



**SAHYADRI**

**COLLEGE OF ENGINEERING & MANAGEMENT  
MANGALURU**

(Affiliated to VTU, Belagavi & Approved by AICTE, New Delhi)

**DEPARTMENT OF COMPUTER SCIENCE&ENGINEERING**

**MOBILE APPLICATION  
DEVELOPMENT**

**LABORATORY MANUAL**

**18CSMP68**

**VI Semester - BE**

**Department of Computer Science& Engineering  
SAHYADRI College of Engineering & management Adyar,  
Mangaluru  
575007**

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<b>PART A</b>	
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.
2	Develop an Android application using controls like Button, TextView, EditText for designing a calculator having basic functionality like Addition, Subtraction, Multiplication, and Division.
3	<p>Create a SIGN Up activity with Username and Password. Validation of password should happen based on the following rules:</p> <p>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).</p> <p>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.</p>
4	Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 seconds.
5	Write a program to create an activity with two buttons START and STOP. On pressing of the START button, the activity must start the counter by displaying the numbers from One and the counter must keep on counting until the STOP button is pressed. Display the counter value in a TextView control.
6	Create two files of XML and JSON type with values for City_Name, Latitude, Longitude, Temperature, and Humidity. Develop an application to create an activity with two buttons to parse the XML and JSON files which when clicked should display the data in their respective layouts side by side.
7	Develop a simple application with one EditText so that the user can write some text in it. Create a button called “Convert Text to Speech” that converts the user input text into voice.

1.Create 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. I



## Visiting Card Application

### strings.xml

*[add string.xml in main/res/values]*

```
<resources>
<string name="app_name">Visiting_Card</string>
<string name="employee_name">Nobert</string>
<string name="designation">Application Dev</string>
<string name="phone">9091914689</string>
<string name="email">nobert@tech.com</string>
<string name="address">Bengaluru</string>
</resources>
```

### 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" an-
droid:layout_height="match_parent" an-
droid:orientation="vertical"
tools:context=".MainActivity">

<RelativeLayout
```

```
android:layout_width="match_parent"  
android:layout_height="60dp">
```

```
<TextView  
    android:id="@+id/textView"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:layout_marginTop="10dp"  
    android:gravity="center" an-  
droid:textColor="@color/white" an-  
droid:textSize="25dp"  
    android:text="Global Solutions" />
```

```
<ImageView  
    android:id="@+id/imageView" an-  
droid:layout_width="wrap_content" an-  
droid:layout_height="wrap_content" an-  
droid:layout_marginLeft="250dp"  
    app:srcCompat="@drawable/java" />
```

```
</RelativeLayout>
```

```
<View  
    android:id="@+id/view1"  
    android:layout_width="match_par-  
ent"  
    android:layout_height="1dp"  
    android:background="@color/black"  
    android:layout_weight="0" />
```

```
<TextView  
    android:id="@+id/textView2"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:layout_marginTop="25dp"  
    android:gravity="center"  
    android:textSize="40dp"  
    android:layout_marginBottom="10dp"  
    android:textColor="@color/black"  
    android:text="@string/employee_name"  
/>
```

```
<TextView  
    android:id="@+id/textView3"  
    android:layout_width="match_par-
```

```
ent"  
    android:layout_height="wrap_con-  
tent"  
    android:gravity="center"  
    android:textSize="20dp"  
    android:layout_marginBottom="20dp"  
    android:text="@string/designa-  
tion"/>
```

```
<View  
    android:id="@+id/view2"  
    android:layout_width="match_parent" android:lay-  
out_height="1dp"  
    android:background="@color/black"  
    android:layout_weight="0" />
```

```
<TextView  
    android:id="@+id/textView4"  
    android:layout_width="match_par-  
ent"  
    android:layout_height="wrap_con-  
tent"  
    android:gravity="center"  
    android:layout_marginTop="20dp"  
    android:layout_marginBottom="20dp"  
    android:textSize="20dp"  
    android:text="@string/phone" />
```

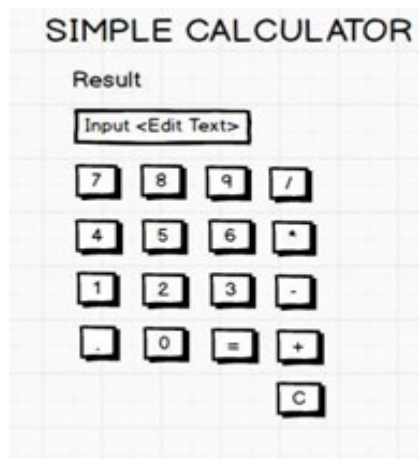
```
<TextView  
    android:id="@+id/textView5"  
    android:layout_width="match_par-  
ent"  
    android:layout_height="wrap_con-  
tent"  
    android:gravity="center"  
    android:layout_marginTop="20dp"  
    android:layout_marginBottom="20dp"  
    android:textSize="20dp"  
    android:text="@string/address" />
```

```
<TextView  
    android:id="@+id/textView6"
```

```
android:layout_width="match_parent" android:layout_height="wrap_content" android:gravity="center" android:layout_marginTop="20dp" android:layout_marginBottom="20dp" android:textSize="20dp" android:text="@string/email" />
```

```
</LinearLayout>
```

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



## Calculator Application

activity\_main.xml

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

ity">

<Button

```
    android:id="@+id/btnDot"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="30dp"
    android:text="."
    app:layout_constraintEnd_toStartOf="@+id/
btn2"
    app:layout_constraintStart_toStartOf="par-
ent"
    app:layout_constraintTop_toBottomOf="@+id/
btn7"/>
```

<Button

```
    android:id="@+id/btn8" android:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content" android:lay-
out_marginTop="23dp"
    android:text="8"
    app:layout_constraintEnd_toStartOf="@+id/
btn3"
    app:layout_constraintStart_toEndOf="@+id/
btn1"
    app:layout_constraintTop_toBottomOf="@+id/
btn5"/>
```

<Button

```
    android:id="@+id/btnDiv"
    android:layout_width="wrap_content"
    android:layout_height="wrap_con-
tent"
    android:layout_marginTop="30dp"
    android:text="/"
    app:layout_constrain-
tEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.466"
    app:layout_constraintStart_toEndOf="@+id/btn3"
    app:layout_constraintTop_toBottomOf="@+id/btnMul" />
```

```
<Button
    android:id="@+id/btnClear" an-
    droid:layout_width="wrap_content"
    android:layout_height="wrap_con-
    tent" android:layout_margin-
    Top="30dp" android:text="C"
    app:layout_constraintEnd_toStartOf="@+id/bt-
    nAdd" app:layout_constraintHorizon-
    tal_bias="0.533" app:layout_con-
    straintStart_toEndOf="@+id/btn2" app:layout_con-
    straintTop_toBottomOf="@+id/btn9" />

<Button
    android:id="@+id/btn9"
    android:layout_width="wrap_content"
    android:layout_height="wrap_con-
    tent"
    android:layout_marginTop="23dp"
    android:text="9"
    app:layout_constraintEnd_toStartOf="@+id/bt-
    nAdd"
    app:layout_constraintHorizontal_bias="0.533"
    app:layout_constraintStart_toEndOf="@+id/btn2"
    app:layout_constraintTop_toBottomOf="@+id/btn6"
    />

<Button
    android:id="@+id/btnMul" android:lay-
    out_width="wrap_content" android:lay-
    out_height="wrap_content" android:lay-
    out_marginTop="23dp" android:text="x"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.466
    " app:layout_constraintStart_toEndOf="@+id/
    btn3"
    app:layout_constraintTop_toBottomOf="@+id/btnSub" />

<Button
    android:id="@+id/btn7"
    android:layout_width="wrap_con-
    tent"
    android:layout_height="wrap_con-
    tent"
    android:layout_marginTop="23dp"
```



```
        android:text="7"
        app:layout_constraintEnd_toStartOf="@+id/btn2"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/btn4"
    />

<Button
    android:id="@+id/btn0" android:lay-
    out_width="wrap_content" android:lay-
    out_height="wrap_content" android:lay-
    out_marginTop="30dp" android:text="0"
    app:layout_constraintEnd_toStartOf="@+id/
    btn3" app:layout_con-
    straintStart_toEndOf="@+id/btn1"
    app:layout_constraintTop_toBottomOf="@+id/btn8" />
```

```
<Button
    android:id="@+id/btn5"
    android:layout_width="wrap_content" android:lay-
    out_height="wrap_content" android:layout_margin-
    Top="30dp"
    android:text="5"
    app:layout_constraintEnd_toStartOf="@+id/
    btn3"
    app:layout_constraintStart_toEndOf="@+id/
    btn1"
    app:lay-
    out_constraint-
    Top_toBottomOf="
    @+id/btn2"/>
```

```
<Button
    android:id="@+id/btn4"
    android:layout_width="wrap_content" android:lay-
out_height="wrap_content" android:layout_margin-
Top="30dp"
    android:text="4"
    app:layout_constraintEnd_toStartOf="@+id/
btn2"
    app:layout_constraintStart_toEndOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/
btn1"/>

<Button
    android:id="@+id/btnSub"
    android:layout_width="wrap_content" android:lay-
out_height="wrap_content" android:layout_margin-
Top="30dp"
    android:text="-"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_con-
straintHorizontal_bias="0.466"
    app:layout_constraintStart_toEndOf="@+id/btn3"
    app:layout_constraintTop_toBottomOf="@+id/btnAdd" />

<Button
    android:id="@+id/btn6"
    android:layout_width="wrap_content" android:lay-
out_height="wrap_content" android:layout_margin-
Top="30dp"
    android:text="6"
    app:layout_constraintEnd_toStartOf="@+id/bt-
nAdd"
    app:layout_con-
straintHorizontal_bias="0.533"
    app:layout_constraintStart_toEndOf="@+id/btn2"
    app:layout_constraintTop_toBottomOf="@+id/btn3" />

<Button
    android:id="@+id/btn3"
    android:layout_width="wrap_con-
tent"
    android:layout_height="wrap_con-
```

```
tent"
    android:layout_marginTop="83dp"
    android:text="3"
    app:layout_constraintEnd_toStartOf="@+id/btnAdd"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/btn2"
    app:layout_constraintTop_toBottomOf="@+id/display" />

<Button
    android:id="@+id/btn1" android:lay-
    out_width="wrap_content" android:lay-
    out_height="wrap_content" android:lay-
    out_marginTop="83dp" android:text="1"
    app:layout_constraintEnd_toStartOf="@+id/
    btn2" app:layout_constraintHorizon-
    tal_bias="0.5" app:layout_con-
    straintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/display" />

<Button
    android:id="@+id/btn2"
    android:layout_width="wrap_con-
    tent"
    android:layout_height="wrap_con-
    tent"
    android:layout_marginTop="83dp"
    android:text="2" app:layout_constrain-
    tEnd_toStartOf="@+id/btn3" app:layout_con-
    straintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/btn
    1"
    app:layout_constraintTop_toBottomOf="@+id/display" />

<Button
    android:id="@+id/btnAdd"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="83dp" an-
    droid:text="+"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/
    btn3"
```

```
app:layout_constraintTop_toBottomOf="@+id/display" />
```

<Button

```
    android:id="@+id/btnEqual" android:lay-  
out_width="wrap_content" android:lay-  
out_height="wrap_content" android:lay-  
out_marginEnd="164dp" android:lay-  
out_marginLeft="154dp" android:lay-  
out_marginRight="164dp" android:layout_mar-  
ginStart="154dp" android:layout_margin-  
Top="28dp" android:text="=" app:layout_con-  
straintEnd_toEndOf="parent" app:layout_con-  
straintStart_toStartOf="parent"
```

```
app:layout_constraintTop_toBottomOf="@+id/btnClear" />
```

<EditText

```
    android:id="@+id/display" an-  
droid:layout_width="wrap_content"  
android:layout_height="wrap_con-  
tent" android:lay-  
out_marginEnd="89dp" android:lay-  
out_marginLeft="112dp" android:lay-  
out_marginRight="89dp" android:lay-  
out_marginStart="112dp" an-  
droid:layout_marginTop="40dp" an-  
droid:ems="10"  
android:hint="Your Values Goes Here"  
android:inputType="text"  
android:textDirection="ltr"  
app:layout_constraintEnd_toEndOf="parent"  
app:layout_constraintStart_toStartOf="parent"
```

```
    app:layout_constraintTop_toBottomOf="@+id/  
textView" />
```

<TextView

```
    android:id="@+id/textView" android:lay-  
out_width="wrap_content" android:lay-  
out_height="wrap_content" android:lay-  
out_marginEnd="178dp" android:lay-  
out_marginLeft="175dp" android:lay-  
out_marginRight="178dp" android:layout_mar-  
ginStart="175dp" android:layout_margin-
```

```
Top="36dp" android:text="Calculator" an-  
droid:textSize="30dp" app:layout_constrain-  
tEnd_toEndOf="parent" app:layout_con-  
straintHorizontal_bias="0.487" app:lay-  
out_constraintStart_toStartOf="parent"  
app:layout_constraintTop_toTopOf="parent"  
/>  
</androidx.constraintlayout.widget.ConstraintLayout>
```

### MainActivity.java

```
package com.example.calculator;

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;
import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity {
    Button btn0,btn1,btn2,btn3,btn4,btn5,btn6,btn7,btn8,btn9;
    Button btnAdd,btnSub,btnMul,btnDiv,btnEqual,btnDot,btnClear;
    EditText display;

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

    btn1 = (Button)findViewById(R.id.btn1);
    btn2 = (Button)findViewById(R.id.btn2);
    btn3 = (Button)findViewById(R.id.btn3);
    btn4 = (Button)findViewById(R.id.btn4);
    btn5 = (Button)findViewById(R.id.btn5);
    btn6 = (Button)findViewById(R.id.btn6);
    btn7 = (Button)findViewById(R.id.btn7);
    btn8 = (Button)findViewById(R.id.btn8);
    btn9 = (Button)findViewById(R.id.btn9);
    btn0 = (Button)findViewById(R.id.btn0);

    btnAdd =(Button)findViewById(R.id.btnAdd);
    btnSub =(Button)findViewById(R.id.btnSub);
    btnMul =(Button)findViewById(R.id.btnMul);
    btnDiv =(Button)findViewById(R.id.btnDiv);

    btnDot =(Button)findViewById(R.id.btnDot);
    btnEqual=(Button)findViewById(R.id.btnEqual);
```

```
btnClear=(Button)findViewById(R.id.btnClear);

display =(EditText)findViewById(R.id.display);

btn1.setOnClickListener(new      View.OnClickListener()

tener()

@Override

    public void onClick(View v) {

        display.append("1");
    }
});
btn2.setOnClickListener(new View.OnClickListener() {
@Override
    public void onClick(View v) {

        display.append("2");
    }
});
btn3.setOnClickListener(new View.OnClickListener() {
@Override
    public void onClick(View v) {
        display.append("3");
    }
});

btn4.setOnClickListener(new View.OnClickListener() {
@Override
    public void onClick(View v) {
        display.append("4");
    }
});

btn5.setOnClickListener(new View.OnClickListener() {
@Override
    public void onClick(View v) {
        display.append("5");
    }
});
```

```
btn6.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            display.append("6");  
        }  
});
```

```
btn7.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            display.append("7");  
        }  
});
```

```
btn8.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            display.append("8");  
        }  
});
```

```
btn9.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            display.append("9");  
        }  
});
```

```
btn0.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            display.append("0");  
        }  
});
```

```
btnAdd.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            display.append("+");  
        }  
});
```



```
}  
});
```

```
btnSub.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            display.append("-");  
        }  
});
```

```
btnMul.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            display.append("x");  
        }  
});
```

```
btnDiv.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            display.append("/");  
        }  
});
```

```
btnDot.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            display.append(".");  
        }  
});
```

```
btnClear.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            display.setText("");  
        }  
});
```

```
btnEqual.setOnClickListener(new View.OnClickListener() {  
    @Override  
        public void onClick(View v) {  
            String data = display.getText().toString();
```

```
        if(data.contains("-")){
            String operands[] = data.split("-");
            double op1 = Double.parseDouble(operands[0]);
            double op2 = Double.parseDouble(operands[1]);

            double res = op1-op2; display.setText(String.val-
ueOf(res));}

        if(data.contains("x")){
            String operands[] = data.split("x");
            double op1 = Double.parseDouble(operands[0]);
            double op2 = Double.parseDouble(operands[1]);
            double res = op1*op2;
            display.setText(String.valueOf(res));
        }
        if(data.contains("/")){

            String operands[] = data.split("/");
            double op1 = Double.parseDouble(operands[0]);
            double op2 = Double.parseDouble(operands[1]);

            if(op2==0){
                Toast.makeText(MainActivity.this,
                "Divide by zero is not possible",
                Toast.LENGTH_SHORT).show();
            }
            double res = op1/op2;
            display.setText(String.valueOf(res));
        }

        if(data.contains("+")){

            String operands[] =data.split(Pattern.quote("+"));
            double op1 = Double.parseDouble(operands[0]);
            double op2 = Double.parseDouble(operands[1]);
            double res = op1+op2;
            display.setText(String.valueOf(res));

        }
    }
}
});
}
```

}

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

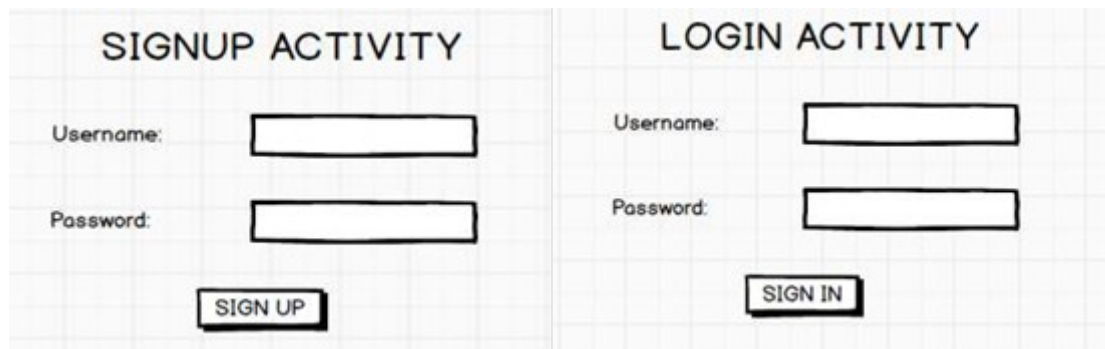
Password should contain uppercase and lowercase letters.

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.



## Sign Up Sign In Application

### activity\_main.xml

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

<EditText
    android:id="@+id/username" android:layout_width="wrap_content"
    android:layout_height="wrap_content"
```

```
        android:ems="10" android:inputType="textPerson-
Name"
        android:hint="UserName"
        app:layout_constraintBottom_toBottomOf="par-
ent"
        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:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content" android:ems="10" an-
droid:inputType="textPassword" an-
droid:hint="Password" app:layout_constraintBot-
tom_toBottomOf="parent" app:layout_constraint-
End_toEndOf="parent" app:layout_constraintHor-
izontal_bias="0.497" app:layout_con-
straintStart_toStartOf="parent" app:layout_con-
straintTop_toTopOf="parent" />
<Button
        android:id="@+id/signup"
        android:layout_width="wrap_content" android:lay-
out_height="wrap_content" android:text="Sign Up" app:lay-
out_constraintBottom_toBottomOf="parent" app:layout_con-
straintEnd_toEndOf="parent" app:layout_con-
straintStart_toStartOf="parent" app:layout_constraint-
Top_toTopOf="parent" app:layout_constraintVerti-
cal_bias="0.717" />
<TextView
        android:id="@+id/textView" android:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content" android:text="SignUp
Page"
        android:textSize="30dp" an-
droid:textColor="@color/white" app:layout_con-
straintBottom_toBottomOf="parent" app:lay-
out_constraintEnd_toEndOf="parent" app:lay-
out_constraintHorizontal_bias="0.498" app:lay-
out_constraintStart_toStartOf="parent" app:lay-
out_constraintTop_toTopOf="parent" app:lay-
```

```
        out_constraintVertical_bias="0.11" />  
</androidx.constraintlayout.widget.ConstraintLayout>
```

### activity\_sign\_in.xml

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

#### <TextView

```
    android:id="@+id/textView2" android:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content"
    android:text="Sign In Page"
    android:textSize="30dp" an-
droid:textColor="@color/white" app:layout_con-
straintBottom_toBottomOf="parent" app:lay-
out_constraintEnd_toEndOf="parent" app:lay-
out_constraintHorizontal_bias="0.498" app:lay-
out_constraintStart_toStartOf="parent" app:lay-
out_constraintTop_toTopOf="parent" app:lay-
out_constraintVertical_bias="0.143" />
```

#### <EditText

```
    android:id="@+id/username" android:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content" android:ems="10" an-
droid:inputType="textPersonName" an-
droid:hint="UserName" app:layout_constraintBot-
tom_toBottomOf="parent" app:layout_constraint-
End_toEndOf="parent" app:layout_constraintHori-
zontal_bias="0.497" app:layout_con-
straintStart_toStartOf="parent" app:layout_con-
straintTop_toTopOf="parent" app:layout_con-
straintVertical_bias="0.38" />
```

#### <EditText

```
    android:id="@+id/password" android:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content" android:ems="10" an-
droid:inputType="textPassword" an-
droid: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:lay-  
out_width="wrap_content" android:lay-  
out_height="wrap_content" android:text="Sign  
In" app:layout_constraintBottom_toBot-  
tomOf="parent" app:layout_constraint-  
tEnd_toEndOf="parent" app:layout_con-  
straintStart_toStartOf="parent" app:layout_con-  
straintTop_toTopOf="parent" app:layout_con-  
straintVertical_bias="0.8" />  
</androidx.constraintlayout.widget.ConstraintLayout
```

### MainActivity.- java

```
package com.example.login;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.content.Intent;  
import android.os.Bundle;  
import android.service.autofill.FieldClassification;  
import android.view.View; im-  
port android.widget.Button;  
import android.widget.Edit-  
Text; import android.wid-  
get.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,SignIn.class);  
            intent.putExtras(bundle); startActivity(intent);
```

```
        }
```

```
    }else{
```

```
        Toast.makeText(MainActivity.this, "InvaildPassword",  
            Toast.LENGTH_SHORT).show();  
    }
```

```
}
```

```
});
```

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

```
    return matcher.matches();
```

}

}

## SignIn.java

```
package com.example.login;

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 SignIn extends AppCompatActivity {

    EditText username,password;
    Button signInBtn;

    int count=0;

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

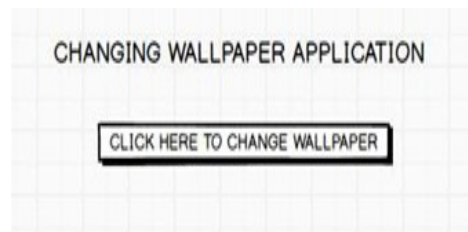
    username = findViewById(R.id.username);
    password= findViewById(R.id.password);
    signInBtn = findViewById(R.id.signin);
    Bundle bundle = getIntent().getExtras();
    String      uname      =      bundle.get-
    String("username");
    String pwd = bundle.getString("password");

    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(SignIn.this, "Success",
    Toast.LENGTH_SHORT).show();
    }
    else {
    count++;
    }
```

```
if (count >= 3) {  
    signInBtn.setEnabled(false);  
}  
  
else {  
    Toast.makeText(SignIn.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.



## Wallpaper Changing Application

### AndroidManifest.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">
    </uses-permission>

    <application
        android:allowBackup="true" android:icon="@mipmap/ic_launcher" android:label="@string/app_name" android:roundIcon="@mipmap/ic_launcher_round" android:supportRtl="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>
```

### 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" an-
droid:layout_width="match_parent" android:lay-
out_height="match_parent" android:gravity="center"
tools:context=".MainActivity">

<Button
    android:id="@+id/btn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="Change Wallpaper" />
</LinearLayout>
```

### MainActivity.java

```
package com.example.wallpaper;

import androidx.appcompat.app.AppCompatActivity;

import android.app.WallpaperManager;
import android.graphics.BitmapFac-
tory; import android.os.Bundle;
import android.view.View;
import android.widget.Button;

import java.io.IOException;
import java.util.Timer; im-
port java.util.TimerTask;

public class MainActivity extends AppCompatActivity {
```

```
int images[] = new int[]{ R.-
drawable.i1, R.drawable.i2,
R.drawable.i3
};

Button btn;
int i=0;

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

btn = findViewById(R.id.btn);

btn.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {

                30000);
                new Timer().schedule(new ChangeWallpaper(),0,

            }
        });

    }

    class ChangeWallpaper extends TimerTask{
    @Override
    public void run() {

        WallpaperManager wallpaperManager = Wallpa-
perManager.getInstance(getBaseContext());

        try {wallpaperManager.setBitmap(

        BitmapFactory.decodeResource(getResources(),images[i]));
        i++;

        if(i==3){
        i=0;
        }

        } catch (IOException e) {
        e.printStackTrace();
        }
        }
        }
    }
```

}



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.



## Counter Application

### activity\_main.xml

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

    <TextView
        android:id="@+id/counterValue" android:layout_width="wrap_content" android:layout_height="wrap_content"
        android:hint="Counter Value" android:textSize="40dp" android:gravity="center"
        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="0.334" />
```



#### <Button

```
android:id="@+id/startBtn" android:lay-
out_width="wrap_content"
android:layout_height="wrap_content" an-
droid:text="Start" app:layout_constraintBot-
tom_toBottomOf="parent" app:layout_constrain-
tEnd_toEndOf="parent" app:layout_con-
straintStart_toStartOf="parent" app:lay-
out_constraintTop_toTopOf="parent" app:lay-
out_constraintVertical_bias="0.645" />
```

#### <Button

```
android:id="@+id/stopBtn" android:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content" android:text="Stop"
app:layout_constraintBottom_toBottomOf="par-
ent" app:layout_constraint-
tEnd_toEndOf="parent" app:layout_con-
straintStart_toStartOf="parent" app:lay-
out_constraintTop_toTopOf="parent" app:lay-
out_constraintVertical_bias="0.781" />
```

#### <Switch

```
android:id="@+id/switch1" android:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content" android:layout_margin-
Bottom="62dp" android:layout_marginEnd="177dp"
android:layout_marginLeft="146dp" android:lay-
out_marginRight="177dp" android:layout_margin-
Start="146dp" android:layout_marginTop="95dp" an-
droid:text="Switch" app:layout_constraintBot-
tom_toTopOf="@+id/startBtn" app:layout_constraint-
tEnd_toEndOf="parent" app:layout_con-
straintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/counterValue"
/>
```

```
<TextView
    android:id="@+id/textView2" an-
    droid:layout_width="wrap_content"
    android:layout_height="wrap_con-
    tent" android:layout_marginBot-
    tom="96dp" android:lay-
    out_marginEnd="61dp" android:lay-
    out_marginLeft="85dp" android:lay-
    out_marginRight="61dp" android:lay-
    out_marginStart="85dp" android:lay-
    out_marginTop="102dp" an-
    droid:text="Counter Application" an-
    droid:textSize="30dp"
    app:layout_constraintBottom_toTopOf="@+id/counterValue"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="par-
    ent"
    app:layout_constraintTop_toTopOf="parent" />

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

### MainActivity.java

```
package com.example.counter;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.os.Handler;
import android.util.Log; im-
port android.view.View; im-
port android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
    private static final String TAG = "thread";

    Handler mainHandler = new Handler();

    int count=0;

    boolean running = false;
```

```
Button startBtn,stopBtn;
TextView counterVal;

void startThread(){
    NewThread nObj = new NewThread();
    nObj.start();
}

@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);

    setContentView(R.layout.activity_main);
    counterVal = findViewById(R.id.counterValue);

    startBtn = findViewById(R.id.startBtn);
    stopBtn = findViewById(R.id.stopBtn);
    startBtn.setOnClickListener(new View.OnClickListener() {

        @Override
        public void onClick(View v) {
            count=0;
            running=true;
            startThread();
        }
    });

    stopBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {

            running=false;
        }
    });

}
class NewThread extends Thread{
    @Override
    public void run() {

        while(running){

            count
            ++;
            mainHandler.post(new Runnable() {
```

```
@Override
public void run() {

    counterVal.setText(String.valueOf(count));

}
});

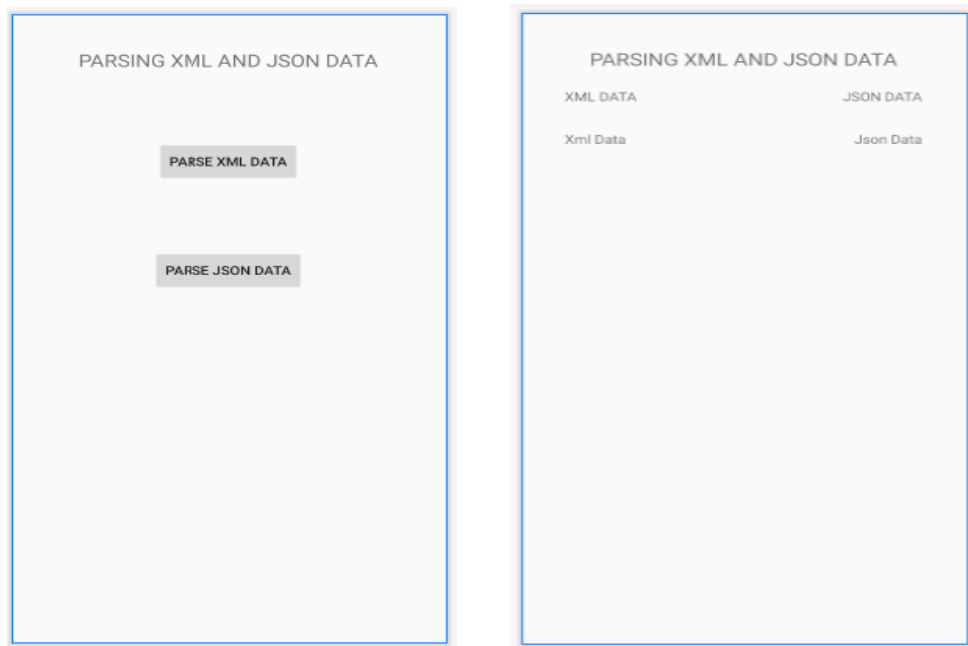
try { Thread.sleep(1000);

} catch (InterruptedException e) {
e.printStackTrace();
}
}
}
}
```

6.Create two files of XML and JSON type with values for City\_Name, Latitude, Longi-

tude, 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



### input.json

```
{
  "City": {
    "City-Name": "Ben-
galuru", "Longitude":
"78", "Latitude":
"13", "Temperature":
"30",
    "Humidity": "90%"
  }
}
```

### in- put.xml

```
<?xml version="1.0" ?>

<Records>
  <City
    id="1">
    <City-Name>Mangaluru</City-Name>
    <Longitude>78</Longitude>

    <Latitude>13</Latitude>
    <Temperature>30</Temperature>
```

```
        <Humidity>90%</Humidity>
    </City>
</Records>
```

**activity\_main.xml**

1

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/an-
droid"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/
tools" android:lay-
out_width="match_parent" android:lay-
out_height="match_parent" tools:con-
text=".MainActivity">

    <Button
        android:id="@+id/xmlBtn" android:lay-
        out_width="wrap_content" android:lay-
        out_height="wrap_content" an-
        droid:text="Parse XML" app:lay-
        out_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.49
8" app:lay-
        out_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.414"
        />

    <Button
        android:id="@+id/jsonBtn" android:lay-
        out_width="wrap_content" android:lay-
        out_height="wrap_content" an-
        droid:text="Parse JSON" app:lay-
        out_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.49
8" app:lay-
        out_constraintStart_toStartOf="parent"
```



```
        app:layout_constraintTop_toTopOf="parent" app:layout_constraintVertical_bias="0.664" />

<TextView
    android:id="@+id/textView" android:layout_width="wrap_content" android:layout_height="wrap_content" android:layout_marginBottom="144dp" android:layout_marginEnd="175dp" android:layout_marginLeft="177dp" android:layout_marginRight="175dp" android:layout_marginStart="177dp" android:layout_marginTop="120dp" android:text="Parse your Data" android:textSize="30dp" app:layout_constraintBottom_toTopOf="@+id/xmlBtn" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintStart_toStartOf="parent" app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

#### activity\_view.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:text=".ViewActivity">

    <TextView android:id="@+id/xmlPlaceHolder" android:layout_width="wrap_content" android:layout_height="wrap_content" android:text="XML data" android:textSize="20dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal-
```

```
tal_bias="0.498"  
    app:lay-  
out_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toTopOf="par-  
ent" app:layout_constraintVerti-  
cal_bias="0.518" />
```

<TextView

```
    android:id="@+id/jsonPlace-  
Holder" android:lay-  
out_width="wrap_content" an-  
droid:layout_height="wrap_con-  
tent" android:text="JSON data"  
  
    android:textSize="20dp" app:lay-  
  
out_constraintBottom_toBottomOf="parent"  
app:layout_constraintEnd_toEndOf="parent"  
app:layout_constraintHorizontal_bias="0.  
498" app:lay-  
out_constraintStart_toStartOf="parent"  
app:layout_constraintTop_toTopOf="par-  
ent" app:layout_constraintVerti-  
cal_bias="0.518" />
```

<TextView

```
    android:id="@+id/xmlHeading" android:lay-  
out_width="wrap_content" android:lay-  
out_height="wrap_content" android:text="XML  
Data" android:textColor="@color/teal_200" an-  
droid:textSize="30dp" app:layout_constraint-  
Bottom_toBottomOf="parent" app:lay-  
out_constraintEnd_toEndOf="parent" app:lay-  
out_constraintStart_toStartOf="parent"  
app:layout_constraintTop_toTopOf="parent"  
app:layout_constraintVertical_bias="0.24" />
```

<TextView

```
    android:id="@+id/jsonHeading" an-  
droid:layout_width="wrap_content"  
android:layout_height="wrap_con-  
tent" android:text="JSON Data" an-  
droid:textColor="@color/teal_200"  
android:textSize="30dp"
```

```
app:layout_constraintStart_toStartOf="parent" app:layout_constraintTop_toTopOf="parent" app:layout_constraintVertical_bias="0.24" />
```

```
<TextView
    android:id="@+id/textView2" android:layout_width="wrap_content" android:layout_height="wrap_content" android:text="Parsed Data" android:textSize="30dp" app:layout_constraintBottom_toBottomOf="parent" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintStart_toStartOf="parent" app:layout_constraintTop_toTopOf="parent" app:layout_constraintVertical_bias="0.089" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

### MainActivity.java

```
package com.example.dataparse;
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 {
    Button xmlBtn,jsonBtn;

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

        xmlBtn = findViewById(R.id.xmlBtn);
        jsonBtn = findViewById(R.id.jsonBtn);

        xmlBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) { Intent intent =
```

```
        new
Intent(MainActivity.this,ViewActivity.class);
        intent.putExtra("mode",1);
        startActivity(intent);
    }
});

jsonBtn.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View
        v) { Intent intent =
        new
Intent(MainActivity.this,ViewActivity.class);
        intent.putExtra("mode",2);
        startActivity(intent);
    }
}
}
```

### ViewActivity.java

```
package com.example.dataparse;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.util.Log;
import android.widget.TextView;

import org.json.JSONException;
import org.json.JSONObject;
import org.w3c.dom.Document;
import org.w3c.dom.Element;
import org.w3c.dom.Node;
import org.w3c.dom.NodeList;
import 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 ViewActivity extends AppCompatActivity {

    int mode;
    TextView xmlPlaceholder, jsonPlaceholder, xmlHeading, json-
    Heading;

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

        mode = getIntent().getIntExtra("mode", 0);

        xmlPlaceholder = findViewById(R.id.xmlPlaceholder);
        jsonPlaceholder = findViewById(R.id.jsonPlaceholder);
        xmlHeading = findViewById(R.id.xmlHeading); jsonHeading
        = findViewById(R.id.jsonHeading);

        if(mode==1){
            parseXML();
        }

        if(mode==2){
            parseJSON();
        }

        // read the file --> inputStream

        // array = inputStream

        // String(array)

        public void parseJSON(){

            xmlPlaceholder.setText("");
            xmlHeading.setText("");

            String stringData=null; try {

            InputStream inputStream =
```

```
getAssets().open("input.json");

int size = inputStream.available();

byte buffer[] = new byte[size]; in-

putStream.read(buffer);

stringData = new String(buffer);

Log.e("data", "parseJSON: "+stringData );

JSONObject jsonObject = new JSONOb-

ject(stringData);

Log.e("data", "parseJSON: "+(jsonObject));

Log.e("data", "parseJSON:

"+jsonObject.getClass().getName());

JSONObject cityObject =

jsonObject.getJSONObject("City");

String cityName = cityObject.getString("City-Name");
String longitude = cityObject.getString("Longitude");
String latitude = cityObject.getString("Latitude");
String temperature =cityObject.getString("Temperature");
String humidity = cityObject.getString("Humidity");
Log.e("data", "parseJSON: "+ cityName );
jsonPlaceholder.setText("City-Name - "+cityName+"\n\n");
jsonPlaceholder.append("Longitude - "+longitude+"\n\n");
jsonPlaceholder.append("Latitude - "+latitude+"\n\n");
jsonPlaceholder.append("Temperature - "+temperature+"\n\n");
jsonPlaceholder.append("Humidity - "+humidity+"\n\n");

}
catch (IOException e) {
e.printStackTrace();
} catch (JSONException e) {
e.printStackTrace();
}
}
```

```
public void parseXML(){ xmlPlace-

Holder.setText(" ");

jsonPlaceholder.setText(" ");

jsonHeading.setText(" ");


try {
InputStream inputStream =
getAssets().open("input.xml");

DocumentBuilderFactory documentBuilderFactory = Doc-
umentBuilderFactory.newInstance();

DocumentBuilder documentBuilder =
documentBuilderFactory.newDocument-

Builder(); Document document =

documentBuilder.parse(inputStream);

NodeList cityList =
document.getElementsByTagName("City");

for(int i=0; i<cityList.getLength();i++){

    Node c = cityList.item(i);

    if(c.getNodeType() == Node.ELEMENT_NODE){
        Element city = (Element) c;

        // String id = city.getAttribute("id");
        // Log.e("data", "parseXML: "+id );

        NodeList cityDetailList =
        city.getChildNodes();

        for(int j=0;j<cityDetailList.getLength();j+

        +) { Node n = cityDetailList.item(j);

        if (n.getNodeType() == Node.ELEMENT_NODE)
        {
            Element cityDetail = (Element) n;
```

```
String tagValue = cityDetail.getTagNames();
String value = cityDetail.getTextContent();

Log.e("data", "parseXML: " + value);

xmlPlaceholder.append(tagValue + " - "+value + "\n");
xmlPlaceholder.append("\n");

}
}
}
}

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



. 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



**activity\_main.xml**

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/
android"
    xmlns:app="http://schemas.android.com/apk/
res-auto" xmlns:tools="http://schemas.an-
droid.com/tools" android:lay-
out_width="match_parent" android:lay-
out_height="match_parent" tools:con-
text=".MainActivity">

    <EditText
        android:id="@+id/enteredValue" an-
droid:layout_width="wrap_content" an-
droid:layout_height="wrap_content" an-
droid:ems="10" android:inputType="textPer-
sonName" android:hint="Enter your Text"
app:layout_constraintBottom_toBottomOf="p
arent" app:layout_constraint-
tEnd_toEndOf="parent" app:lay-
out_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.223
" />

    <Button
        android:id="@+id/speakBtn" android:lay-
out_width="wrap_content" android:lay-
```

```
        out_height="wrap_content" android:text="Speak" 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="0.693" />
    </androidx.constraintlayout.widget.ConstraintLayout>
```

### MainActivity.java

```
package com.example.texttospeech;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.speech.tts.TextToSpeech;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;

import java.util.Locale;

public class MainActivity extends AppCompatActivity {

    EditText enteredValue;
    Button speakBtn; TextToSpeech textToSpeech;

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

```
speakBtn = findViewById(R.id.speakBtn);
enteredValue = findViewById(R.id.enteredValue);

textToSpeech = new TextToSpeech(MainActivity.this,
new
TextToSpeech.OnInitListener() {
    @Override
    public void onInit(int status)
    {

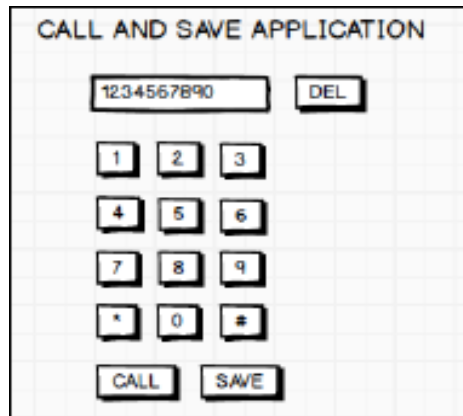
        if(status == TextToSpeech.SUCCESS){
            textToSpeech.setLanguage(Locale.ENGLISH);
        }
        else{
            Log.e("failed", "onInit: Failed");
        }
    }
});

speakBtn.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {

        String text = enteredValue.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.



activity\_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.Constraint-
Layout 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:lay-
out_width="match_parent" android:lay-
out_height="match_parent" tools:con-
text=".MainActivity">
```

```
<Button
    android:id="@+id/btnSave" android:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content" android:lay-
out_marginTop="16dp" android:text="Save"
app:layout_constraintEnd_toStartOf="@+id/bt-
nCall"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/
btnStar" />
```

```
<Button
    android:id="@+id/btnCall" an-
    droid:layout_width="wrap_content"
    android:layout_height="wrap_con-
    tent" android:layout_margin-
    Top="16dp" android:text="Call"
    app:layout_constraintEnd_toStartOf="@+id/btnRe-
    move" app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/
    btnSave" app:layout_constraintTop_toBotto-
    mOf="@+id/btn0" />

<Button
    android:id="@+id/btnRemove" android:lay-
    out_width="wrap_content" android:lay-
    out_height="wrap_content" android:lay-
    out_marginTop="16dp" android:text="X"
    app:layout_constraintEnd_toEndOf="par-
    ent" app:layout_constraintHorizon-
    tal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/btnCall"
    app:layout_constraintTop_toBottomOf="@+id/btnHash"
    />

<Button
    android:id="@+id/btnStar" android:lay-
    out_width="wrap_content" android:lay-
    out_height="wrap_content" android:lay-
    out_marginTop="20dp" android:text="*"
    app:layout_constraintEnd_toStartOf="@+id/
    btn0" app:layout_constraintHorizon-
    tal_bias="0.5" app:lay-
    out_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/btn7" />

<Button
    android:id="@+id/btn0" android:lay-
    out_width="wrap_content" an-
    droid:layout_height="wrap_content"
```

```
android:layout_marginTop="20dp" an-  
droid:text="0"  
app:layout_constraintEnd_toStartOf="@+id/  
btnHash" app:layout_constraintHorizon-  
tal_bias="0.5" app:lay-  
out_constraintStart_toEndOf="@+id/btnStar"  
app:layout_constraintTop_toBottomOf="@+id/btn8"  
/>
```

<Button

```
android:id="@+id/btnHash" android:lay-  
out_width="wrap_content" android:lay-  
out_height="wrap_content" android:lay-  
out_marginTop="20dp" android:text="#"  
app:layout_constraintEnd_toEndOf="parent"  
app:layout_constraintHorizontal_bias="0.5"  
app:layout_constraintStart_toEndOf="@+id/  
btn0"  
app:layout_constraintTop_toBottomOf="@+id/btn9" />
```

<Button

```
android:id="@+id/btn7" android:lay-  
out_width="wrap_content" android:lay-  
out_height="wrap_content" android:lay-  
out_marginTop="27dp" android:text="7"  
app:layout_constraintEnd_toStartOf="@+id/  
btn8" app:layout_constraintHorizon-  
tal_bias="0.5" app:lay-  
out_constraintStart_toStartOf="parent"  
app:layout_constraintTop_toBottomOf="@+id/btn4" />
```

<Button

```
android:id="@+id/btn8" android:lay-  
out_width="wrap_content" android:lay-  
out_height="wrap_content" android:lay-  
out_marginTop="27dp" android:text="8"  
app:layout_constraintEnd_toStartOf="@+id/  
btn9" app:layout_constraintHorizon-  
tal_bias="0.5" app:lay-  
out_constraintStart_toEndOf="@+id/btn7"  
app:layout_constraintTop_toBottomOf="@+id/btn5" />
```

```
<Button
    android:id="@+id/btn9" android:lay-
out_width="wrap_content" an-
droid:layout_height="wrap_content"
    android:layout_marginTop="27dp"
    android:text="9"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/btn8"
    app:layout_constraintTop_toBottomOf="@+id/
btn6" />

<Button
    android:id="@+id/btn4" android:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content" android:lay-
out_marginTop="28dp" android:text="4"
    app:layout_constraintEnd_toStartOf="@+id/
btn5" app:layout_constraintHorizon-
tal_bias="0.5" app:lay-
out_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/btn1" />

<Button
    android:id="@+id/btn5" android:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content" android:lay-
out_marginTop="28dp" android:text="5"
    app:layout_constraintEnd_toStartOf="@+id/
btn6" app:layout_constraintHorizon-
tal_bias="0.5" app:lay-
out_constraintStart_toEndOf="@+id/btn4"
    app:layout_constraintTop_toBottomOf="@+id/btn2" />

<Button
    android:id="@+id/btn6" android:lay-
out_width="wrap_content" android:lay-
out_height="wrap_content" android:lay-
out_marginTop="28dp" android:text="6"
    app:layout_constraintEnd_toEndOf="parent"
```

```
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toEndOf="@+id/
        btn5"
        app:layout_constraintTop_toBottomOf="@+id/btn3" />

<Button android:id="@+id/
        btn2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="108dp"
        android:text="2"
        app:layout_constraintEnd_toStartOf="@+id/
btn3"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toEndOf="@+id/
btn1"
        app:layout_constraintTop_toBottomOf="@+id/display" />

<Button
        android:id="@+id/btn3" android:lay-
        out_width="wrap_content" android:lay-
        out_height="wrap_content" android:lay-
        out_marginTop="108dp" android:text="3"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toEndOf="@+id/
        btn2"
        app:layout_constraintTop_toBottomOf="@+id/display" />

<Button
        android:id="@+id/btn1" android:lay-
        out_width="wrap_content" android:lay-
        out_height="wrap_content" android:lay-
        out_marginTop="108dp" android:text="1"
        app:layout_constraintEnd_toStartOf="@+id/
        btn2" app:layout_constraintHorizon-
        tal_bias="0.5" app:lay-
        out_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/display" />
```



```
<EditText
    android:id="@+id/display" an-
    droid:layout_width="wrap_content"
    android:layout_height="wrap_con
    tent" android:ems="10" android:in-
    putType="phone"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="par-
    ent" app:layout_constraintTop_toTopOf="par-
    ent"
    app:layout_constraintVertical_bias="0.195"
/>

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

### MainActivity.java

```
package com.example.phonedailer;

import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.provider.ContactsContract;
import android.view.View; import android.widget.Button;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity {

    EditText display;

    Button btn1,btn2, btn3,btn4, btn5,btn6, btn7,btn8,
```

```
btn9,btn0; Button btnCall,btnSave,btnStar,btnHash,btnRemove;
```

```
@Override
```

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

```
    btn0 =  
    findViewById(R.id.btn0); btn1  
    = findViewById(R.id.btn1);  
    btn2 =  
    findViewById(R.id.btn2); btn3  
    = findViewById(R.id.btn3);  
    btn4 =  
    findViewById(R.id.btn4); btn6  
    = findViewById(R.id.btn6);  
    btn7 =  
    findViewById(R.id.btn7); btn8  
    = findViewById(R.id.btn8);  
    btn9 =  
    findViewById(R.id.btn9);
```

```
    btnCall = findViewById(R.id.btnCall);  
    btnSave = findViewById(R.id.btnSave);  
    btnRemove = findViewById(R.id.btnRemove);  
    btnStar = findViewById(R.id.btnStar);  
    btnHash = findViewById(R.id.btnHash);
```

```
    display = findViewById(R.id.display);
```

```
    btn0.setOnClickListener(new View.OnClickListener() {  
        @Override  
        public void onClick(View v)  
        {  
            display.append("0");  
        }  
    });
```

```
    btn1.setOnClickListener(new View.OnClickListener() {  
        @Override
```

```
        public void onClick(View v) {
            display.append("1");
        }
    });

    btn2.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("2");
        }
    });
    btn5 = findViewById(R.id.btn5);

    btn3.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("3");
        }
    });

    btn4.setOnClickListener(new View.OnClickListener() {

        @Override
        public void onClick(View v) {
            display.append("4");
        }
    });

    btn5.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("5");
        }
    });

    btn6.setOnClickListener(new View.OnClickListener() {
        @Override
```

```
        public void onClick(View v) {
            display.append("6");
        }
    });

    btn7.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("7");
        }
    });

    btn8.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("8");
        }
    });

    btn9.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("9");
        }
    });

    btnStar.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("*");
        }
    });

    btnHash.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("#");
        }
    });
```

```
    }  
});  
  
btnCall.setOnClickListener(new View.OnClickListener()  
{  
    @Override  
    public void onClick(View v) {  
  
        String data = display.getText().toString(); Intent intent = new Intent(Intent.ACTION_DIAL); intent.setData(Uri.parse("tel:"+data));  
  
        startActivity(intent);  
  
    }  
});  
  
btnSave.setOnClickListener(new View.OnClickListener()  
{  
    @Override  
    public void onClick(View v) {  
  
        String data = display.getText().toString(); Intent intent = new Intent(ContactsContract.Intents.Insert.ACTION);  
  
        intent.setType(ContactsContract.RawContacts.CONTENT_TYPE);  
  
        intent.putExtra(ContactsContract.Intents.Insert.NAME, "Unknown");  
  
        intent.putExtra(ContactsContract.Intents.Insert.PHONE, data);  
  
        startActivity(intent);  
    }  
});
```

```
    }  
});  
  
btnRemove.setOnClickListener(new View.OnClickListener()  
{  
    @Override  
    public void onClick(View v) {  
  
        String data = display.getText().toString();  
  
        if(data.length()>0){  
            String val = data.substring(0,da-  
1);  
            data.length()-  
  
            display.setText(val);  
        }  
        else{  
            display.setText("");  
        }  
  
    }  
});  
}
```