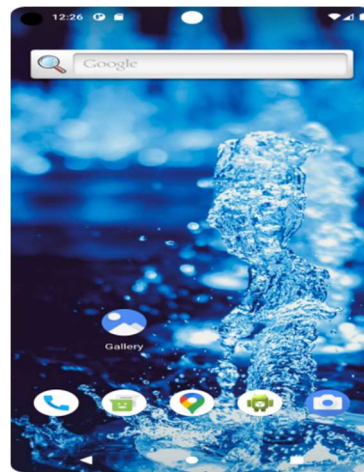
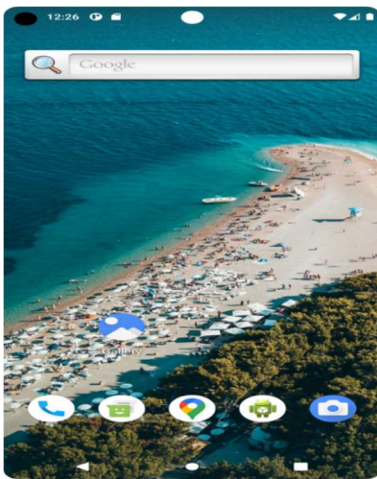
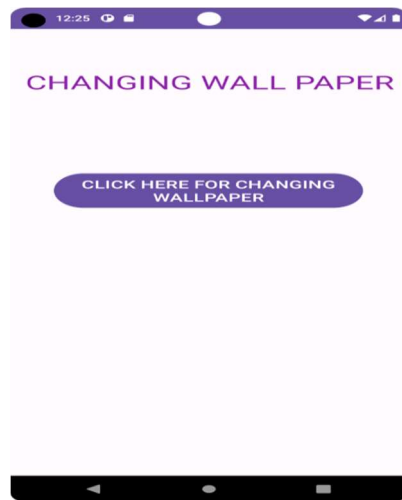
public class MainActivity extends AppCompatActivity implements
View.OnClickListener {

    Button btn;
    boolean running;
    int[] ia = new int[] {
```

```
R.drawable.img1,R.drawable.img2,R.drawable.img3,R.drawable.img4,  
R.drawable.img5};
```

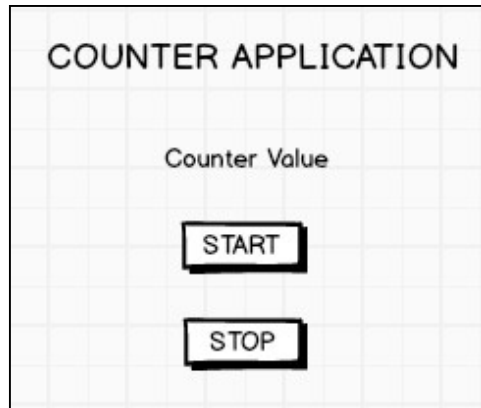
```
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_main);  
        btn = (Button) findViewById(R.id.btn_wall);  
        btn.setOnClickListener(this);  
    }  
  
    @Override  
    public void onClick(View v) {  
        if(!running){  
            new Timer().schedule(new MyTimer(),0,1000);  
            running = true;  
        }  
    }  
  
    private class MyTimer extends TimerTask {  
  
        @Override  
        public void run() {  
            try{  
                WallpaperManager wallpaperManager =  
WallpaperManager.getInstance(getApplicationContext());  
                Random random = new Random();  
  
wallpaperManager.setBitmap(BitmapFactory.decodeResource(getResou  
rces(),ia[random.nextInt(5)]));  
            } catch (IOException e) {  
  
            }  
        }  
    }  
}
```

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. Create a New Android Project with Empty Activity.
2. Open activity_main.xml file from res→layout folder, check/add ConstraintLayout as the root view.
3. Create the layout design using Drag and Drop framework.
4. Add Listeners to Button Click Event:
 - Create a class which implements OnClickListener interface.
 - Override onClick() method of OnClickListener Interface.
 - Register the button for click event by calling setOnClickListener() method of View class and pass the object of the class that implemented OnClickListener Interface.
5. Create a Thread to start the counter logic.
6. Steps to Create a Thread
 - Create a class that extends Thread Class.
 - Override run method of Thread Class.
 - Use start() method of thread class to start the thread.
7. Create Handler class to receive message from child thread, Handler executes in MainThread.
8. Steps to Create Handler
 - Create Object of type Handler.
 - OverridhandleMessage() of handler class.
9. Pass the counter value to be displayed to the handler.

10. Update the UI to display the counter value received from thread.

Design



activity_main.xml

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

    <Button
        android:id="@+id/btn_stop"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:background="#C0CA33"
        android:backgroundTint="#7CB342"
```

```
        android:text="Stop"
        android:textAlignment="center"
        android:textAllCaps="true"
        android:textColor="#D81B60"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.463"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.623" />

<TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="counter application"
    android:textAlignment="center"
    android:textAllCaps="true"
    android:textColor="#5E35B1"
    android:textSize="34sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.434"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.161" />

<TextView
    android:id="@+id/lbl_text"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Counter Value"
    android:textAlignment="center"
    android:textAllCaps="false"
    android:textColor="#D81B60"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.313" />

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

```
android:layout_height="wrap_content"
android:background="#C0CA33"
android:backgroundTint="#7CB342"
android:text="Start"
android:textAlignment="center"
android:textAllCaps="true"
android:textColor="#D81B60"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.463"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.474" />
```

```
</androidx.constraintlayout.widget.ConstraintLayout>
```

mainActivity.java

```
package com.girish.counterapplication;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity implements
View.OnClickListener {
    TextView lblCounter;
    Button btnStart,btnStop;
    int counter = 0;
    boolean running = false;

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

        lblCounter = (TextView) findViewById(R.id.lbl_text);
        btnStart = (Button) findViewById(R.id.btn_start);
        btnStop = (Button) findViewById(R.id.btn_stop);
        btnStart.setOnClickListener(this);
```



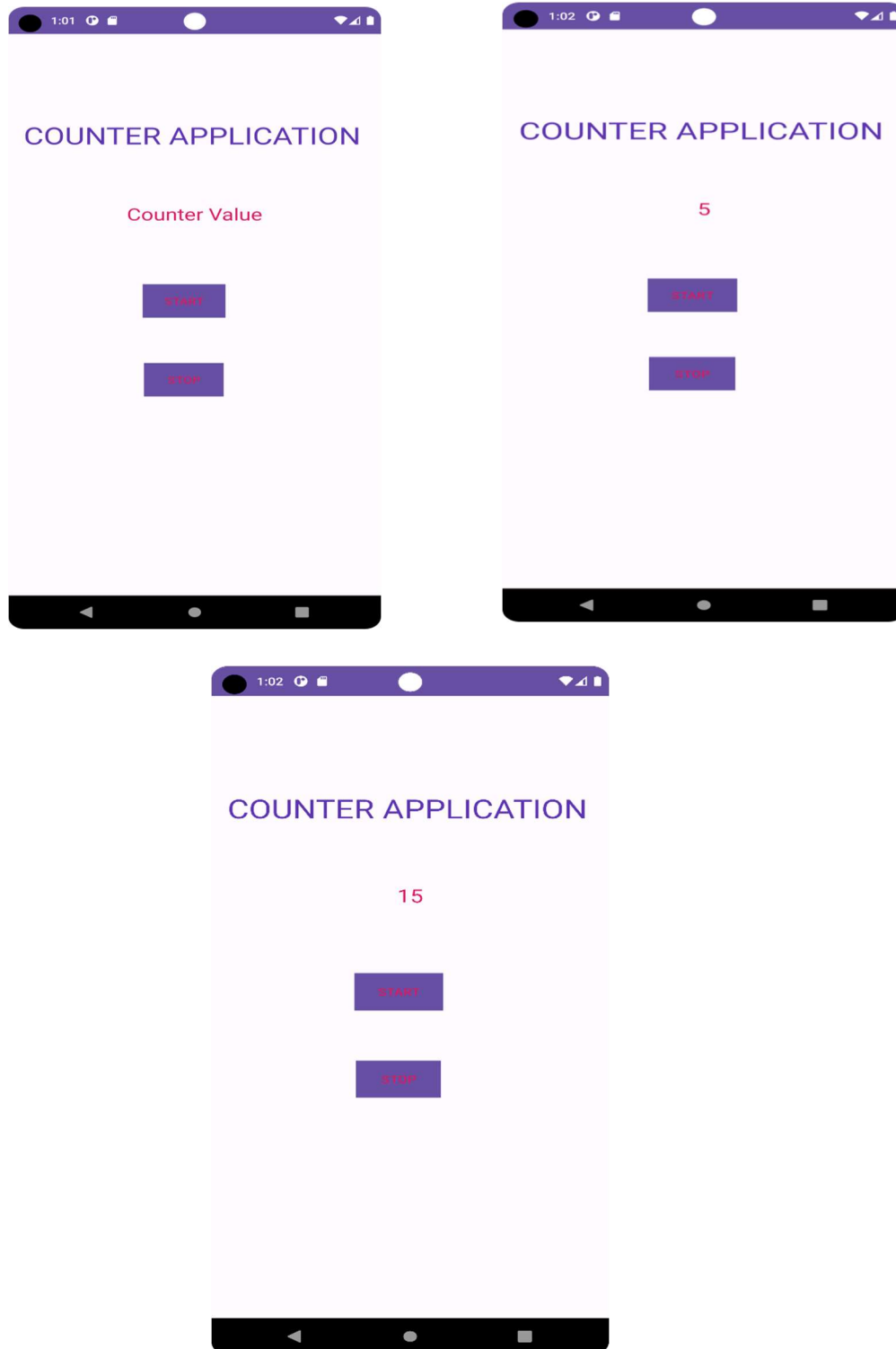
```
        btnStop.setOnClickListener(this);
    }

    @Override
    public void onClick(View v) {
        if(v.equals(btnStart)){
            counter = 0;
            running = true;
            new MyCounter().start();
        } else if (v.equals(btnStop)) {
            running = false;
        }
    }

    Handler handler = new Handler()
    {
        public void handleMessage(Message m)
        {
            lblCounter.setText(String.valueOf(m.what));
        }
    };

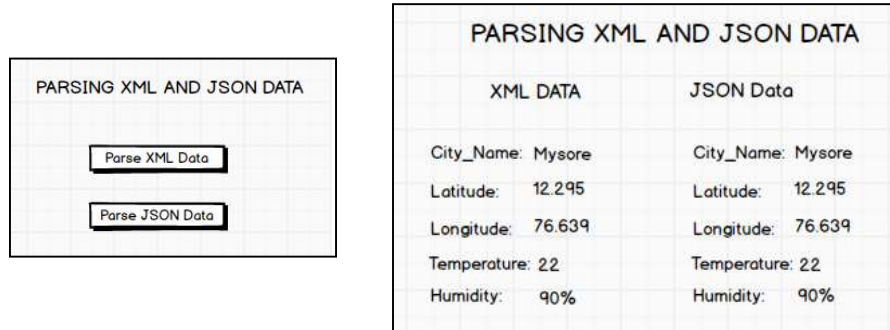
    class MyCounter extends Thread{
        public void run(){
            while(running){
                counter++;
                handler.sendMessage(counter);
                try{
                    Thread.sleep(1000);
                }
                catch (Exception e){ }
            }
        }
    }
}
```

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. Create a New Android Project with Empty Activity.
2. Open activity_main.xml file from res → layout folder, check/add ConstraintLayout as the root view.
3. Create the layout design using Drag and Drop framework.
4. Add Listeners to Button Click Event:
 - Create a class which implements OnClickListener interface.
 - Override onClick() method of OnClickListener Interface.
 - Register the button for click event by calling setOnClickListener() method of Viewclass and pass the object of the class that implemented OnClickListener Interface.
5. Create assets folder (Refer Section Android Studio Tutorial)
6. Create **input.json** file inside assets folder and paste the below Json Data

input.json

```
{
  "weather": {
    "city_name": "Ballari",
    "Latitude": "12.295",
    "Longitude": "76.639",
    "Temperature": "22",
    "Humidity": "90%"
  }
}
```

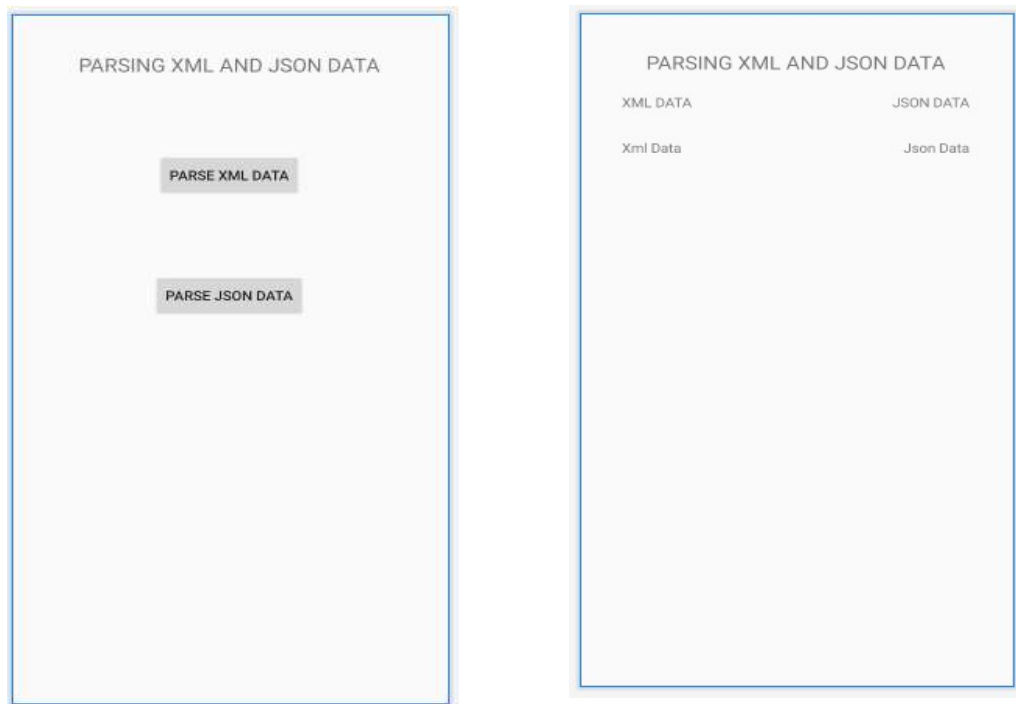
7. Create **input.xml** file inside assets folder and paste the below Xml Data

input.xml

```
<?xml version="1.0" ?>
<records>
  <weather>
    <city_name>Ballari</city_name>
    <Latitude>12.295</Latitude>
    <Longitude>76.639</Longitude>
    <Temperature>22</Temperature>
    <Humidity>90%</Humidity>
  </weather>
</records>
```

8. Read the XML and Json Data in the files and display on screen

Design



activity_main.xml

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

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="PARSE XML AND JSON DATA"
        android:textColor="#3949AB"
        android:textSize="30sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.405"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.119" />

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="XML DATA"
        android:textColor="#8E24AA"
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.117"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.288" />

    <TextView
        android:id="@+id/textView4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="JSON DATA"
        android:textColor="#8E24AA"
```

```
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.882"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.287" />

<TextView
    android:id="@+id/lbl_xml_data"
    android:layout_width="160dp"
    android:layout_height="348dp"
    android:text="xml data"
    android:textColor="#D81B60"
    android:textSize="16sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.076"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.78" />

<TextView
    android:id="@+id/lbl_json_data"
    android:layout_width="171dp"
    android:layout_height="378dp"
    android:text="json data"
    android:textColor="#D81B60"
    android:textSize="20sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.862"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.847" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

ViewAcitivity.java

```
package com.girish.parsingxmljson;
import androidx.appcompat.app.AppCompatActivity;
import android.annotation.SuppressLint;
import android.os.Bundle;
import android.widget.TextView;
```

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

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

public class ViewActivity extends AppCompatActivity {

    TextView lblXmlData, lblJsonData;
    int mode = 0;
    @SuppressWarnings("MissingInflatedId")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_view);

        lblXmlData = (TextView) findViewById(R.id.lbl_xml_data);
        lblJsonData = (TextView)
findViewById(R.id.lbl_json_data);

        mode = getIntent().getIntExtra("mode", 0);
        if(mode == 1)
            parseJson();
        else
            parseXml();

    }

    private void parseXml() {
        try{
            InputStream is = getAssets().open("input.xml");
            DocumentBuilderFactory db =
DocumentBuilderFactory.newInstance();
            DocumentBuilder b = db.newDocumentBuilder();
            Document doc = b.parse(is);
            Element e = doc.getDocumentElement();
            e.normalize();
```

```
        NodeList list = doc.getElementsByTagName("weather");
        for(int i = 0; i<list.getLength();i++){
            Node n = list.item(i);
            if(n.getNodeType() == Node.ELEMENT_NODE){
                Element e1 = (Element)n;
                lblXmlData.setText("City
Name:"+getValue("city_name", e1)+"\n");

                lblXmlData.append("Latitude:"+getValue("Latitude",e1)+"\n");

                lblXmlData.append("Longitude:"+getValue("Longitude",e1)+"\n");

                lblXmlData.append("Temperature:"+getValue("Temperature",e1)+"\n"
);

                lblXmlData.append("Humidity:"+getValue("Humidity",e1)+"\n");

            }
        }
    } catch (Exception e){
        e.printStackTrace();
    }

}

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

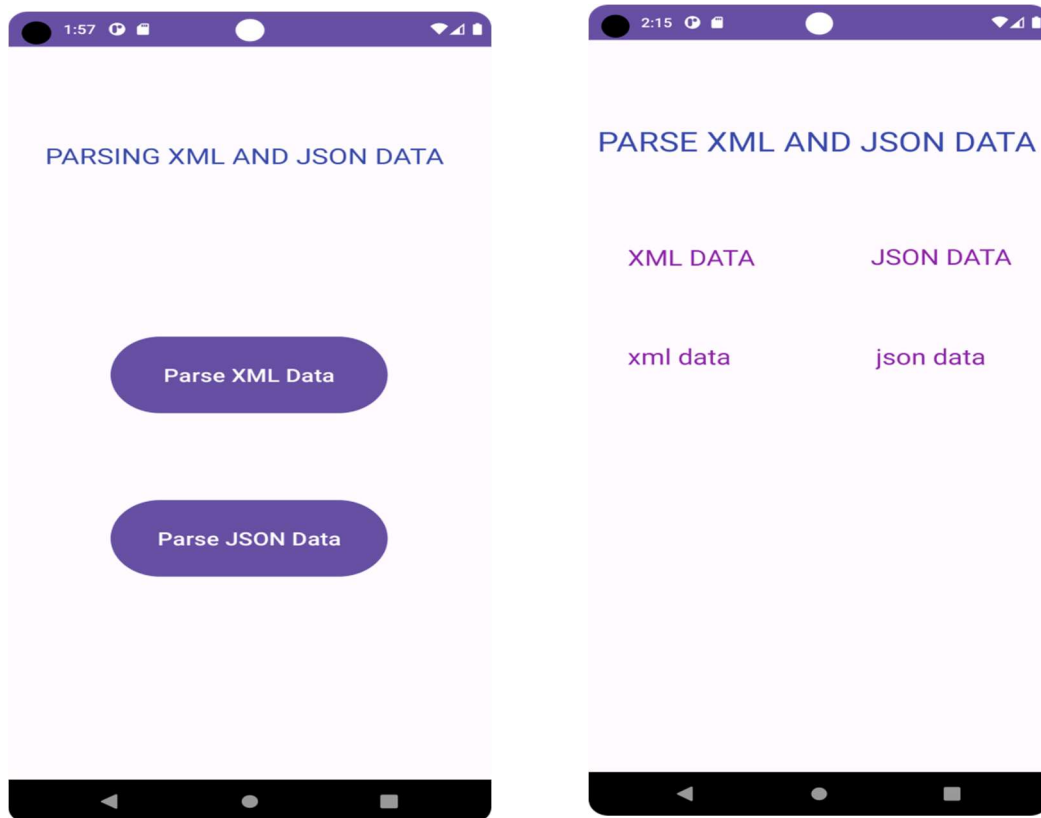
private void parseJson() {
    try {
        InputStream ip = getAssets().open("input.json");
        byte[] data = new byte[ip.available()];
        ip.read(data);

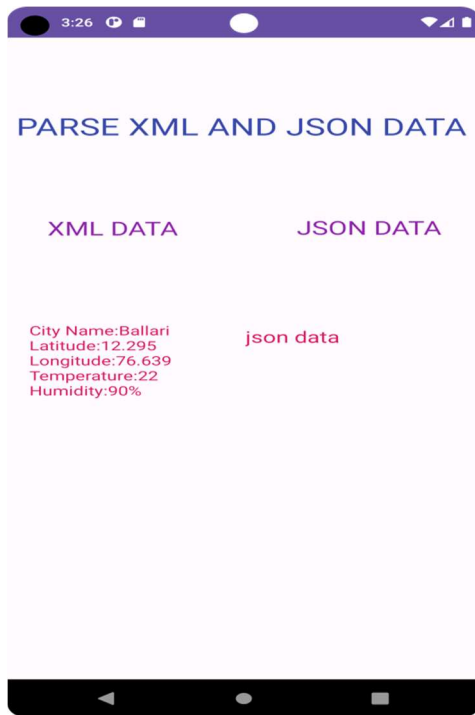
        String readData = new String(data);
        JSONObject jo = new JSONObject(readData);
        JSONObject jo1 = jo.getJSONObject("weather");
        lblJsonData.setText("city_name:" +
jo1.getString("city_name") + "\n");
    }
}
```



```
        lblJsonData.append("Latitude:" +
jol.getString("Latitude") + "\n");
        lblJsonData.append("Longitude:" +
jol.getString("Longitude") + "\n");
        lblJsonData.append("Temperature:" +
jol.getString("Temperature") + "\n");
        lblJsonData.append("Humidity:" +
jol.getString("Humidity") + "\n");
    } catch (JSONException ex) {
        throw new RuntimeException(ex);
    } catch (IOException ex) {
        throw new RuntimeException(ex);
    }
}
}
```

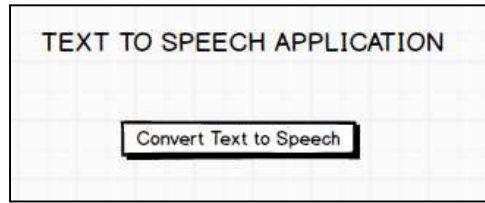
Output





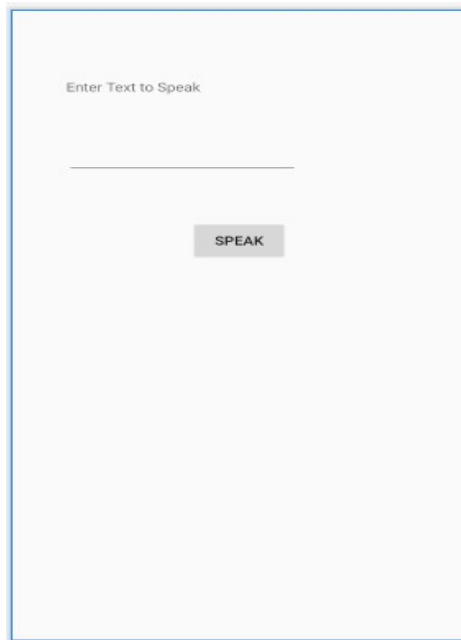
Program 7

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. Create a New Android Project with Empty Activity.
2. Open activity_main.xml file from res→ layout folder, check/add ConstraintLayout as the root view.
3. Create the layout design using Drag and Drop framework.
4. Add Listeners to Button Click Event:
 - Create a class which implements OnClickListener interface.
 - Override onClick() method of OnClickListener Interface.
 - Register the button for click event by calling setOnClickListener() method of Viewclass and pass the object of the class that implemented OnClickListener Interface.
5. Initialize TextToSpeech Engine and the Language to Speak using setLanguage() method
6. Use Speak() method to speak the text passed to it.

Design



activity_main.xml

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

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="TEXT TO SPEECH APPLICATION"
        android:textColor="#5E35B1"
        android:textSize="28sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.132" />

    <Button
        android:id="@+id/btn_speak"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Convert Text to Speech"
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.495"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.568" />

    <EditText
        android:id="@+id/editText"
        android:layout_width="317dp"
        android:layout_height="60dp"
        android:ems="10"
        android:inputType="text"
```

```
android:text="Type Here"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.343"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.332" />
```

```
</androidx.constraintlayout.widget.ConstraintLayout>
```

main activity.java

```
package com.girish.texttospeech;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.speech.tts.TextToSpeech;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

import java.util.Locale;

public class MainActivity extends AppCompatActivity implements
View.OnClickListener, TextToSpeech.OnInitListener {
    EditText txt;
    Button btnSp;
    TextToSpeech txtSp;

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

        txt = (EditText) findViewById(R.id.editText);
        btnSp = (Button) findViewById(R.id.btn_speak);

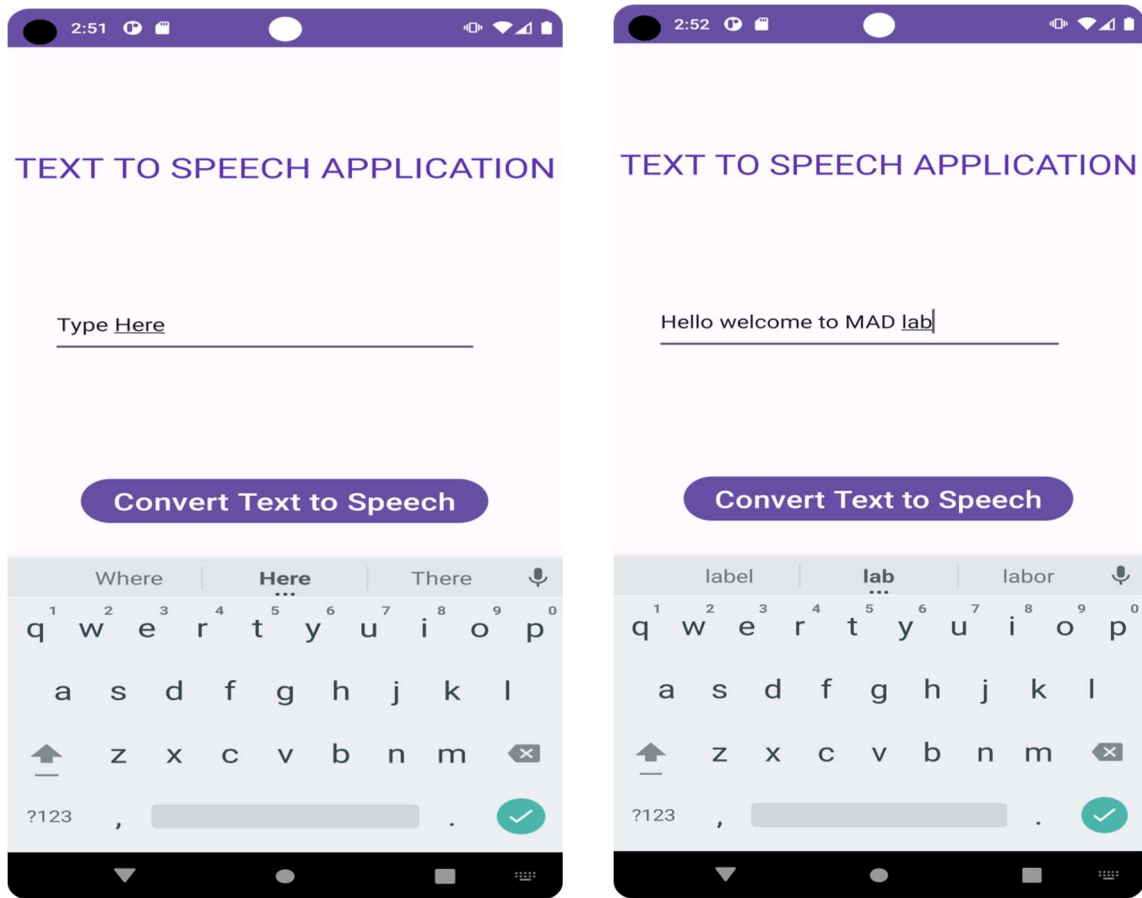
        btnSp.setOnClickListener(this);
        txtSp = new TextToSpeech(getApplicationContext(), this);
        txtSp.setLanguage(Locale.UK);
    }
}
```

```
@Override
public void onClick(View v) {
    String text = txt.getText().toString();
    txtSp.speak(text, TextToSpeech.QUEUE_FLUSH, null);
}

@Override
public void onInit(int status) {
    if(status!= TextToSpeech.ERROR){

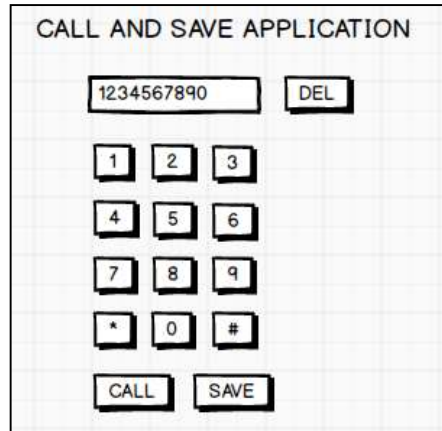
        Toast.makeText(getApplicationContext(), "Success", Toast.LENGTH_LONG).show();
    }
}
}
```

Output



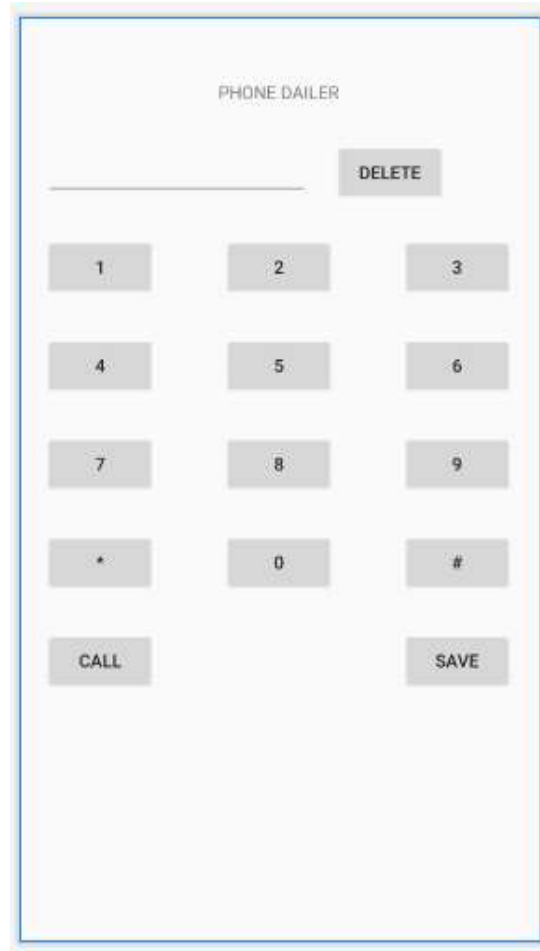
Program 8

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. Create a New Android Project with Empty Activity.
2. Open activity_main.xml file from res→layout folder, check/add ConstraintLayout as the root view.
3. Create the layout design using Drag and Drop framework.
4. Add Listeners to Button Click Event:
 - Create a class which implements OnClickListener interface.
 - Override onClick() method of OnClickListener Interface.
 - Register the button for click event by calling setOnClickListener() method of View class and pass the object of the class that implemented OnClickListener Interface.
5. Declare uses permission android.permission.CALL_PHONE in the manifest file.
6. Use ACTION_CALL intent name and pass the "tel:<phone-number>" as URI in intentdata and start the call activity.
7. Use intent name and pass the "Telephone Number" and "unknown" as name as intentdata call Contacts Save Activity.

Design



activity main.xml

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

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



```
android:layout_height="wrap_content"
android:text="CALL"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.273"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.927" />
```

<Button

```
android:id="@+id/btn_save"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="SAVE"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.654"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.928" />
```

<Button

```
android:id="@+id/btn_four"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="4"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.123"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.521" />
```

<Button

```
android:id="@+id/btn_eight"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="8"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
```

```
app:layout_constraintHorizontal_bias="0.461"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.662" />
```

```
<Button
    android:id="@+id/btn_seven"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="7"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.105"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.662" />
```

```
<Button
    android:id="@+id/btn_zero"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="0"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.461"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.804" />
```

```
<Button
    android:id="@+id/btn_star"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="*"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.145"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.804" />
```

```
<Button
```

```
android:id="@+id/btn_hash"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="#"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.814"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.804" />
```

<Button

```
android:id="@+id/btn_nine"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="9"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.814"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.662" />
```

<Button

```
android:id="@+id/btn_five"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="5"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.439"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.521" />
```

<Button

```
android:id="@+id/btn_six"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="6"
android:textSize="24sp"
```

```
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.792"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.521" />
```

```
<Button
    android:id="@+id/btn_three"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="3"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.792"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.39" />
```

```
<Button
    android:id="@+id/btn_one"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="1"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.125"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.39" />
```

```
<Button
    android:id="@+id/btn_two"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="2"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.461"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.39" />
```

```
<TextView
    android:id="@+id/textView"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="CALL AND SAVE APPLICATION"
    android:textAlignment="center"
    android:textColor="#5E35B1"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.097" />

<Button
    android:id="@+id/btn_delete"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="DEL"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.915"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.259" />

<EditText
    android:id="@+id/txt_phonenumber"
    android:layout_width="269dp"
    android:layout_height="67dp"
    android:ems="10"
    android:inputType="phone"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.236"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.236" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.girish.cs;
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;

public class MainActivity extends AppCompatActivity implements
View.OnClickListener {

    Button btnOne, btnTwo, btnThree, btnFour, btnFive, btnSix,
    btnSeven, btnEight, btnNine, btnZero;
    Button btnSave, btnDel, btnStar, btnHash, btnCall;
    EditText txtPhone;

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

        btnOne = (Button) findViewById(R.id.btn_one);
        btnOne.setOnClickListener(this);

        btnTwo = (Button) findViewById(R.id.btn_two);
        btnTwo.setOnClickListener(this);

        btnThree = (Button) findViewById(R.id.btn_three);
        btnThree.setOnClickListener(this);

        btnFour = (Button) findViewById(R.id.btn_four);
        btnFour.setOnClickListener(this);

        btnFive = (Button) findViewById(R.id.btn_five);
        btnFive.setOnClickListener(this);

        btnSix = (Button) findViewById(R.id.btn_six);
        btnSix.setOnClickListener(this);

        btnSeven = (Button) findViewById(R.id.btn_seven);
        btnSeven.setOnClickListener(this);
    }
}
```

```
btnEight = (Button) findViewById(R.id.btn_eight);
btnEight.setOnClickListener(this);

btnNine = (Button) findViewById(R.id.btn_nine);
btnNine.setOnClickListener(this);

btnZero = (Button) findViewById(R.id.btn_zero);
btnZero.setOnClickListener(this);

btnSave = (Button) findViewById(R.id.btn_save);
btnSave.setOnClickListener(this);

btnCall = (Button) findViewById(R.id.btn_call);
btnCall.setOnClickListener(this);

btnHash = (Button) findViewById(R.id.btn_hash);
btnHash.setOnClickListener(this);

btnStar = (Button) findViewById(R.id.btn_star);
btnStar.setOnClickListener(this);

btnDel = (Button) findViewById(R.id.btn_delete);
btnDel.setOnClickListener(this);

txtPhone = (EditText)
findViewById(R.id.txt_phonenumber);
txtPhone.setText("");
}

@Override
public void onClick(View v) {
    if (v.equals(btnOne))
        txtPhone.append("1");
    else if (v.equals(btnTwo))
        txtPhone.append("2");
    else if (v.equals(btnThree))
        txtPhone.append("3");
    else if (v.equals(btnFour))
        txtPhone.append("4");
    else if (v.equals(btnFive))
        txtPhone.append("5");
    else if (v.equals(btnSix))
        txtPhone.append("6");
    else if (v.equals(btnSeven))
        txtPhone.append("7");
}
```

```
        else if (v.equals(btnEight))
            txtPhone.append("8");
        else if (v.equals(btnNine))
            txtPhone.append("9");
        else if (v.equals(btnZero))
            txtPhone.append("0");
        else if (v.equals(btnHash))
            txtPhone.append("#");
        else if (v.equals(btnStar))
            txtPhone.append("*");

        else if (v.equals(btnSave)) {
            Intent contactIntent = new
Intent (ContactsContract.Intents.Insert.ACTION);

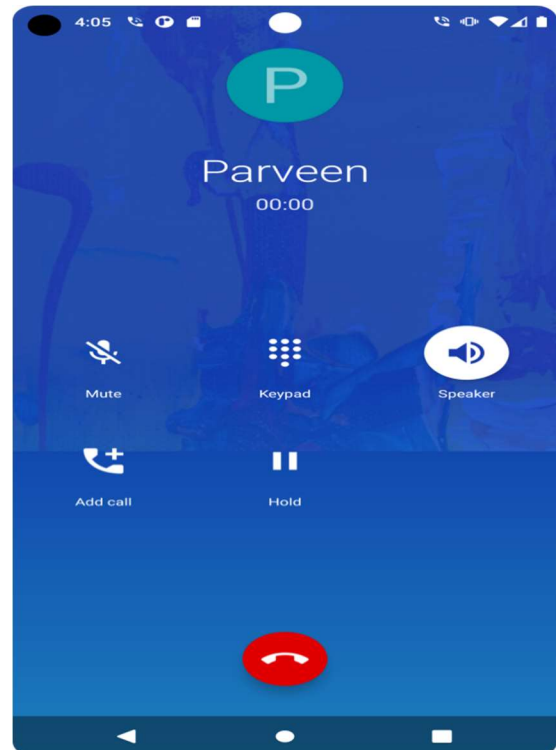
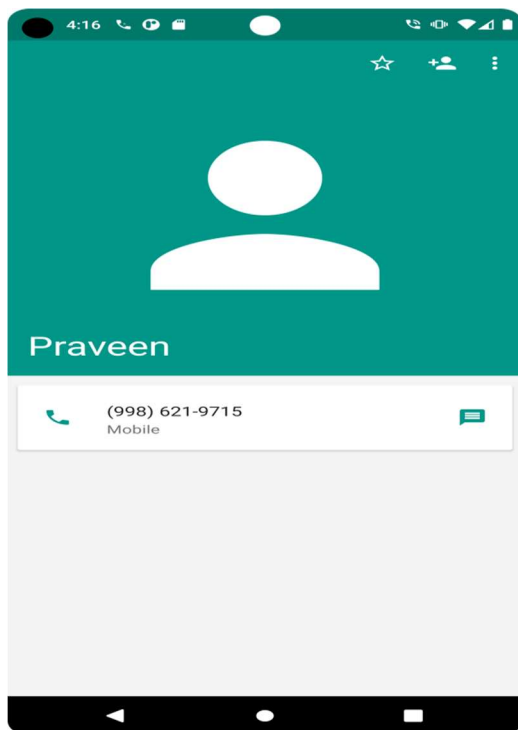
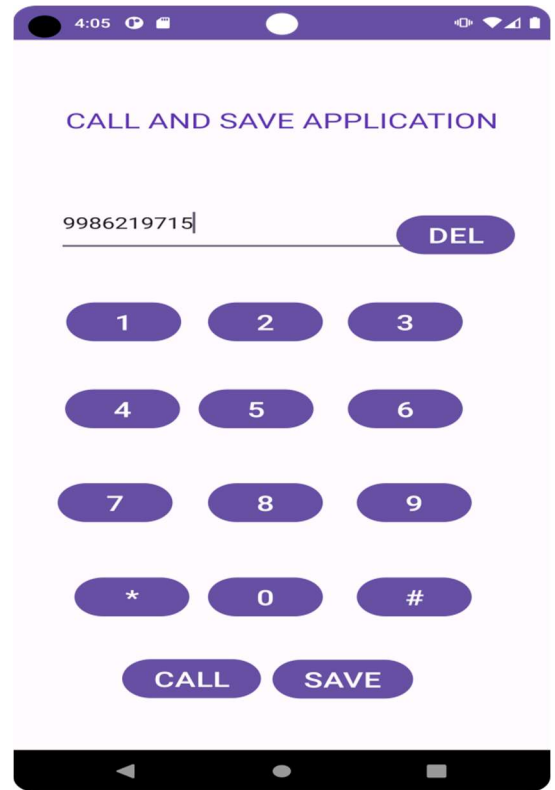
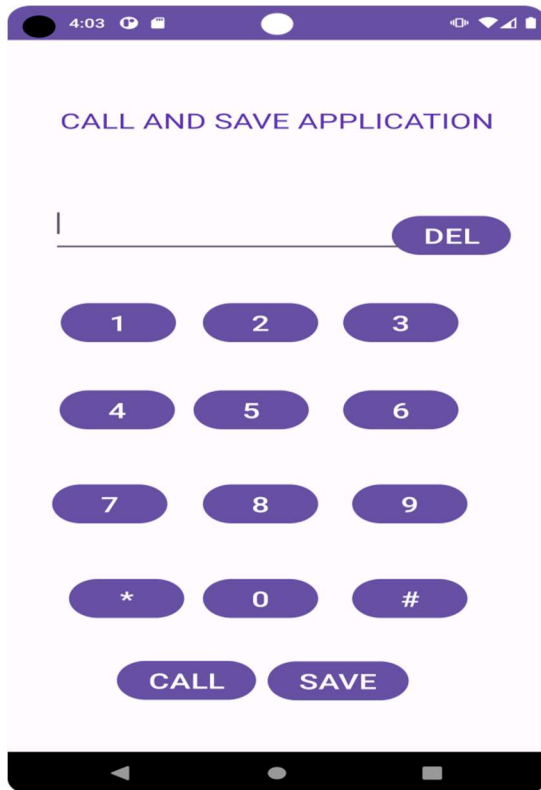
contactIntent.setType (ContactsContract.RawContacts.CONTENT_TYPE)
;

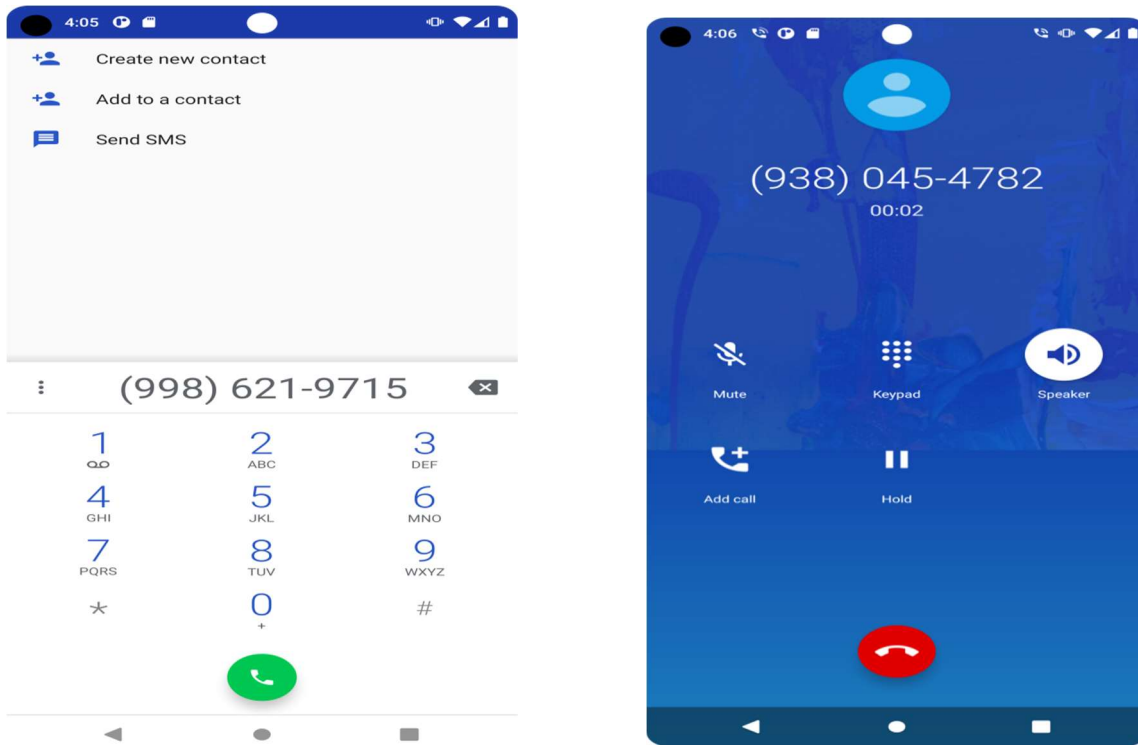
contactIntent.putExtra (ContactsContract.Intents.Insert.NAME,
"Parveen");

contactIntent.putExtra (ContactsContract.Intents.Insert.PHONE,
txtPhone.getText().toString());
            startActivity(contactIntent);
        } else if (v.equals(btnDel)) {
            String data = txtPhone.getText().toString();

            if (data.length() > 0)
                txtPhone.setText(data.substring(0, data.length()
- 1));
            else
                txtPhone.setText("");
        }
        btnCall.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String data = txtPhone.getText().toString();
                Intent i = new Intent(Intent.ACTION_DIAL);
                i.setData(Uri.parse("tel:" + data));
                startActivity(i);
            }
        });
    }
}
```


Output





Reference Books

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4. Bill Phillips, Chris Stewart and Kristin Marsicano, "Android Programming: The Big NerdRanch Guide", 3rd Edition, Big Nerd Ranch Guides, 2017. ISBN-13: 978-0134706054
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