VEMANA INSTITUTE OF TECHNOLOGY

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Approved by AICTE, New Delhi,
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LAB MANUAL
MOBILE APPLICATION DEVELOPMENT LAB (18CSMP68)

Prepared by
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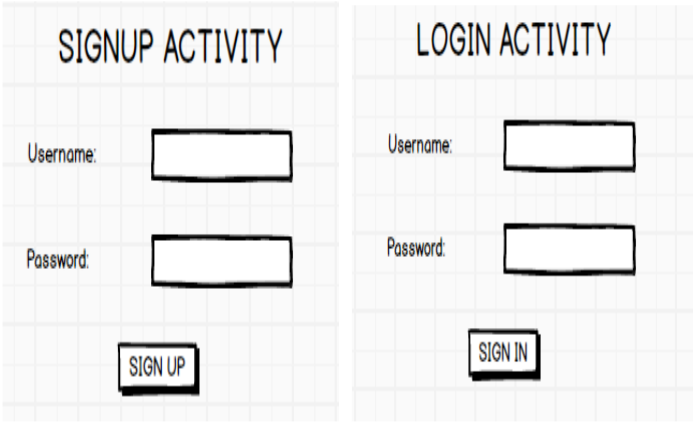
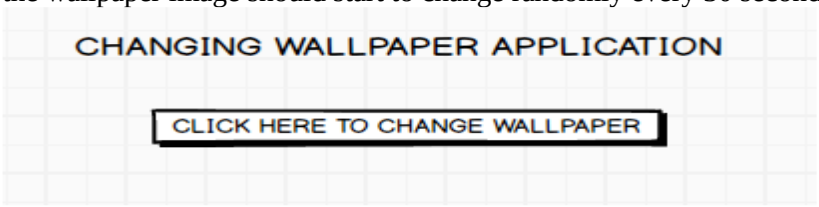
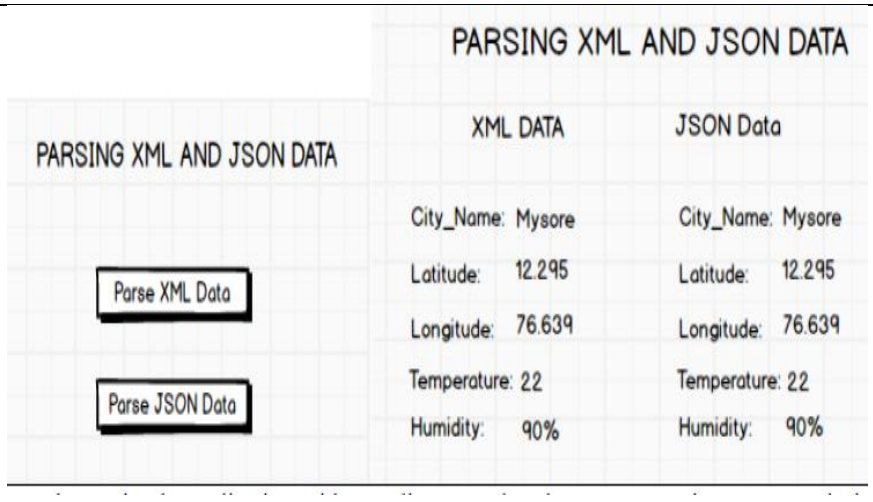
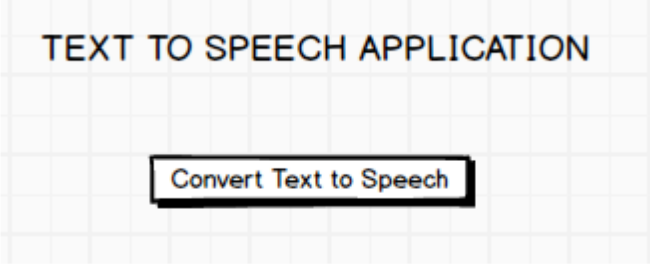
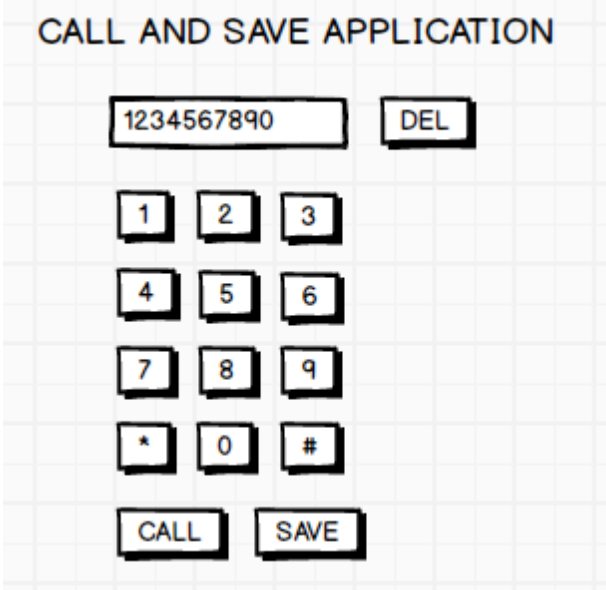
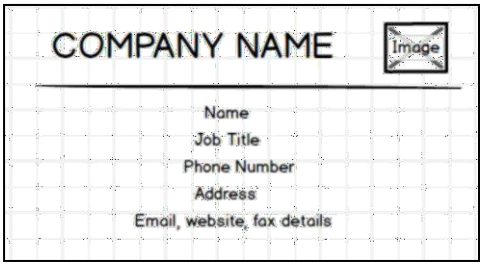
	navigate to the next activity whichdisplays a message saying "Successful Login" or else display a toast message saying "Login Failed".The user is given only two attempts and after thatdisplay a toast message saying "Failed Login Attempts" and disable the SIGN IN button. Use Bundle to transfer information from one activity to another. 	
04	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. 	28-31
05	Write a program to create an activity with two buttons START and STOP. On pressingoftheSTART 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 	32-34
06	Create two files of XML and JSON type with values for City_Name, Latitude, Longitude, Temperature,andHumidity. 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.	35-40

		
07	Develop a simple application withoneEditTextso 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. 	41-44
08	Create an activity like a phone dialer withCALLand 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. 	45-52

PART A

Program 1

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.

Design

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:paddingLeft="20dp"
    android:paddingTop="30dp"
    android:paddingRight="20dp"
    tools:context=".MainActivity">

    <RelativeLayout
        android:layout_width="match_parent"
        android:layout_height="70dp">
        <TextView android:id="@+id/textView"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginStart="10dp"
            android:layout_marginBottom="20dp"
            android:gravity="center"
            android:text="VEMANA Institute of Technology"
            android:textAllCaps="true"
            android:textColor="#E61717"
            android:textSize="17sp" />

        <ImageView
            android:id="@+id/imageView4"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginStart="-23dp"
            android:layout_marginLeft="-2dp"
            android:layout_marginBottom="20dp"
            android:layout_toRightOf="@id/textView"
            app:srcCompat="@drawable/logo1" />

    </RelativeLayout>

    <View android:layout_width="match_parent"
        android:layout_height="2dp"
        android:background="#000000"
        />
    <TextView android:layout_width="match_parent"
```

```
    android:layout_height="wrap_content"
    android:text="Manjunatha P B"
    android:textStyle="bold"
    android:textSize="20dp"
    android:layout_marginBottom="10dp"
    android:layout_marginTop="20dp"
    android:textColor="#000000"
    android:gravity="center" />

  <TextView android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Associate Professor"
    android:textSize="18dp"
    android:layout_marginBottom="10dp"
    android:layout_marginTop="10dp"
    android:textColor="#000000"
    android:gravity="center" />

  <View android:layout_width="match_parent"
    android:layout_height="2dp"
    android:background="#000000" />
  <TextView android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="+91-9731152243"
    android:textSize="18dp"
    android:layout_marginBottom="10dp"
    android:layout_marginTop="10dp"
    android:textColor="#000000"
    android:gravity="center" />
  <TextView android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Bangalore"
    android:textSize="18dp"
    android:layout_marginBottom="10dp"
    android:layout_marginTop="10dp"
    android:textColor="#000000"
    android:gravity="center" />
  <TextView android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Email:manjupb.reddy@gmail.com"
    android:textSize="18dp"
    android:layout_marginBottom="10dp"
    android:layout_marginTop="10dp"
    android:textColor="#000000"
    android:gravity="center" />
  <TextView android:id="@+id/textView2"
```

```
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:layout_marginBottom="10dp"
    android:gravity="center"
    android:text="Website:https://www.vemanait.edu.in"
    android:textColor="#000000"
    android:textSize="18dp" />
</LinearLayout>
```

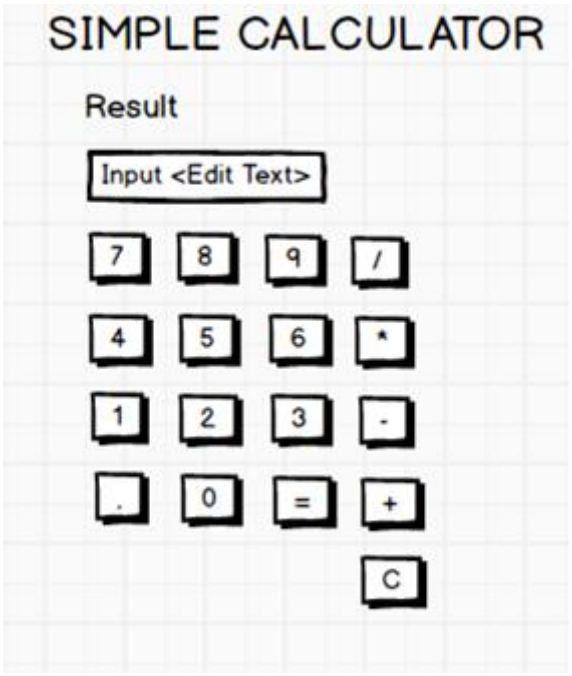
MainActivity.java

```
package com.example.myapplication1;

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);
   }
}
```

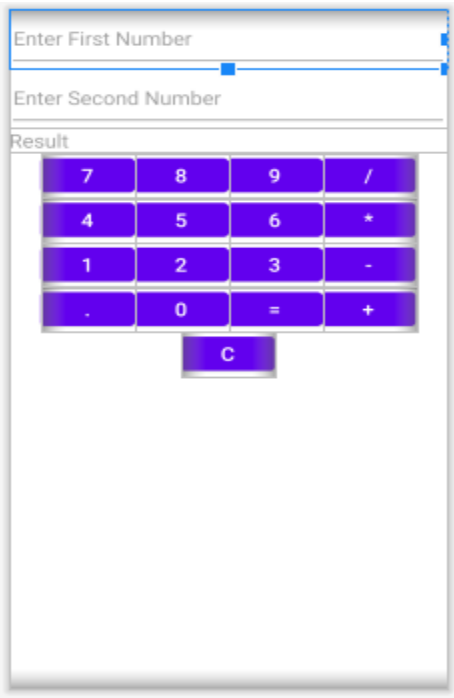
Sample Output

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.



Design



activity_main.xml

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

    <EditText
        android:id="@+id/num1"
        android:layout_width="match_parent"
        android:layout_height="64dp"
        android:hint="Enter First Number"
        android:textAlignment="center"
        android:textSize="20sp" />

    <EditText
        android:id="@+id/num2"
        android:layout_width="match_parent"
        android:layout_height="64dp"
        android:hint="Enter Second Number"
        android:textAlignment="center"
        android:textSize="20sp" />
    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Result"
        android:id="@+id/result"
        android:textAlignment="center"
        android:textSize="20sp"
        />

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

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

```
        android:text="7"
        android:textSize="20sp"
        android:onClick="seven"
        android:textAlignment="center" />
    <Button
        android:id="@+id/eight"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="8"
        android:onClick="eight"
        android:textSize="20sp"
        android:textAlignment="center" />

    <Button
        android:id="@+id/nine"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="9"
        android:onClick="nine"
        android:textAlignment="center"
        android:textSize="20sp" />
    <Button
        android:id="@+id/divide"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="/"
        android:onClick="division"
        android:textAlignment="center"
        android:textSize="20sp" />

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

    <Button
        android:id="@+id/four"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="4"
        android:onClick="four"
        android:textAlignment="center"
        android:textSize="20sp" />
    <Button
```

```
        android:id="@+id/five"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="5"
        android:onClick="five"
        android:textAlignment="center"
        android:textSize="20sp" />
    <Button
        android:id="@+id/six"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="6"
        android:onClick="six"
        android:textAlignment="center"
        android:textSize="20sp" />
    <Button
        android:id="@+id/multiply"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="*"
        android:onClick="multiply"
        android:textAlignment="center"
        android:textSize="20sp" />

</LinearLayout>
<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:orientation="horizontal">
    <Button
        android:id="@+id/one"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="1"
        android:onClick="one"
        android:textAlignment="center"
        android:textSize="20sp" />
    <Button
        android:id="@+id/two"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="2"
        android:onClick="two"
        android:textAlignment="center"
        android:textSize="20sp" />
```

```
    <Button
      android:id="@+id/three"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="3"
      android:onClick="three"
      android:textAlignment="center"
      android:textSize="20sp" />
    <Button
      android:id="@+id/minus"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="-"
      android:onClick="sub"
      android:textAlignment="center"
      android:textSize="20sp" />
  </LinearLayout>
  <LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:orientation="horizontal">
    <Button
      android:id="@+id/dot"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="."
      android:onClick="dot"
      android:textAlignment="center"
      android:textSize="20sp" />
    <Button
      android:id="@+id/zero"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="0"
      android:onClick="zero"
      android:textAlignment="center"
      android:textSize="20sp" />
    <Button
      android:id="@+id/equals"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="="
      android:onClick="compute"
      android:textAlignment="center"
      android:textSize="20sp" />
```

```
        <Button
            android:id="@+id/add"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="+"
            android:onClick="add"
            android:textAlignment="center"
            android:textSize="20sp" />
    </LinearLayout>
    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        android:layout_gravity="center">
        <Button
            android:id="@+id/All_Clear"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="C"
            android:onClick="All_Clear"
            android:textAlignment="center"
            android:textSize="20sp" />

    </LinearLayout>
</LinearLayout>
```

MainActivity.java

```
package com.example.calculator;

import androidx.appcompat.app.AppCompatActivity;

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

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

```
    number1=findViewById(R.id.num1);
    number2=findViewById(R.id.num2);
    res=findViewById(R.id.result);
}
public void one(View v)
{
    if(number1.hasFocus())
    {
        number1.append("1");
    }
    else if(number2.hasFocus())
    {
        number2.append("1");
    }
    else
    {
        Toast.makeText(this, "Please focus on the first/second field", Toast.LENGTH_LONG).show();
    }
}

public void two(View v)
{
    if(number1.hasFocus())
    {
        number1.append("2");
    }
    else if(number2.hasFocus())
    {
        number2.append("2");
    }
    else
    {
        Toast.makeText(this, "Please focus on the first/second field", Toast.LENGTH_LONG).show();
    }
}

public void three(View v)
{
    if(number1.hasFocus())
    {
        number1.append("3");
    }
    else if(number2.hasFocus())
    {
        number2.append("3");
    }
```

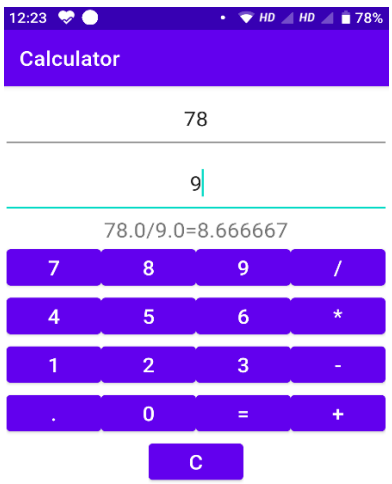
```
    else
    {
        Toast.makeText(this, "Please focus on the first/second field", Toast.LENGTH_LONG).show();
    }
}
public void four(View v)
{
    if(number1.hasFocus())
    {
        number1.append("4");
    }
    else if(number2.hasFocus())
    {
        number2.append("4");
    }
    else
    {
        Toast.makeText(this, "Please focus on the first/second field", Toast.LENGTH_LONG).show();
    }
}

public void five(View v)
{
    if(number1.hasFocus())
    {
        number1.append("5");
    }
    else if(number2.hasFocus())
    {
        number2.append("5");
    }
    else
    {
        Toast.makeText(this, "Please focus on the first/second field", Toast.LENGTH_LONG).show();
    }
}
public void six(View v)
{
    if(number1.hasFocus())
    {
        number1.append("6");
    }
    else if(number2.hasFocus())
    {
        number2.append("6");
    }
```

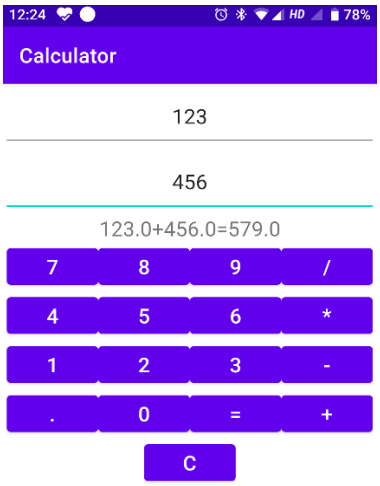
```
    else
    {
        Toast.makeText(this, "Please focus on the first/second field", Toast.LENGTH_LONG).show();
    }
}
public  void seven( View v)
{
    if(number1.hasFocus())
    {
        number1.append("7");
    }
    else if(number2.hasFocus())
    {
        number2.append("7");
    }
    else
    {
        Toast.makeText(this, "Please focus on the first/second field", Toast.LENGTH_LONG).show();
    }
}
public void eight(View v)
{
    if(number1.hasFocus())
    {
        number1.append("8");
    }
    else if(number2.hasFocus())
    {
        number2.append("8");
    }
    else
    {
        Toast.makeText(this, "Please focus on the first/second field", Toast.LENGTH_LONG).show();
    }
}
public void nine(View v)
{
    if(number1.hasFocus())
    {
        number1.append("9");
    }
    else if(number2.hasFocus())
    {
        number2.append("9");
    }
    else
```

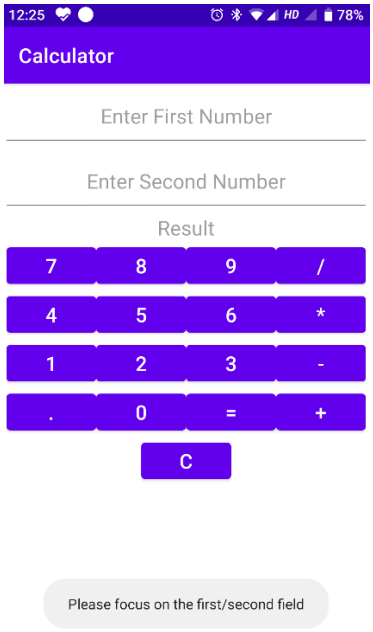
```
    {
        Toast.makeText(this, "Please focus on the first/second field", Toast.LENGTH_LONG).show();
    }
}
public void zero(View v)
{
    if(number1.hasFocus())
    {
        number1.append("0");
    }
    else if(number2.hasFocus())
    {
        number2.append("0");
    }
    else
    {
        Toast.makeText(this, "Please focus on the first/second field", Toast.LENGTH_LONG).show();
    }
}
public void dot(View v)
{
    if(number1.hasFocus())
    {
        number1.append(".");
    }
    else if(number2.hasFocus())
    {
        number2.append(".");
    }
    else
    {
        Toast.makeText(this, "Please focus on the first/second field", Toast.LENGTH_LONG).show();
    }
}
public void add(View v)
{
    op='+';
}
public void sub(View v)
{
    op='-';
}
public void multiply(View v)
{
    op='*';
}
```

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

            case '-' :  n1=Float.parseFloat(number1.getText().toString());
                        n2=Float.parseFloat(number2.getText().toString());
                        r=n1-n2;
                       res.setText(""+n1+"-"+n2+"="+r);
                       break;

            case '*' :  n1=Float.parseFloat(number1.getText().toString());
                        n2=Float.parseFloat(number2.getText().toString());
                        r=n1*n2;
                        res.setText(""+n1+"*"+n2+"="+r);
                        break;

            case '/' :  n1=Float.parseFloat(number1.getText().toString());
                        n2=Float.parseFloat(number2.getText().toString());
                        r=n1/n2;
                       res.setText(""+n1+"/"+n2+"="+r);
                       break;

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

Sample Output





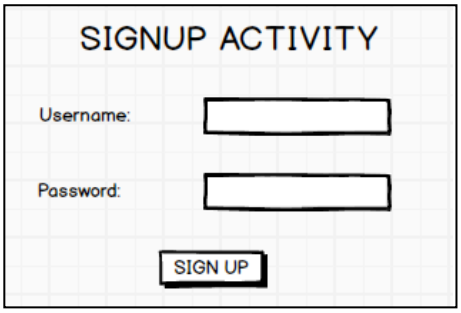


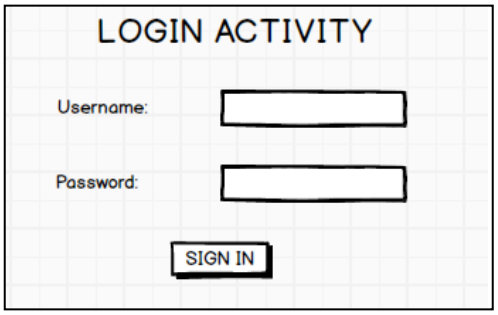
Program 3

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

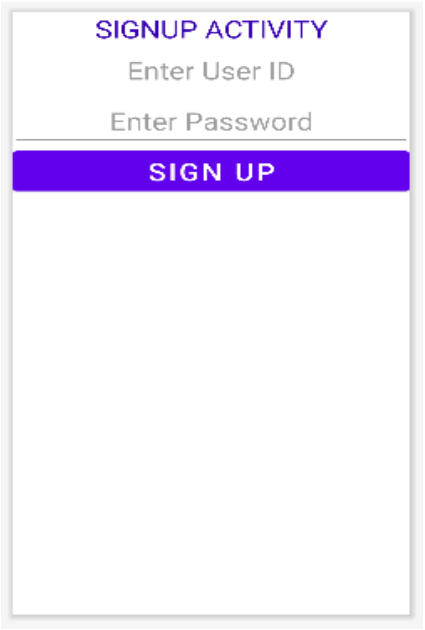
- Password should contain uppercase and lowercase letters.
- Password should contain letters and numbers.
- Password should contain special characters.
- Minimum length of the password (the default value is 8).

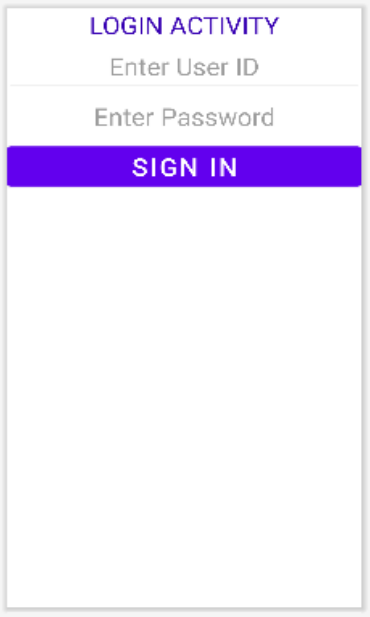
On successful **SIGN UP** proceed to the next Login activity. Here the user should **SIGN IN** using the Username and Password created during signup activity. If the Username and Password are matched then navigate to the next activity which displays a message saying "Successful Login" or else display 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.

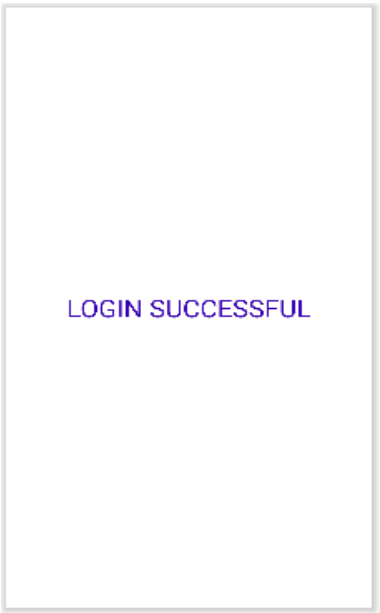




Design







Activity Main.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="SIGNUP ACTIVITY"
        android:textAlignment="center"
        android:textColor="@color/purple_700"
        android:textSize="30sp" />
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter User ID"
        android:id="@+id/uid"
        android:textSize="30sp"
        android:textAlignment="center"
    />
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Password"
        android:inputType="textPassword"
        android:textAlignment="center"
        android:textSize="30sp"
        android:id="@+id/pwd"
        />
    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="SIGN UP"
        android:id="@+id/signup"
        android:onClick="signup"
        android:textSize="30sp"
        android:textAlignment="center"
        />

</LinearLayout>
```

Activity_Main1.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".Signin1">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="LOGIN ACTIVITY"
        android:textSize="30sp"
        android:textAlignment="center"
        android:textColor="@color/purple_700" />
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/uid"
        android:hint="Enter User ID"
        android:textSize="30sp"
        android:textAlignment="center" />
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Password"
        android:inputType="textPassword"
        android:id="@+id/pwd"
        android:textSize="30sp"
        android:textAlignment="center" />
    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/sinin"
        android:text="SIGN IN"
        android:textSize="30sp"
        android:textAlignment="center"
        android:onClick="signin" />

</LinearLayout>
```

Activity_Success.xml

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

    tools:context=".Success">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:text="LOGIN SUCCESSFUL"
        android:textAlignment="center"
        android:textColor="@color/purple_700"
        android:textSize="30sp" />

</LinearLayout>
```

Mainactivity.java

```
package com.example.signup1;

import androidx.appcompat.app.AppCompatActivity;

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

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

public class MainActivity extends AppCompatActivity {
EditText username,passwd;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        username=findViewById(R.id.uid);
        passwd=findViewById(R.id.pwd);
```

```
    }
    public void signup(View v)
    {
        if(passwd.getText().toString().length()>=8 && validatepassword(passwd.getText().toString()))
        {
            Toast.makeText(this, "Sign Up Successful", Toast.LENGTH_LONG).show();
            Intent i= new Intent(this, Signin1.class);
            Bundle b=new Bundle();
            b.putString("uid", username.getText().toString());
            b.putString("password", passwd.getText().toString());
            i.putExtras(b);
            startActivity(i);
        }
        else
        {
            Toast.makeText(this, "Password is not matching the constraints", Toast.LENGTH_LONG).show();
        }
    }
    public boolean validatepassword(String password)
    {
        Pattern ptrn;
        Matcher mat;
        String passwordptrn="^(?=.*[A-Z])(?=.*[a-z])(?=.*[0-9])(?=.*[<>$#@=+])(?=\\S+$).{8,}";
        ptrn=Pattern.compile(passwordptrn);
        mat=ptrn.matcher(password);
        return mat.matches();
    }

}
```

Signin1.java

```
package com.example.signup1;

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 Signin1 extends AppCompatActivity {
EditText username,password;
Button signin;
```

```
int attempts=0;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_signin1);
      username=findViewById(R.id.uid);
      password=findViewById(R.id.pwd);
      signin=findViewById(R.id.sinin);

   }
   public void signin(View v)
   {
      Bundle b=getIntent().getExtras();
      String uname=b.getString("uid");
      String passwd=b.getString("password");
      if(username.getText().toString().equals(uname) && password.getText().toString().equals(passwd))
      {
         Toast.makeText(this, "Sign In Success", Toast.LENGTH_LONG).show();
         attempts=0;
         Intent i= new Intent(this, Success.class);
         startActivity(i);
      }
      else
      {
         attempts++;
         Toast.makeText(this, "Sign in Unsuccessful", Toast.LENGTH_LONG).show();
         if(attempts==3)
         {
            signin.setEnabled(false);
         }
      }

   }
}
```

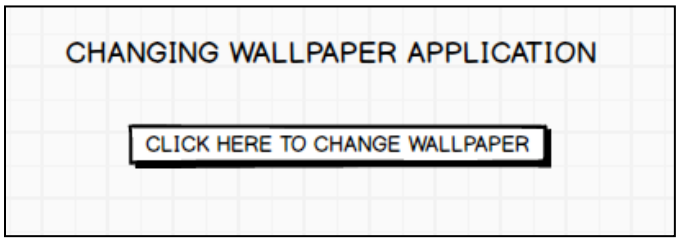
Success.java

```
package com.example.signup1;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

public class Success extends AppCompatActivity {

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

Sample Output

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_WALLPAPPER 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.
8.

activity_main.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Wallpaper changing App"
        android:textAlignment="center"
        android:textColor="#679399"
        android:textSize="30dp"
        />

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

```
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:onClick="changewallpaper"
    android:text="Change Wallpaper" />


</LinearLayout>
```

MainActivity.java

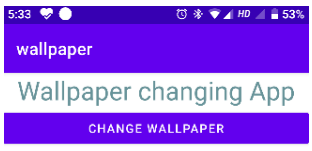
```
package com.example.wallpaper;

import androidx.appcompat.app.AppCompatActivity;

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

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

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

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      mytimer=new Timer();
      wpm=WallpaperManager.getInstance(this);
   }
public void changewallpaper(View v)
{
   setwallpaper();
}
public void setwallpaper()
{
   mytimer.schedule(new TimerTask() {
      @Override
      public void run() {
```

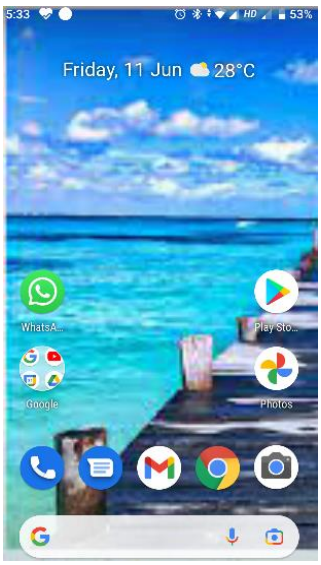
```
        if (next==1)
        {
           drawable=getResources().getDrawable(R.drawable.one);
           next=2;
        }
        else if(next==2)
        {
           drawable=getResources().getDrawable(R.drawable.two);
           next=3;
        }
        else if(next==3)
        {
           drawable=getResources().getDrawable(R.drawable.three);
           next=4;
        }
        else if(next==4)
        {
           drawable=getResources().getDrawable(R.drawable.four);
           next=5;
        }
        else if(next==5)
        {
           drawable=getResources().getDrawable(R.drawable.five);
           next=6;
        }
        else if(next==6)
        {
           drawable=getResources().getDrawable(R.drawable.six);
           next=1;
        }
        Bitmap img=((BitmapDrawable)drawable).getBitmap();

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

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

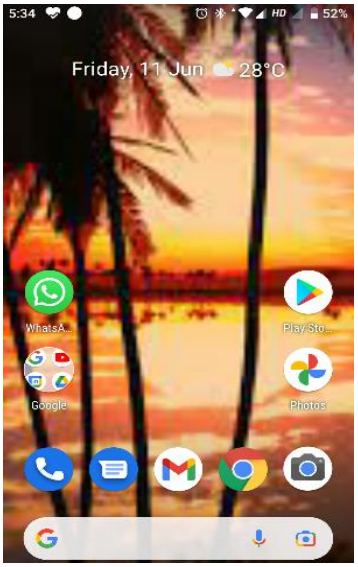
AndriodManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.wallpaper">

    <uses-permission android:name="android.permission.SET_WALLPAPER" />
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Wallpaper">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

Sample 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

Activity_main.xml

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

    <TextView

        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Counter Application"
        android:textAlignment="center"
        android:textColor="@color/purple_200"
        android:textSize="30sp" />

    <TextView
        android:id="@+id/counter"
        android:layout_width="match_parent"
        android:layout_height="86dp"
        android:textAlignment="center"
        android:textColor="@color/purple_500"
        android:textSize="30sp" />

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

```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:onClick="startcounter"
        android:text="Start"
        android:textAlignment="center"
        android:textColor="@color/teal_200"
        android:textSize="25sp" />

    <Button
        android:id="@+id/stopcounter"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Stop"
        android:textAlignment="center"
        android:textColor="@color/teal_200"
        android:onClick="stopcounter"
        android:textSize="25sp" />

</LinearLayout>
```

Mainactivity.java

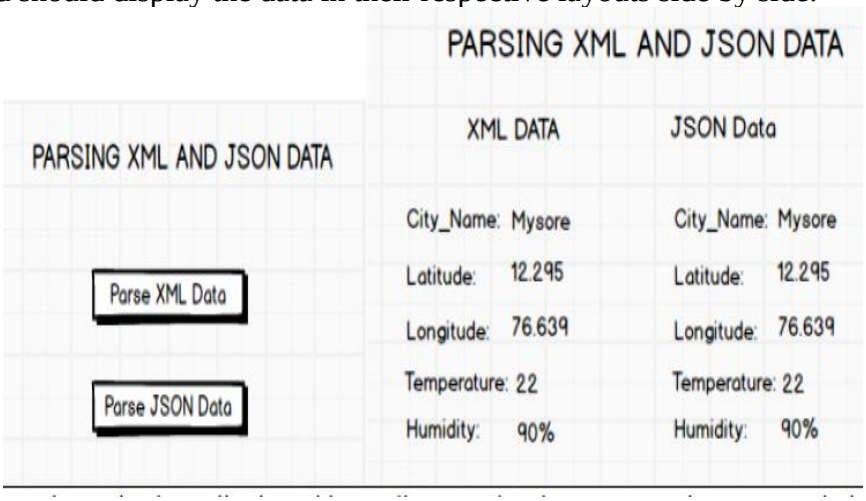
```
package com.example.counter;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {
TextView tv;
Handler myhandler=new Handler();
int i=0;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        tv=findViewById(R.id.counter);
    }
    public void startcounter(View v)
    {
        int i=0;
```

```
        myhandler.postDelayed(Threadcount, 1000);

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

  }

  public Runnable Threadcount=new Runnable() {
     @Override
     public void run() {
        tv.setText(""+i);
        i++;
        myhandler.postDelayed(Threadcount, 1000);
     }
  };
}
```

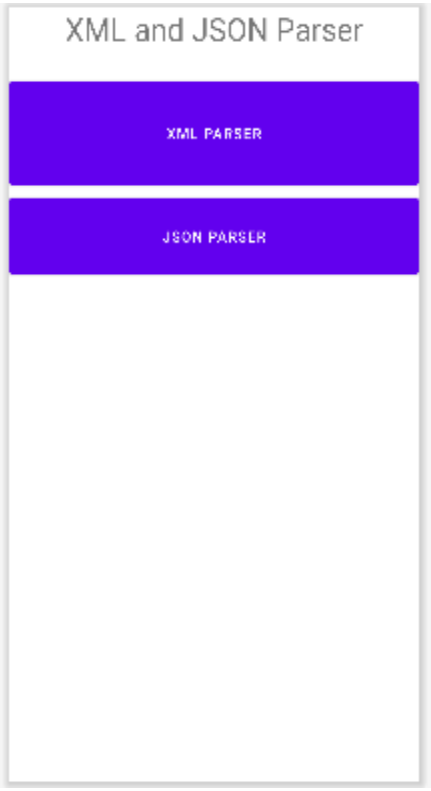
Sample Output

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.



Design



Activity_main.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="64dp"
        android:text="XML and JSON Parser"
        android:textAlignment="center"
        android:textSize="30dp" />

    <Button
        android:layout_width="match_parent"
        android:layout_height="110dp"
        android:onClick="xmlparser"
        android:text="XML Parser"
        android:textAlignment="center" />

    <Button
        android:layout_width="match_parent"
        android:layout_height="84dp"
        android:onClick="jsonparser"
        android:text="JSON Parser"
        android:textAlignment="center" />

    <LinearLayout
        android:layout_width="411dp"
        android:layout_height="116dp"
        android:layout_gravity="center"
        android:orientation="horizontal">

        <TextView
            android:id="@+id/resxml"
            android:layout_width="202dp"
            android:layout_height="match_parent"
            android:paddingLeft="10dp"
            android:paddingRight="40dp"
            android:textAlignment="center"
```

```
        android:textSize="20dp" />

    <TextView
        android:id="@+id/resjson"
        android:layout_width="201dp"
        android:layout_height="match_parent"
        android:paddingLeft="40dp"
        android:textAlignment="center"
        android:textSize="20dp" />
  </LinearLayout>

</LinearLayout>
```

Mainactivity.java

```
package com.example.json;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.TextView;
import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;
import org.w3c.dom.Document;
import org.w3c.dom.Element;
import org.w3c.dom.Node;
import org.w3c.dom.NodeList;
import org.xml.sax.SAXException;

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

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

public class MainActivity extends AppCompatActivity {
   TextView resxml,resjson;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      resxml=findViewById(R.id.resxml);
      resjson=findViewById(R.id.resjson);
```

```
}
public void xmlparser(View v)
{
    try {
        InputStream is=getAssets().open("city.xml");
        DocumentBuilderFactory dbFactory=DocumentBuilderFactory.newInstance();
        DocumentBuilder dBuilder=dbFactory.newDocumentBuilder();
        Document doc=dBuilder.parse(is);
        Element element=doc.getDocumentElement();
        element.normalize();
        NodeList nList=doc.getElementsByTagName("place");
        resxml.setText("XML DATA");
        for (int i=0; i<nList.getLength();i++)
        {
            Node node=nList.item(i);
            if (node.getNodeType()==Node.ELEMENT_NODE)
            {
                Element element2=(Element)node;
                resxml.setText(resxml.getText()+"\n City Name:"+getValue("cityname",element2)+"\n");
                resxml.setText(resxml.getText()+"\n Lat:"+getValue("lat",element2)+"\n");
                resxml.setText(resxml.getText()+"\n Long:"+getValue("long",element2)+"\n");
                resxml.setText(resxml.getText()+"\n Temperature"+getValue("temp",element2)+"\n");
                resxml.setText(resxml.getText()+"\n Humidity"+getValue("humidity",element2)+"\n");
                resxml.setText(resxml.getText()+"\n ----------");
            }
        }

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

}
private static String getValue(String tag, Element element)
{
    NodeList nodeList=element.getElementsByTagName(tag).item(0).getChildNodes();
    Node node=nodeList.item(0);
    return node.getNodeValue();
}
public void jsonparser(View v)
{
    String json;
    try {
        InputStream is=getAssets().open("city1.json");
        int size=is.available();
        byte[] buffer=new byte[size];
        is.read(buffer);
```

```
            is.close();
            json=new String(buffer, "UTF-8");
            JSONArray jsonArray=new JSONArray(json);
            resjson.setText("JSON DATA");
            for (int i=0;i<jsonArray.length();i++)
            {
               JSONObject obj=jsonArray.getJSONObject(i);
               resjson.setText(resjson.getText()+"\n City Name:"+obj.getString("name")+"\n");
               resjson.setText(resjson.getText()+"\n Lat:"+obj.getString("lat")+"\n");
               resjson.setText(resjson.getText()+"\n Long:"+obj.getString("long")+"\n");
               resjson.setText(resjson.getText()+"\n Temperature:"+obj.getString("temp")+"\n");
               resjson.setText(resjson.getText()+"\n Humidity:"+obj.getString("humidity")+"\n");
               resjson.setText(resjson.getText()+"\n ----------------------------");
            }
         } catch (IOException | JSONException e) {
            e.printStackTrace();
         }
      }
   }
```

City.XML

```
<?xml version="1.0" ?>
<records>
   <place>
      <cityname> Mysore</cityname>
      <lat>96.95</lat>
      <long>76.73</long>
      <temp>20</temp>
      <humidity>80%</humidity>
   </place>
   <place>
      <cityname> Bangalore</cityname>
      <lat>96.98</lat>
      <long>76.63</long>
      <temp>22</temp>
      <humidity>90%</humidity>
   </place>
</records>
```

City1.JSON

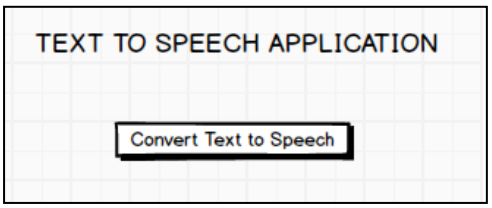
```
[
  {
```

```
   "name": "Mysore",
   "lat":"96.95",
   "long": "76.63",
   "temp": "22",
   "humidity": "90%"
  },
  {
   "name": "Bangalore",
   "lat":"96.97",
   "long": "76.76",
   "temp": "20",
   "humidity": "80%"
  }
]
```

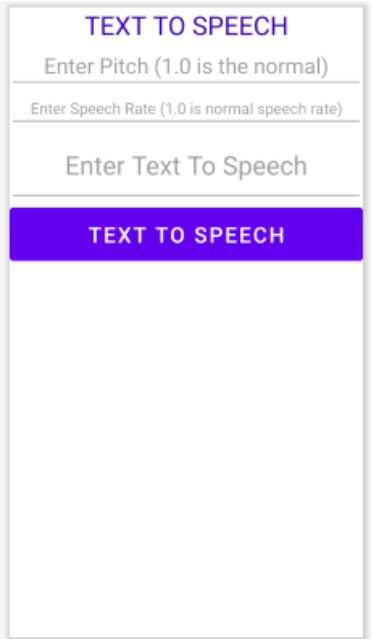

Sample Output

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.



Design:



activity_main.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
```

```
    android:text="TEXT TO SPEECH"
    android:textAlignment="center"
    android:textColor="@color/purple_700"
    android:textSize="30sp" />
  <EditText
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/pitch"
    android:hint="Enter Pitch (1.0 is the normal)"
    android:textSize="25sp"
    android:textAlignment="center"/>
  <EditText
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/speechrate"
    android:hint="Enter Speech Rate (1.0 is normal speech rate)"
    android:textSize="18sp"
    android:textAlignment="center"/>

  <EditText
    android:id="@+id/texttospeech"
    android:layout_width="match_parent"
    android:layout_height="87dp"
    android:hint="Enter Text To Speech"
    android:textAlignment="center"
    android:textSize="30sp" />

  <Button
    android:id="@+id/speek"
    android:layout_width="match_parent"
    android:layout_height="73dp"
    android:text="Text to Speech"
    android:textAlignment="center"
    android:textSize="25sp"
    android:onClick="speak"/>

</LinearLayout>
```

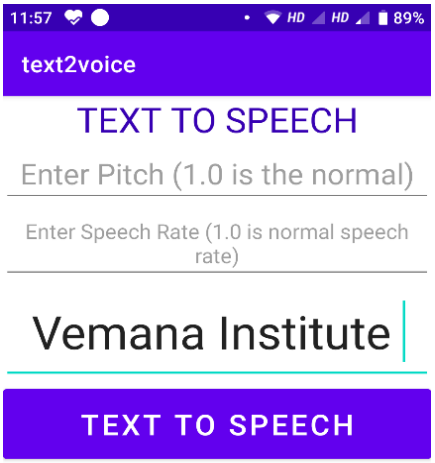
MainActivity.java

```
package com.example.text2voice;
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.Toast;
import java.util.Locale;

public class MainActivity extends AppCompatActivity {
EditText pitch,rate,texttospeak;
Button speak;
TextToSpeech t;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      pitch=findViewById(R.id.pitch);
      rate=findViewById(R.id.speechrate);
      texttospeak=findViewById(R.id.texttospeech);
      t=new TextToSpeech(this, new TextToSpeech.OnInitListener() {
         @Override
         public void onInit(int i) {
            if(i==TextToSpeech.SUCCESS)
            {
               t.setLanguage(Locale.ENGLISH);
            }
            else
            {
               Toast.makeText(MainActivity.this, "Text to Speech Could not initiate",
Toast.LENGTH_LONG).show();
            }

         }
      });

   }
   public void speak(View v)
   {
      String text=texttospeak.getText().toString();
      if (pitch.getText().toString().equals(""))
      {
         t.setPitch(1.0f);
      }
      else
      {
         t.setPitch(Float.parseFloat(pitch.getText().toString()));
      }
      if (rate.getText().toString().equals(""))
      {
```

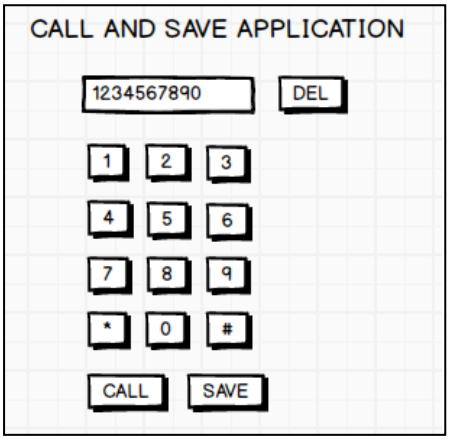
```
            t.setSpeechRate(1.0f);
        }
        else
        {
            t.setSpeechRate(Float.parseFloat(rate.getText().toString()));
        }
        t.speak(text,TextToSpeech.QUEUE_FLUSH,null);
    }
}
```

Sample Output

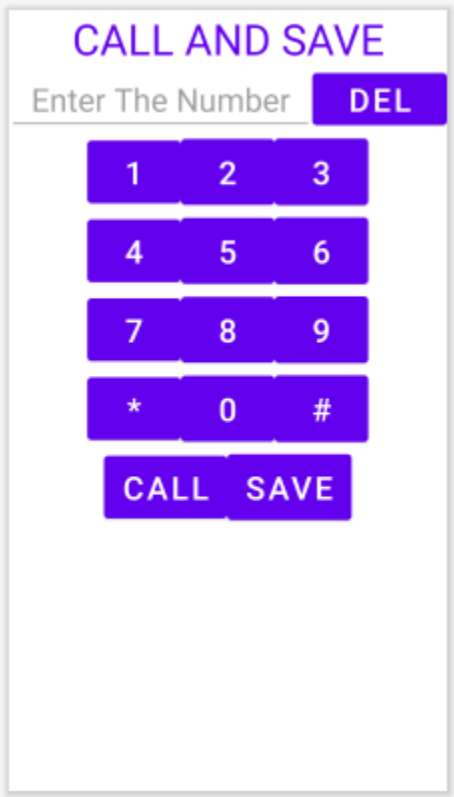


Program 8

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.



Design:



activity_main.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="CALL AND SAVE"
        android:textAlignment="center"
        android:textColor="@color/purple_500"
        android:textSize="40sp" />

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

        <EditText
            android:layout_width="285dp"
            android:layout_height="wrap_content"
            android:hint="Enter The Number"
            android:id="@+id/number"
            android:textAlignment="center"
            android:textSize="30sp" />

        <Button
            android:id="@+id/del"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:onClick="delete"
            android:text="DEL"
            android:textAlignment="center"
            android:textSize="30sp" />
    </LinearLayout>

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

```
    android:layout_gravity="center"
    android:orientation="horizontal"
    android:textAlignment="center">

    <Button
      android:id="@+id/one"
      android:layout_width="wrap_content"
      android:layout_height="70dp"
      android:onClick="one"
      android:text="1"
      android:textAlignment="center"
      android:textSize="30sp" />

    <Button
      android:id="@+id/two"
      android:layout_width="wrap_content"
      android:layout_height="73dp"
      android:onClick="two"
      android:text="2"
      android:textAlignment="center"
      android:textSize="30sp" />

    <Button
      android:id="@+id/three"
      android:layout_width="wrap_content"
      android:layout_height="74dp"
      android:onClick="three"
      android:text="3"
      android:textAlignment="center"
      android:textSize="30sp" />
  </LinearLayout>

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

    <Button
      android:id="@+id/four"
      android:layout_width="wrap_content"
      android:layout_height="70dp"
      android:onClick="four"
      android:text="4"
      android:textAlignment="center"
```

```
        android:textSize="30sp" />

    <Button
        android:id="@+id/five"
        android:layout_width="wrap_content"
        android:layout_height="73dp"
        android:onClick="five"
        android:text="5"
        android:textAlignment="center"
        android:textSize="30sp" />

    <Button
        android:id="@+id/six"
        android:layout_width="wrap_content"
        android:layout_height="74dp"
        android:onClick="six"
        android:text="6"
        android:textAlignment="center"
        android:textSize="30sp" />
</LinearLayout>
<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:orientation="horizontal"
    android:textAlignment="center">

    <Button
        android:id="@+id/seven"
        android:layout_width="wrap_content"
        android:layout_height="70dp"
        android:onClick="seven"
        android:text="7"
        android:textAlignment="center"
        android:textSize="30sp" />

    <Button
        android:id="@+id/eight"
        android:layout_width="wrap_content"
        android:layout_height="73dp"
        android:onClick="eight"
        android:text="8"
        android:textAlignment="center"
        android:textSize="30sp" />

    <Button
```

```
        android:id="@+id/nine"
        android:layout_width="wrap_content"
        android:layout_height="74dp"
        android:onClick="nine"
        android:text="9"
        android:textAlignment="center"
        android:textSize="30sp" />
    </LinearLayout>
    <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_gravity="center"
      android:orientation="horizontal"
      android:textAlignment="center">

      <Button
        android:id="@+id/star"
        android:layout_width="wrap_content"
        android:layout_height="70dp"
        android:onClick="star"
        android:text="*"
        android:textAlignment="center"
        android:textSize="30sp" />

      <Button
        android:id="@+id/zero"
        android:layout_width="wrap_content"
        android:layout_height="73dp"
        android:onClick="zero"
        android:text="0"
        android:textAlignment="center"
        android:textSize="30sp" />

      <Button
        android:id="@+id/hash"
        android:layout_width="wrap_content"
        android:layout_height="74dp"
        android:onClick="hash"
        android:text="#"
        android:textAlignment="center"
        android:textSize="30sp" />
    </LinearLayout>

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

```
    android:layout_gravity="center"
    android:orientation="horizontal"
    android:textAlignment="center">

    <Button
      android:id="@+id/call"
      android:layout_width="wrap_content"
      android:layout_height="70dp"
      android:onClick="call"
      android:text="CALL"
      android:textAlignment="center"
      android:textSize="30sp" />

    <Button
      android:id="@+id/save"
      android:layout_width="wrap_content"
      android:layout_height="73dp"
      android:onClick="save"
      android:text="SAVE"
      android:textAlignment="center"
      android:textSize="30sp" />

  </LinearLayout>


</LinearLayout>
```

MainActivity.java

```
package com.example.call;

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.EditText;

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

```
    num=findViewById(R.id.number);
}

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

}
public void one(View v)
{
    num.append("1");
}
 public void two(View v)
 {
     num.append("2");
 }
 public void three(View v)
 {
     num.append("3");
 }
 public void four(View v)
 {
     num.append("4");
 }
 public void five(View v)
 {
     num.append("5");
 }
 public void six(View v)
 {
     num.append("6");
 }
 public void seven(View v)
 {
     num.append("7");
 }
 public void eight(View v)
 {
     num.append("8");
 }
 public void nine(View v)
 {
     num.append("9");
 }
```

```
    public void star(View v)
    {
       num.append("*");
    }
    public void zero(View v)
    {
       num.append("0");
    }
    public void hash(View v)
    {
       num.append("#");
    }
    public  void call(View v)
    {
       String mynum=num.getText().toString();
       Intent i=new Intent(Intent.ACTION_DIAL, Uri.parse("tel:"+mynum));
       startActivity(i);
    }
    public void save(View v)
    {
       String mynum=num.getText().toString();
       Intent i=new Intent(Intent.ACTION_INSERT, ContactsContract.Contacts.CONTENT_URI);
       i.putExtra(ContactsContract.Intents.Insert.PHONE,mynum);
       startActivity(i);

    }
}
```

Sample Output