



RAJIV GANDHI
INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Bangalore, Karnataka-560032

“MOBILE APPLICATION DEVELOPMENT LAB MANUAL”

(18CSMP68)

As per VTU Revised Syllabus



ANDROID

PREPARED BY:

Prof. Dr. ANTHONY RAJ A

Associate. Professor, Department of Computer Science & Engineering

R.G.I.T

R.T NAGAR, BANGLORE-32

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) 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: VVCE
 - 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: Nithin Kumar
 - Style: Bold
 - Align center
- 7) Add TextView component change the following properties:
 - Size: 20dp
 - Text: Assistant Professor-CSE
 - Align center
- 8) Add TextView component change the following properties:
 - Size: 20dp
 - Text: Address-Kannada Sahithya Parishath Road, Mysuru-02
 - Align: center
- 9) Add TextView component change the following properties:
 - Size: 20dp
 - Text: Email-nithingowda021@vvce.ac.in
 - Align: center
- 10) Add TextView component change the following properties:
 - Size: 20dp
 - Text: Phone-8050462225

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="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginStart="17dp"
        android:layout_marginLeft="17dp"
        android:layout_marginTop="17dp"
        android:layout_marginEnd="244dp"
        android:layout_marginRight="244dp"
        android:layout_marginBottom="486dp"
        android:text="VVCE"
        android:textSize="38dp" />

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="231dp"
        android:layout_height="174dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="-14dp"
        android:layout_marginRight="-14dp"
        android:layout_marginBottom="481dp"
        app:srcCompat="@drawable/logo" />

    <View
        android:id="@+id/view"
        android:layout_width="wrap_content"
        android:layout_height="4dp"
        android:layout_alignParentBottom="true"
        android:background="#4444"
        android:layout_marginBottom="466dp" />
```

```
<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="117dp"
    android:layout_marginRight="117dp"
    android:layout_marginBottom="394dp"
    android:text="Nithin Kumar"
    android:textSize="30dp"
    android:textStyle="bold" />
```

```
<TextView
    android:id="@+id/textView3"
    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="64dp"
    android:layout_marginRight="64dp"
    android:layout_marginBottom="343dp"
    android:text="Assistant Professor-CSE"
    android:textSize="25dp" />
```

```
<TextView
    android:id="@+id/textView4"
    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="294dp"
    android:text="Ph No: 8050462225"
    android:textSize="20dp" />
```

```
<TextView
    android:id="@+id/textView5"
    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="10dp"
android:layout_marginRight="10dp"
android:layout_marginBottom="229dp"
android:text="Kannada Sahitya Parishath Road Gokulam 3rd Stage Mysuru-02"
android:textSize="20dp" />

```

```

<TextView
    android:id="@+id/textView6"
    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="44dp"
    android:layout_marginRight="44dp"
    android:layout_marginBottom="189dp"
    android:text="Email: nithingowda021@vvce.ac.in"
    android:textSize="20dp" />
</RelativeLayout>

```

JAVA-CODE

```

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
public class MainActivity extends AppCompatActivity {
    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 "SimpleCalci"
- 2) Go to xml code of design change the layout to "RelativeLayout"
- 3) Add TextView component & change the following properties:
 - Size: 38dp
 - Text: Simple Calci
 - Center-Align
- 4) Add PlainText(EditText) component & change the following properties in XML Code:
 - Text: ""
 - Hint: "Enter the first number"
 - id: "@+id/editText1"
- 5) Add PlainText(EditText) component & change the following properties in XML Code:
 - Text: ""
 - Hint: "Enter the second number"
 - 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="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
```

```
android:layout_marginEnd="98dp"
android:layout_marginBottom="653dp"
android:text="SIMPLE CALCI"
android:textSize="38dp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintHorizontal_bias="0.498"
app:layout_constraintLeft_toLeftOf="parent"
app:layout_constraintRight_toRightOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.042" />
```

```
<EditText
    android:id="@+id/editText1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="115dp"
    android:layout_marginBottom="547dp"
    android:ems="10"
    android:hint="Enter the First Number"
    android:inputType="textPersonName"
    android:text="" />
```

```
<EditText
    android:id="@+id/editText2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="111dp"
    android:layout_marginBottom="455dp"
    android:ems="10"
    android:inputType="textPersonName"
    android:hint="Enter the Second Number"
    android:text="" />
```

```
<TextView
    android:id="@+id/textView1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="203dp"
    android:layout_marginBottom="350dp"
    android:text="0"
    android:textSize="40dp" />
```

```
<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="274dp"
android:layout_marginBottom="237dp"
android:onClick="doAdd"
android:text="ADD" />
```

```
<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="68dp"
    android:layout_marginBottom="233dp"
    android:onClick="doSub"
    android:text="SUB" />
```

```
<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="277dp"
    android:layout_marginBottom="115dp"
    android:onClick="doMul"
    android:text="MUL" />
```

```
<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="63dp"
    android:layout_marginBottom="104dp"
    android:onClick="doDiv"
    android:text="DIV" />
```

```
</RelativeLayout>
```

JAVA-CODE:

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

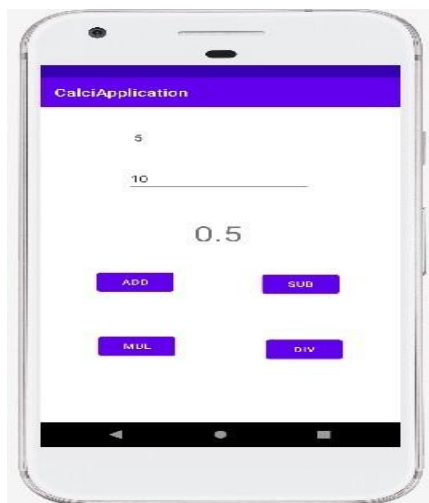


```

public class MainActivity extends AppCompatActivity {
    EditText e1,e2;
    TextView tv1;
    @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);
        tv1 = (TextView)findViewById(R.id.textView1);
    }
    public void doAdd(View V){
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        int result= a1+a2;
        tv1.setText(""+result);
    }
    public void doSub(View V){
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        int result= a1-a2;
        tv1.setText(""+result);
    }
    public void doMul(View V){
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        int result= a1*a2;
        tv1.setText(""+result);
    }
    public void doDiv(View V){
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        float result= a1/a2;
        tv1.setText(""+result);
    }
}

```

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 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 "SignUpActivity"
- 2) Go to xml code of design change the layout to "RelativeLayout"
- 3) Add TextView component & change the following properties:
 - Size: 38dp
 - 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="160dp"
        android:layout_height="42dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="112dp"
```

```
android:layout_marginBottom="573dp"
android:text="Sign Up"
android:textSize="28dp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintLeft_toLeftOf="parent"
app:layout_constraintRight_toRightOf="parent"
app:layout_constraintTop_toTopOf="parent" />
```

```
<EditText
    android:id="@+id/emailEditText"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="29dp"
    android:layout_marginBottom="431dp"
    android:ems="10"
    android:hint="Email ID"
    android:inputType="textEmailAddress"
    android:textSize="28dp" />
```

```
<EditText
    android:id="@+id/passwordEditText"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="34dp"
    android:layout_marginBottom="345dp"
    android:ems="10"
    android:hint="Password"
    android:inputType="textPassword"
    android:textSize="28dp" />
```

```
<Button
    android:id="@+id/signUpBtn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="106dp"
    android:layout_marginBottom="226dp"
    android:text="Sign Up"
    android:textSize="28dp" />
```

```
</RelativeLayout>
```

JAVA-CODE

```
package com.example.loginapplication;

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 emailEditText, passwordEditText;
    Button signUpBtn;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        emailEditText = findViewById(R.id.emailEditText);
        passwordEditText = findViewById(R.id.passwordEditText);
        signUpBtn = findViewById(R.id.signUpBtn);
        signUpBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String email = emailEditText.getText().toString();
                String password = passwordEditText.getText().toString();
                if (!isValidPassword(password)) {
                    Toast.makeText(MainActivity.this, "Password Does not match the rules",
Toast.LENGTH_LONG).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].*$");
    Pattern specialCharacter = Pattern.compile("^[^a-zA-Z0-9].*$");
```

```

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 (!specialCharacter.matcher(password).matches()) {
        return false;
    }
    return true;
}
}

```

- 7) Right click on Java folder-> new-> activity->empty activity-> name it as "LoginActivity"
- 8) Go to xml code of design change the layout to "RelativeLayout"
- 9) Add TextView component & change the following properties:
 - Size: 38dp
 - Text: "Login"
 - Center-Align
- 10) Add Email (EditText) component & change the following properties in XML Code:
 - Hint: "Email ID"
 - id: "@+id/emailEditText"
- 11) Add Password (EditText) component & change the following properties in XML Code:
 - Hint: "Password"
 - id: "@+id/passwordEditText"
- 12) 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/textView"  
    android:layout_width="210dp"  
    android:layout_height="54dp"  
    android:layout_alignParentEnd="true"  
    android:layout_alignParentBottom="true"  
    android:layout_marginEnd="120dp"  
    android:layout_marginBottom="576dp"  
    android:text="Login Activity"  
    android:textSize="28dp" />
```

```
<EditText  
    android:id="@+id/emailEditText"  
    android:layout_width="222dp"  
    android:layout_height="80dp"  
    android:layout_alignParentEnd="true"  
    android:layout_alignParentBottom="true"  
    android:layout_marginEnd="108dp"  
    android:layout_marginBottom="424dp"  
    android:ems="10"  
    android:hint="Email ID"  
    android:inputType="textEmailAddress"  
    android:textSize="28dp" />
```

```
<EditText  
    android:id="@+id/passwordEditText"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_alignParentEnd="true"  
    android:layout_alignParentBottom="true"  
    android:layout_marginEnd="40dp"  
    android:layout_marginBottom="299dp"  
    android:ems="10"  
    android:hint="Password"  
    android:inputType="textPassword"  
    android:textSize="28dp" />
```

```
<Button  
    android:id="@+id/loginBtn"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_alignParentEnd="true"  
    android:layout_alignParentBottom="true"  
    android:layout_marginEnd="173dp"  
    android:layout_marginBottom="189dp"  
    android:text="login"  
    android:textSize="26dp" />
```

</RelativeLayout>

JAVA-CODE

```
package com.example.loginapplication;

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 loginBtn;
    int counter=2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_login);
        emailEditText=findViewById(R.id.emailEditText);
        passwordEditText=findViewById(R.id.passwordEditText);
        loginBtn=findViewById(R.id.loginBtn);
        String registeredEmail=getIntent().getStringExtra("email");
        String registeredPassword=getIntent().getStringExtra("password");
        loginBtn.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_LONG).show();
                }
                counter--;
                if (counter==0)
                {
                    Toast.makeText(getBaseContext(),"FAILED LOGIN
ATTEMPTS",Toast.LENGTH_LONG).show();
                    loginBtn.setEnabled(false);
                }
            }
        });
    }
}
```

```

    }
  });
}
}

```

13) Right click on Java folder-> new-> activity->empty activity-> name it as "LoginSuccessful"

14) Go to xml code of design change the layout to "RelativeLayout"

15) 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/textView2"
        android:layout_width="297dp"
        android:layout_height="190dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="42dp"
        android:layout_marginBottom="400dp"
        android:text="Login Successful"
        android:textSize="38dp" />
</RelativeLayout>

```

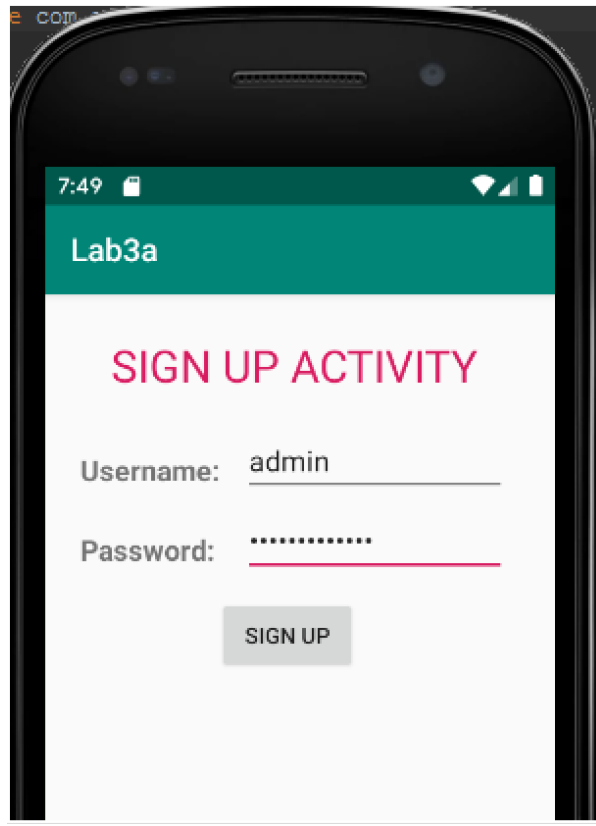
JAVA-CODE

```

package com.example.loginapplication;
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_login_success);
    }
}

```


OUT-PUT



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">

    <TextView
        android:id="@+id/textView"
        android:layout_width="210dp"
        android:layout_height="54dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="120dp"
        android:layout_marginBottom="576dp"
        android:text="Wall Paper Change Application"
        android:textSize="28dp" />

    <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="173dp"
        android:layout_marginBottom="189dp"
        android:text="Click Here To Change Wall Paper"
        android:textSize="26dp" />
</RelativeLayout>
```

JAVA-CODE

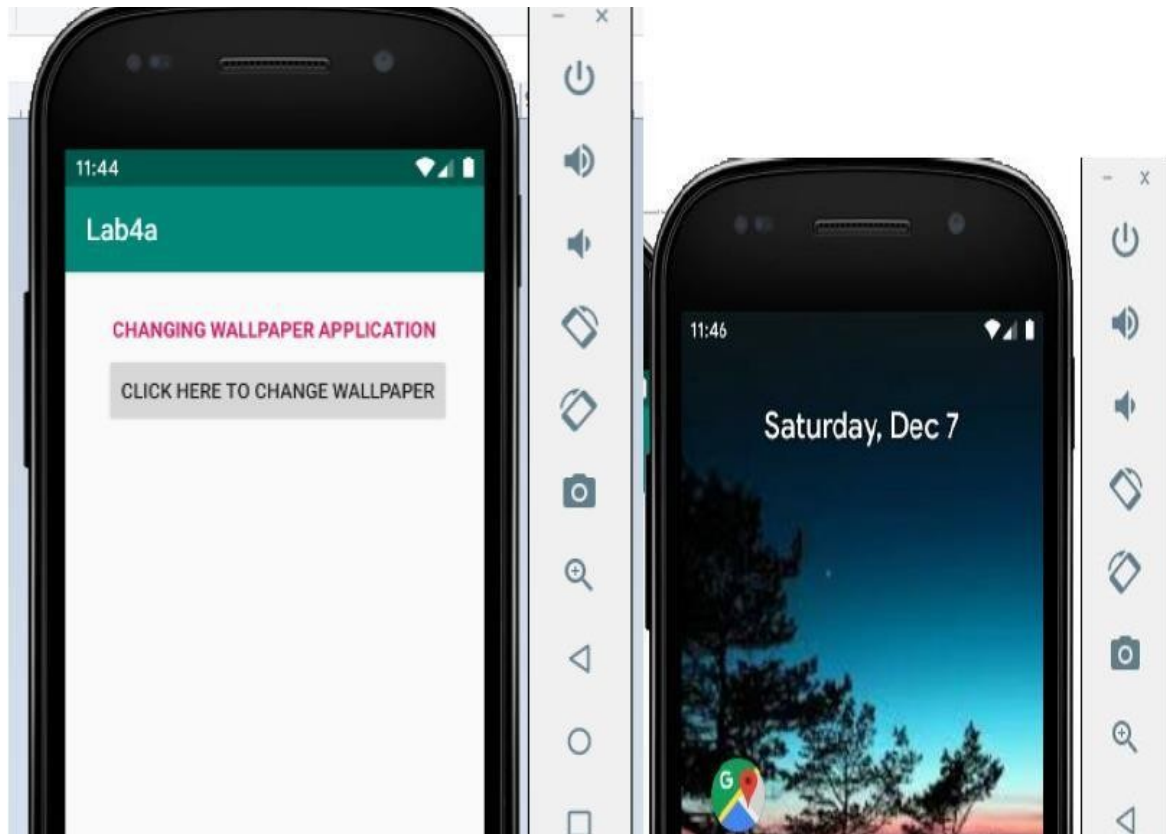
```
import androidx.appcompat.app.AppCompatActivity;
import android.app.WallpaperManager;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.graphics.drawable.AnimationDrawable;
import android.graphics.drawable.BitmapDrawable;
import android.graphics.drawable.Drawable;
import android.os.Bundle;
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 changewallpaper;
    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);
        changewallpaper = findViewById(R.id.button);
        changewallpaper.setOnClickListener(new View.OnClickListener() {
            @Override public void onClick(View view) {
                setWallpaper();
            }
        });
    }
    private void setWallpaper() {
        mytimer.schedule(new TimerTask() {
            @Override
            public void run() {
                if(prev==1) {
                    drawable = getResources().getDrawable(R.drawable.one);
                    prev = 2;
                }
                else if(prev==2) {
                    drawable = getResources().getDrawable(R.drawable.two);
                    prev=3;
                }
            }
        });
    }
}
```

```

else if(prev==3) {
drawable = getResources().getDrawable(R.drawable.three);
prev=4;
}
else if(prev==4) {
drawable = getResources().getDrawable(R.drawable.four);
prev=5;
}
else if(prev==5) {
drawable = getResources().getDrawable(R.drawable.five);
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:layout_width="378dp"
        android:layout_height="68dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="18dp"
        android:layout_marginBottom="602dp"
        android:text="Counter Application"
        android:textSize="38dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/textView"
```

```
android:layout_width="121dp"
android:layout_height="32dp"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="145dp"
android:layout_marginBottom="478dp"
android:text="Counter Value" />
```

```
<Button
    android:id="@+id/btn_start"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="297dp"
    android:layout_marginBottom="295dp"
    android:text="Start" />
```

```
<Button
    android:id="@+id/btn_stop"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="74dp"
    android:layout_marginBottom="292dp"
    android:text="Stop" />
```

```
</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;

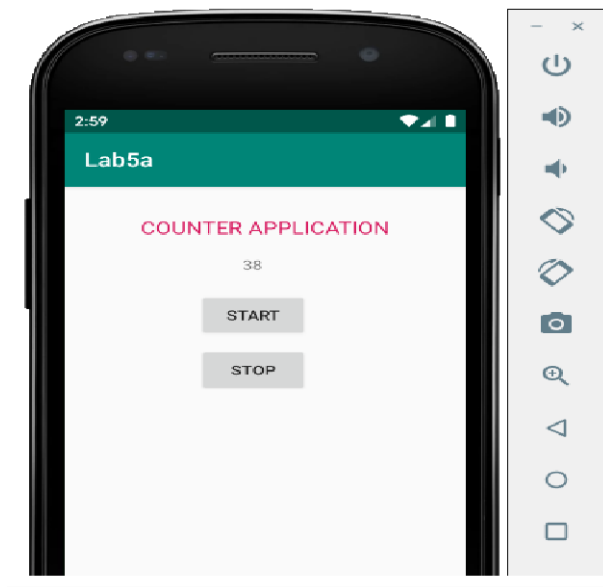
public class MainActivity extends AppCompatActivity {
    Button btnstart, btnstop;
    TextView txtcounter;
    int i=1;
    Handler customHandler=new Handler();
    @Override
```

```

protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    btnstart=findViewById(R.id.btn_start);
    btnstop=findViewById(R.id.btn_stop);
    txtcounter=findViewById(R.id.textView);
    btnstart.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            customHandler.postDelayed(updateTimerThread,0);
        }
    });
    btnstop.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(""+i);
        customHandler.postDelayed(this,1000);
        i++;
    }
};
}

```

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->Assets 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>12.97165</lat>
    <long>77.5946</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": "12.97165",
    "long": "77.5946",
    "temperature": "25",
    "humidity": "74 %"
  }
]
```

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="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="10dp"
        android:layout_marginBottom="634dp"
        android:text="Parsing XML and JSON"
        android:textSize="36sp" />

    <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="153dp"
        android:layout_marginBottom="484dp"
        android:onClick="parsexml"
        android:text="ParseXML" />

    <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="151dp"
        android:layout_marginBottom="364dp"
        android:onClick="parsejson"
        android:text="ParseJSON" />

<TextView
    android:id="@+id/display"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="3dp"
    android:layout_marginBottom="68dp"
    android:text=""
    android:textAlignment="center" />
</RelativeLayout>

```

JAVA-CODE:

```

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.text.style.TabStopSpan;
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 = (TextView)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("\nName: ").append(getValue("name", element));
stringBuilder.append("\nLatitude: ").append(getValue("lat", element));
stringBuilder.append("\nLongitude: ").append(getValue("long", element));
stringBuilder.append("\nTemperature: ").append(getValue("temperature", element));
stringBuilder.append("\nHumidity: ").append(getValue("humidity", element));
stringBuilder.append("\n-----");
}
}
display.setText(stringBuilder.toString());
}catch (Exception e){
e.printStackTrace();
Toast.makeText(MainActivity.this,"Error Parsing XML",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("\nName: ").append(jsonObject.getString("name"));
stringBuilder.append("\nLatitude: ").append(jsonObject.getString("lat"));
stringBuilder.append("\nLongitude: ").append(jsonObject.getString("long"));
stringBuilder.append("\nTemperature: ").append(jsonObject.getString("temperature"));
stringBuilder.append("\nHumidity: ").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",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="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="59dp"
        android:layout_marginRight="59dp"
        android:layout_marginBottom="649dp"
        android:text="Text2SpeechApp"
        android:textSize="40dp" />

    <EditText
        android:id="@+id/editText"
        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="514dp"
        android:ems="10"
        android:hint="Enter the text to be converted"
        android:inputType="textPersonName"
        android:text="" />

```

```

<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="162dp"
    android:onClick="convert"
    android:layout_marginRight="162dp"
    android:layout_marginBottom="329dp"
    android:text="Convert" />

```

```

</RelativeLayout>

```

JAVA-CODE:

```

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.speech.tts.TextToSpeech;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

```

```

import java.util.Locale;

```

```

public class MainActivity extends AppCompatActivity {
    TextToSpeech t1;
    EditText e1;
    @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 view){  
    String tospeak = e1.getText().toString();  
    t1.speak(tospeak,TextToSpeech.QUEUE_FLUSH,null);  
}  
}
```

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 text of 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:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <TextView
        android:layout_width="298dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="54dp"
        android:layout_marginBottom="575dp"
        android:text="Call Application"
        android:textSize="36dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
```



```
<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="176dp"
    android:layout_marginBottom="462dp"
    android:ems="10"
    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="52dp"
    android:layout_marginBottom="459dp"
    android:text="Clear" />
```

```
<Button
    android:id="@+id/button2"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="311dp"
    android:onClick="inputNumber"
    android:layout_marginBottom="341dp"
    android:text="1" />
```

```
<Button
    android:id="@+id/button3"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:onClick="inputNumber"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="170dp"
    android:layout_marginBottom="341dp"
    android:text="2" />
```

```
<Button
    android:id="@+id/button4"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
```

```
android:layout_alignParentBottom="true"
android:layout_marginEnd="32dp"
android:onClick="inputNumber"
android:layout_marginBottom="343dp"
android:text="3" />
```

```
<Button
    android:id="@+id/button5"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:onClick="inputNumber"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="311dp"
    android:layout_marginBottom="241dp"
    android:text="4" />
```

```
<Button
    android:id="@+id/button6"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="175dp"
    android:onClick="inputNumber"
    android:layout_marginBottom="239dp"
    android:text="5" />
```

```
<Button
    android:id="@+id/button7"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="32dp"
    android:onClick="inputNumber"
    android:layout_marginBottom="239dp"
    android:text="6" />
```

```
<Button
    android:id="@+id/button8"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="313dp"
    android:onClick="inputNumber"
    android:layout_marginBottom="142dp"
    android:text="7" />
```

```
<Button
    android:id="@+id/button9"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="171dp"
    android:onClick="inputNumber"
    android:layout_marginBottom="147dp"
    android:text="8" />
```

```
<Button
    android:id="@+id/button10"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="34dp"
    android:onClick="inputNumber"
    android:layout_marginBottom="152dp"
    android:text="9" />
```

```
<Button
    android:id="@+id/button11"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="309dp"
    android:onClick="inputNumber"

    android:layout_marginBottom="80dp"
    android:text="#" />
```

```
<Button
    android:id="@+id/button12"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="169dp"
    android:onClick="inputNumber"
    android:layout_marginBottom="78dp"
    android:text="0" />
```

```
<Button
    android:id="@+id/button13"
    android:layout_width="76dp"
```

```

        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="34dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="88dp"
        android:text="*" />

<Button
    android:id="@+id/callBtn"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="284dp"
    android:layout_marginBottom="17dp"
    android:text="Call" />

<Button
    android:id="@+id/saveBtn"
    android:layout_width="76dp"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="60dp"
    android:layout_marginBottom="17dp"
    android:text="Save" />
</RelativeLayout>

```

JAVA-CODE

```

package com.example.callingapplication;
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 {
    EditText phoneNumberEditText;
    Button clearBtn,callBtn,saveBtn;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        phoneNumberEditText=findViewById(R.id.phoneNumberEditText);
    }
}

```

```

callBtn=findViewById(R.id.callBtn);
saveBtn=findViewById(R.id.saveBtn);
clearBtn=findViewById(R.id.clearBtn);
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:

