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

MainActivity.xml

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

      <TextView
      android:id="@+id/textView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_alignParentEnd="true"
      android:layout_alignParentBottom="true"
      android:layout_marginEnd="99dp"
      android:layout_marginBottom="601dp"
      android:text="Simple Calculator"
      android:textSize="36sp"
      tools:layout_editor_absoluteX="49dp"
      tools:layout_editor_absoluteY="96dp" />

      <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="94dp"
      android:layout_marginBottom="477dp"
      android:ems="10"
      android:inputType="textPersonName"
      android:text=""
      android:hint="enter first no"
      tools:layout_editor_absoluteX="99dp"
      tools:layout_editor_absoluteY="165dp" />

     <EditText
      android:id="@+id/editText2"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_alignParentEnd="true"
```

```xml
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="104dp"
        android:layout_marginBottom="395dp"
        android:ems="10"
        android:inputType="textPersonName"
        android:text=""
        android:hint="enter second no"
        tools:layout_editor_absoluteX="90dp"
        tools:layout_editor_absoluteY="268dp" />

    <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="216dp"
        android:layout_marginBottom="317dp"
        android:text="0"
        android:textSize="36sp"
        tools:layout_editor_absoluteX="168dp"
        tools:layout_editor_absoluteY="376dp" />

    <Button
        android:id="@+id/button1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="258dp"
        android:layout_marginBottom="272dp"
        android:text="Add"
        android:onClick="add"
        tools:layout_editor_absoluteX="45dp"
        tools:layout_editor_absoluteY="467dp" />

    <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="72dp"
        android:layout_marginBottom="267dp"
        android:text="Subtract"
        android:onClick="sub"
        tools:layout_editor_absoluteX="260dp"
        tools:layout_editor_absoluteY="462dp" />

    <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="254dp"
    android:layout_marginBottom="157dp"
        android:text="Mul"
    android:onClick="mul"
    tools:layout_editor_absoluteX="49dp"
    tools:layout_editor_absoluteY="574dp" />

<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="95dp"
    android:layout_marginBottom="155dp"
    android:text="Div"
    android:onClick="div"
    tools:layout_editor_absoluteX="258dp"
    tools:layout_editor_absoluteY="572dp" />
```

MainActivity.java

```java
package com.example.myapp2;

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 = findViewById(R.id.editText1);
    e2 = findViewById(R.id.editText2);
    tv1 = findViewById(R.id.textView1);

    }
```

```java
    public void add(View view) {
    int a1 = Integer.parseInt(e1.getText().toString());
    int a2 = Integer.parseInt(e2.getText().toString());
    int result = a1 + a2;
    tv1.setText("" + result);


    }

    public void sub(View view) {
    int a1 = Integer.parseInt(e1.getText().toString());
    int a2 = Integer.parseInt(e2.getText().toString());
    int result = a1 - a2;
    tv1.setText("" + result);


    }

    public void mul(View view) {
    int a1 = Integer.parseInt(e1.getText().toString());
    int a2 = Integer.parseInt(e2.getText().toString());
    int result = a1 * a2;
    tv1.setText("" + result);


    }

    public void div(View view) {
    int a1 = Integer.parseInt(e1.getText().toString());
    int a2 = Integer.parseInt(e2.getText().toString());
    int result = a1 / a2;
    tv1.setText("" + result);


    }
}
```

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.

MainActivity.xml

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

    <EditText
        android:id="@+id/username"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"
        android:hint="UserName"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.316" />

    <EditText
        android:id="@+id/password"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
```

```xml
            android:inputType="textPassword"
            android:hint="Password"
            app:layout_constraintBottom_toBottomOf="parent"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintHorizontal_bias="0.497"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/signup"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Sign Up"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.717" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Sign Up Page"
        android:textSize="30dp"
        android:textColor="@color/white"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.11" />

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

MainActivity.java

```java
package com.example.loginapplication;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.service.autofill.FieldClassification;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
```

```java
import android.widget.Toast;

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


public class MainActivity extends AppCompatActivity {

    EditText username,password;
    Button signUpBtn;

    String
regularExpr="^(?=.*[A-Z])(?=.*[a-z])(?=.*\\d)(?=.*[@$!])[A-Za-z\\d@$!]{
8,}$";

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

        username = findViewById(R.id.username);
        password = findViewById(R.id.password);
        signUpBtn = findViewById(R.id.signup);

        signUpBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String uname = username.getText().toString();
                String pwd = password.getText().toString();

                if(validatePassword(pwd)){

                    Bundle bundle = new Bundle();

                    bundle.putString("username",uname);
                    bundle.putString("password",pwd);

                    Intent intent = new
Intent(MainActivity.this,loginactivity.class);

                    intent.putExtras(bundle);

                    startActivity(intent);
                }
                else{
                    Toast.makeText(MainActivity.this, "Invaild
Password", Toast.LENGTH_SHORT).show();
                }
            }
        });
```

```java
    }

    public boolean validatePassword(String pwd){
        Pattern pattern = Pattern.compile(regularExpr);
        Matcher matcher = pattern.matcher(pwd);

        return matcher.matches();

    }
}
```

LoginActivity.xml

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

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Sign In Page"
        android:textSize="30dp"
        android:textColor="@color/white"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.143" />

    <EditText
        android:id="@+id/username"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"
        android:hint="UserName"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.38" />
```

```xml
    <EditText
        android:id="@+id/password"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPassword"
        android:hint="Password"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.581" />

    <Button
        android:id="@+id/signin"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Sign In"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.8" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

LoginActivity.java

```java
package com.example.loginapplication;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;

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


public class loginactivity extends AppCompatActivity {

    EditText username,password;
    Button signInBtn;

    int count=0;
```

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

        username = findViewById(R.id.username);
        password = findViewById(R.id.password);
        signInBtn = findViewById(R.id.signin);

        Bundle bundle = getIntent().getExtras();

        String uname = bundle.getString("username");
        String pwd = bundle.getString("password");

        signInBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String user = username.getText().toString();
                String pass = password.getText().toString();

                if(user.equals(uname) && pass.equals(pwd)){
                    Toast.makeText(loginactivity.this, "Success",
Toast.LENGTH_SHORT).show();
                }
                else {
                    count++;
                    if (count >= 3) {
                        signInBtn.setEnabled(false);
                    } else {
                        Toast.makeText(loginactivity.this, "Failed",
Toast.LENGTH_SHORT).show();
                    }
                }

            }
        });


    }
}
```

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.

Activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity">
    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Wall Paper Changing Application"
        android:textAlignment="center"
        android:textSize="30sp"
        android:textColor="@color/design_default_color_primary"
        />
    <Button
        android:layout_marginTop="100dp"
        android:layout_width="match_parent"
            android:layout_height="wrap_content"
android:id="@+id/wp"
    android:text="changewallpaper"
    android:textSize="20sp"

    />
</LinearLayout>
```

MainActivity.java

```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 android.widget.Button;
import java.io.IOException;
import java.util.Timer;
```

```java
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.wp);
        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();
```

```
            }
        }
    },0,3000); }


}
```

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

 MainActivity.xml

```xml
<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">


    <RelativeLayout
        android:id="@+id/lbl_text"
        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"
            android:textSize="30sp"
            />
```

```xml
        <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>


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

MainActivity.java

```java
package com.example.counterapp;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.os.Handler;
import android.os.Message;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import org.w3c.dom.Text;
public class MainActivity extends AppCompatActivity implements
View.OnClickListener{
    TextView lblCounter;
    Button btnStart,btnStop;
    int counter=0;
    boolean running=false;
    @Override
    protected void onCreate(Bundle savedInstanceState){
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        lblCounter=findViewById(R.id.textView);
```

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

        btnStart.setOnClickListener(this);
    }
    public void onClick(View v)
    {
        if(v.equals(btnStart))
        {
            counter=0;
            running=true;
            new MyCounter().start();
        }
        else if(v.equals(btnStop))
        {
            running=false;
        }
    }
    Handler handler=new Handler()
    {
        public void handleMessage(Message m)
        {
            lblCounter. setText(String.valueOf(m.what));
        }
    };
    class MyCounter extends Thread
    {
        public void run()
        {
            while(running)
            {
                counter++;
                handler.sendEmptyMessage(counter);
                try {
                    Thread.sleep(1000);
                }
                catch(Exception e){ }
            }
        }
    }
}
```

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.

MainActivity.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">
    <Button
        android:id="@+id/btn_parsexml"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="80dp"
        android:text="ParseXMLData"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView4"/>
    <Button
        android:id="@+id/btn_parsejson"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="80dp"
        android:text="ParseJsonData"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/btn_parsexml"/>
    <TextView
        android:id="@+id/textView4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:text="PARSINGXMLANDJSONDATA"
        android:textSize="20sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"/>
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```java
package com.example.myapplication;
```

```
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
public class MainActivity extends AppCompatActivity implements
View.OnClickListener {
    Button btnParseXml, btnParseJson;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        btnParseXml = (Button) findViewById(R.id.btn_parsexml);
        btnParseJson = (Button) findViewById(R.id.btn_parsejson);
        btnParseJson.setOnClickListener(this);
        btnParseXml.setOnClickListener(this);
    }
    @Override
    public void onClick(View v) {
        if (v.equals(btnParseJson)) {
            Intent it = new Intent(this, ViewActivity.class);
            it.putExtra("mode", 1);
            startActivity(it);
        } else if (v.equals(btnParseXml)) {
            Intent it = new Intent(this, ViewActivity.class);
            it.putExtra("mode", 2);
            startActivity(it);
        }
    }
}
```

ActivityView.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".ViewActivity">
    <TextView
        android:id="@+id/lbl_xml_data"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="30dp"
        android:text="XmlData"
        app:layout_constraintStart_toStartOf="@+id/textView2"
        app:layout_constraintTop_toBottomOf="@+id/textView2"/>
    <TextView
        android:id="@+id/textView"
```

```xml
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:text="PARSINGXMLANDJSONDATA"
        android:textSize="20dp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"/>
    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="40dp"
        android:layout_marginTop="20dp"
        android:text="XMLDATA"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView"
        android:layout_marginLeft="40dp" />
    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"
        android:layout_marginEnd="40dp"
        android:text="JSONDATA"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView"
        android:layout_marginRight="40dp" />
    <TextView
        android:id="@+id/lbl_json_data"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="30dp"
        android:text="JsonData"
        app:layout_constraintEnd_toEndOf="@+id/textView3"
        app:layout_constraintTop_toBottomOf="@+id/textView3"/>
</androidx.constraintlayout.widget.ConstraintLayout>
```

ActivityView.java

```java
package com.example.myapplication;

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

```java
import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;
public class ViewActivity extends AppCompatActivity
{
    TextView lblXmlData,lblJsonData;
    int mode=0;
    @Override protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_view);
        lblXmlData=(TextView)findViewById(R.id.lbl_xml_data);
        lblJsonData=(TextView)findViewById(R.id.lbl_json_data);
        mode=getIntent().getIntExtra("mode",0);
        if(mode==1)
            parseJson();
        else
            parseXmlDocument();
    }
    public String parseXmlDocument()
    {
        try
        {
            InputStream is=getAssets().open("input.xml");
            DocumentBuilderFactory
dbFactory=DocumentBuilderFactory.newInstance();
            DocumentBuilder dBuilder;
            dBuilder = dbFactory.newDocumentBuilder();
            Document doc=dBuilder.parse(is);
            Element element=doc.getDocumentElement();
            element.normalize();
            NodeList nList=doc.getElementsByTagName("employee");
            for(int i=0;i<nList.getLength();i++)
            {
                Node node=nList.item(i);
                if(node.getNodeType()==Node.ELEMENT_NODE)
                {
                    Element element2=(Element)node;

lblXmlData.setText("CityName:"+getValue("city_name",element2)+"\n");

lblXmlData.append("Latitude:"+getValue("Latitude",element2)+"\n");

lblXmlData.append("Longitude:"+getValue("Longitude",element2)+"\n");

lblXmlData.append("Temperature:"+getValue("Temperature",element2)+"\n")
;

lblXmlData.append("Humidity:"+getValue("Humidity",element2)+"\n");
                }
            }
        }
```

```java
            catch(Exception e)
            {
                e.printStackTrace();
            } return null;
        }
    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 parseJson()
    {
        try
        {
            InputStream inputStream=getAssets().open("input.json");
            byte[]data=new byte[inputStream.available()];
            inputStream.read(data);
            String readData=new String(data);
            JSONObject jsonObject=new JSONObject(readData);
            JSONObject
jsonObject1=jsonObject.getJSONObject("employee");

lblJsonData.setText("CityName:"+jsonObject1.getString("city_name")+"\n"
);

lblJsonData.append("Latitude:"+jsonObject1.getString("Latitude")+"\n");

lblJsonData.append("Longitude"+jsonObject1.getString("Longitude")+"\n")
;

lblJsonData.append("Temperature:"+jsonObject1.getInt("Temperature")+"\n
");

lblJsonData.append("Humidity"+jsonObject1.getString("Humidity")+"\n");
        }
        catch(Exception e){e.printStackTrace();
        }
    }
}
```

Input.json

```json
{
  "employee": {
    "city_name": "Mysore",
    "Latitude": "12.295",
    "Longitude": "76.639",
    "Temperature": 22,
    "Humidity": "90%"
```

```
    }
}
```

Input.xml

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

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.

MainActivity.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/txt_texttospeak"
    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_marginStart="124dp"
        android:layout_marginTop="72dp"
        android:text="EnterTexttoSpeak"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText
        android:id="@+id/editText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="52dp"
        android:ems="10"
        android:inputType="textPersonName"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.417"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView"
        app:layout_constraintVertical_bias="0.038" />

    <Button
        android:id="@+id/btn_speak"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="68dp"
        android:text="Speak"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.464"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/editText" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```java
package com.example.texttospeech;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.speech.tts.TextToSpeech;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import java.util.Locale;
public class MainActivity extends AppCompatActivity implements
View.OnClickListener{
    EditText txtSpeak;
    Button btnSpeak;
    TextToSpeech textToSpeech;
    @Override
    protected void onCreate(Bundle savedInstanceState){
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        txtSpeak=(EditText)findViewById(R.id.editText);
        btnSpeak=(Button)findViewById(R.id.btn_speak);
        btnSpeak.setOnClickListener(this);
        textToSpeech=new TextToSpeech(getBaseContext(),
                new TextToSpeech.OnInitListener(){
                    @Override
                    public void onInit(int status){
                        if(status!=TextToSpeech.ERROR)
                        {

Toast.makeText(getBaseContext(),"Success",Toast.LENGTH_LONG).show();
                        }
                    }
                });
        textToSpeech.setLanguage(Locale.UK);
    }
    public void onClick(View v)
    {
        String text=txtSpeak.getText().toString();
        textToSpeech.speak(text,TextToSpeech.QUEUE_FLUSH,null);
    }
}
```

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.

MainActivity.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/Button11"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:backgroundTint="#4CAF50"
    tools:context=".MainActivity">
    <Button
        android:id="@+id/button8"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="169dp"
        android:layout_marginBottom="201dp"
        android:backgroundTint="#4CAF50"
        android:onClick="inputNumber"
        android:text="8" />
    <Button
        android:id="@+id/Button10"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="286dp"
        android:layout_marginBottom="115dp"
        android:onClick="inputNumber"
        android:backgroundTint="#4CAF50"
        android:text="*" />
    <Button
        android:id="@+id/saveBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="80dp"
        android:layout_marginBottom="38dp"
        android:backgroundTint="#CDDC39"
        android:text="Save" />
    <Button
```

```xml
        android:id="@+id/callBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="209dp"
        android:layout_marginBottom="35dp"
        android:backgroundTint="#F44336"
        android:text="Call" />
    <Button
        android:id="@+id/clearBtn12"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="159dp"
        android:layout_marginBottom="116dp"
        android:backgroundTint="#4CAF50"
        android:onClick="inputNumber"
        android:text="0" />
    <Button
        android:id="@+id/Button7"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="288dp"
        android:layout_marginBottom="201dp"
        android:onClick="inputNumber"
        android:backgroundTint="#4CAF50"
        android:text="7" />
    <Button
        android:id="@+id/Button9"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="38dp"
        android:layout_marginBottom="201dp"
        android:onClick="inputNumber"
        android:backgroundTint="#4CAF50"
        android:text="9" />
    <EditText
        android:id="@+id/phoneNumberEditText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="172dp"
        android:layout_marginBottom="543dp"
        android:onClick="inputNumber"
```

```xml
        android:ems="10"
        android:hint="Phone Number"
        android:inputType="phone" />
    <Button
        android:id="@+id/clearBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="48dp"
        android:layout_marginBottom="544dp"
        android:backgroundTint="#E91E63"
        android:text="Clear" />
    <Button
        android:id="@+id/Button12"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="38dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="108dp"
        android:backgroundTint="#4CAF50"
        android:text="#" />
    <Button
        android:id="@+id/Button1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="291dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="380dp"
        android:backgroundTint="#4CAF50"
        android:text="1" />
    <Button
        android:id="@+id/Button4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="289dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="296dp"
        android:backgroundTint="#4CAF50"
        android:text="4" />
    <Button
        android:id="@+id/Button5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
```

```xml
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="170dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="295dp"
        android:backgroundTint="#4CAF50"
        android:text="5" />
    <Button
        android:id="@+id/Button6"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="35dp"
        android:layout_marginBottom="290dp"
        android:onClick="inputNumber"
        android:backgroundTint="#4CAF50"
        android:text="6" />
    <Button
        android:id="@+id/Button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="172dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="380dp"
        android:backgroundTint="#4CAF50"
        android:text="2" />
    <Button
        android:id="@+id/Button3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="48dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="380dp"
        android:backgroundTint="#4CAF50"
        android:text="3" />
</RelativeLayout>
```

MainActivity.java

```java
package com.example.myapplication;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.provider.ContactsContract;
```

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

intent.putExtra(ContactsContract.Intents.Insert.PHONE,phoneNumber);
                startActivity(intent);
            }
        });
    }
    public void inputNumber(View v){
        Button btn=(Button)v;
        String digit=btn.getText().toString();
        String phoneNumber=phoneNumberEditText.getText().toString();
        phoneNumberEditText.setText(phoneNumber+digit);
    }
}
```