

HKBK COLLEGE OF ENGINEERING
(Affiliated to VTU, Belgaum and Approved by AICTE)

DEPARTMENT OF ISE



LABORATORY MANUAL
MOBILE APPLICATION DEVELOPMENT LABORATORY

18CSMP68

[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2018)



HKBK COLLEGE OF ENGINEERING
(Affiliated to VTU, Belgaum and Approved by AICTE)
DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

Course outcomes: On the completion of this laboratory course,

The students will be able to:

- Create, test and debug Android application by setting up Android development environment.
- Implement adaptive, responsive user interfaces that work across a wide range of devices.
- Infer long running tasks and background work in Android applications.
- Demonstrate methods in storing, sharing and retrieving data in Android applications.
- Infer the role of permissions and security for Android applications

Hours/Week: 04

CIE Marks: 40

Semester: 6

Exam Hours: 03

Total Hours: 40

SEE Marks: 100

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.



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/textView"
        android:layout_width="149dp"
        android:layout_height="42dp"
        android:layout_marginStart="16dp"
        android:layout_marginTop="64dp"
        android:text="Infosys Tec"
        android:textSize="22sp"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="229dp"
        android:layout_height="51dp"
        android:layout_marginBottom="16dp"
        android:text="Software Developer"
        android:textSize="20sp"
        app:layout_constraintBottom_toTopOf="@+id/textView3"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent" />

    <TextView
        android:id="@+id/textView3"
        android:layout_width="234dp"
        android:layout_height="48dp"
        android:layout_marginBottom="24dp"
        android:text="879224867"
        android:textSize="20sp"
        app:layout_constraintBottom_toTopOf="@+id/textView4"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent" />
```

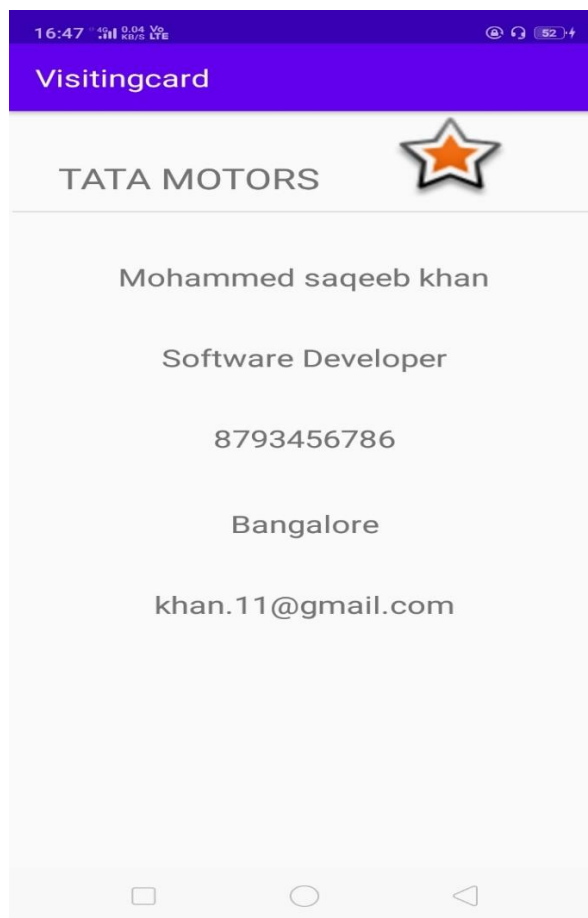
```
<TextView
    android:id="@+id/textView4"
    android:layout_width="232dp"
    android:layout_height="48dp"
    android:layout_marginBottom="32dp"
    android:text="Bangalore"
    android:textSize="20sp"
    app:layout_constraintBottom_toTopOf="@+id/textView6"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.501"
    app:layout_constraintStart_toStartOf="parent" />

<TextView
    android:id="@+id/textView5"
    android:layout_width="238dp"
    android:layout_height="50dp"
    android:layout_marginBottom="16dp"
    android:text="    sageeb"
    android:textSize="20sp"
    app:layout_constraintBottom_toTopOf="@+id/textView2"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintStart_toStartOf="parent" />

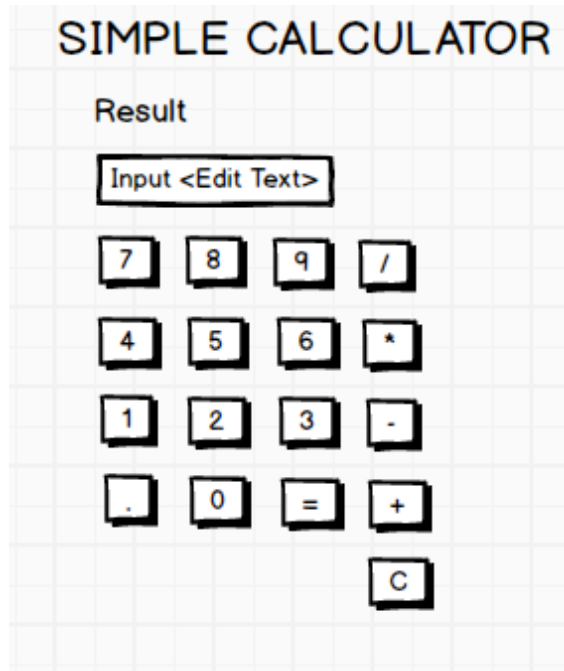
<TextView
    android:id="@+id/textView6"
    android:layout_width="228dp"
    android:layout_height="43dp"
    android:layout_marginBottom="204dp"
    android:text="khan.11@gmail.com"
    android:textSize="20sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.502"
    app:layout_constraintStart_toStartOf="parent" />

<View
    android:id="@+id/divider"
    android:layout_width="409dp"
    android:layout_height="1dp"
    android:layout_marginBottom="56dp"
    android:background="?android:attr/listDivider"
    app:layout_constraintBottom_toTopOf="@+id/textView5"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent" />

<ImageView
    android:id="@+id/imageView"
    android:layout_width="96dp"
    android:layout_height="64dp"
    android:layout_marginBottom="36dp"
    app:layout_constraintBottom_toTopOf="@+id/divider"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.627"
    app:layout_constraintStart_toEndOf="@+id/textView"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="1.0"
    app:srcCompat="@android:drawable/star_on" />
</androidx.constraintlayout.widget.ConstraintLayout>
```



- Develop an Android application using controls like Button, Text View, Edit Text for designing a calculator having basic functionality like Addition, Subtraction, Multiplication, and Division.



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="com.example.calculator.MainActivity">

    <RelativeLayout
        android:layout_width="368dp"
        android:layout_height="495dp"
        android:layout_marginTop="8dp"
        android:layout_marginEnd="20dp"
        android:layout_marginBottom="8dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toTopOf="parent">

        <Button
            android:id="@+id/btn_1"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_below="@+id/edText1"
            android:layout_alignParentStart="true"
            android:layout_alignParentLeft="true"
            android:layout_marginTop="60dp"
            android:text="1"
            android:textSize="18sp" />

        <Button
            android:id="@+id/btn_0"
            android:layout_width="wrap_content"
```

```
android:layout_height="wrap_content"
android:layout_below="@+id/btn_8"
android:layout_toEndOf="@+id/btn_7"
android:layout_toRightOf="@+id/btn_7"
android:text="0"
android:textSize="18sp" />
```

<Button

```
android:id="@+id/btn_9"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_below="@+id/btn_6"
android:layout_toEndOf="@+id/btn_5"
android:layout_toRightOf="@+id/btn_5"
android:text="9"
android:textSize="18sp" />
```

<Button

```
android:id="@+id/btn_8"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_below="@+id/btn_5"
android:layout_toEndOf="@+id/btn_7"
android:layout_toRightOf="@+id/btn_7"
android:text="8"
android:textSize="18sp" />
```

<Button

```
android:id="@+id/btn_7"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_below="@+id/btn_4"
android:layout_alignStart="@+id/btn_4"
android:layout_alignLeft="@+id/btn_4"
android:text="7"
android:textSize="18sp" />
```

<Button

```
android:id="@+id/btn_6"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignBaseline="@+id/btn_5"
android:layout_alignBottom="@+id/btn_5"
android:layout_toEndOf="@+id/btn_5"
android:layout_toRightOf="@+id/btn_5"
android:text="6"
android:textSize="18sp" />
```

<Button

```
android:id="@+id/btn_5"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_below="@+id/btn_2"
android:layout_toEndOf="@+id/btn_4"
android:layout_toRightOf="@+id/btn_4"
android:text="5"
android:textSize="18sp" />
```

<Button

```
android:id="@+id/btn_4"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_below="@+id/btn_1"
android:layout_alignStart="@+id/btn_1"
android:layout_alignLeft="@+id/btn_1"
android:text="4"
android:textSize="18sp" />
```

```
<Button
    android:id="@+id/btn_3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignBaseline="@+id/btn_2"
    android:layout_alignBottom="@+id/btn_2"
    android:layout_toEndOf="@+id/btn_2"
    android:layout_toRightOf="@+id/btn_2"
    android:text="3"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignBaseline="@+id/btn_1"
    android:layout_alignBottom="@+id/btn_1"
    android:layout_toEndOf="@+id/btn_1"
    android:layout_toRightOf="@+id/btn_1"
    android:text="2"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_Add"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_above="@+id/btn_6"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:backgroundTint="@android:color/darker_gray"
    android:text="+"
    android:textColor="@android:color/background_light"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_Sub"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/btn_Add"
    android:layout_alignStart="@+id/btn_Add"
    android:layout_alignLeft="@+id/btn_Add"
    android:backgroundTint="@android:color/darker_gray"
    android:text="-"
    android:textColor="@android:color/background_light"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_Mul"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/btn_6"
    android:layout_alignStart="@+id/btn_Sub"
    android:layout_alignLeft="@+id/btn_Sub"
    android:backgroundTint="@android:color/darker_gray"
    android:text="*"
    android:textColor="@android:color/background_light"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_Div"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/btn_9"
    android:layout_alignStart="@+id/btn_Mul"
    android:layout_alignLeft="@+id/btn_Mul"
    android:backgroundTint="@android:color/darker_gray"
```



```
        android:text="/"
        android:textColor="@android:color/background_light"
        android:textSize="18sp" />

    <EditText
        android:id="@+id/edText1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_alignParentLeft="true"
        android:layout_alignParentTop="true"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_marginTop="22dp"
        android:ems="10"
        android:inputType="textPersonName"
        android:textAlignment="textEnd"
        android:textSize="24sp" />

    <Button
        android:id="@+id/btn_calc"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/btn_0"
        android:layout_toEndOf="@+id/btn_0"
        android:layout_toRightOf="@+id/btn_0"
        android:backgroundTint="@android:color/holo_green_light"
        android:text=""
        android:textColor="@android:color/background_light"
        android:textSize="18sp" />

    <Button
        android:id="@+id/btn_dec"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/btn_7"
        android:layout_toStartOf="@+id/btn_8"
        android:layout_toLeftOf="@+id/btn_8"
        android:text="."
        android:textSize="18sp" />

    <Button
        android:id="@+id/btn_clear"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/btn_Div"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:backgroundTint="@android:color/holo_blue_dark"
        android:text="clear"
        android:textColor="@android:color/background_light"
        android:textSize="18sp" />
</RelativeLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

Main Activity.java

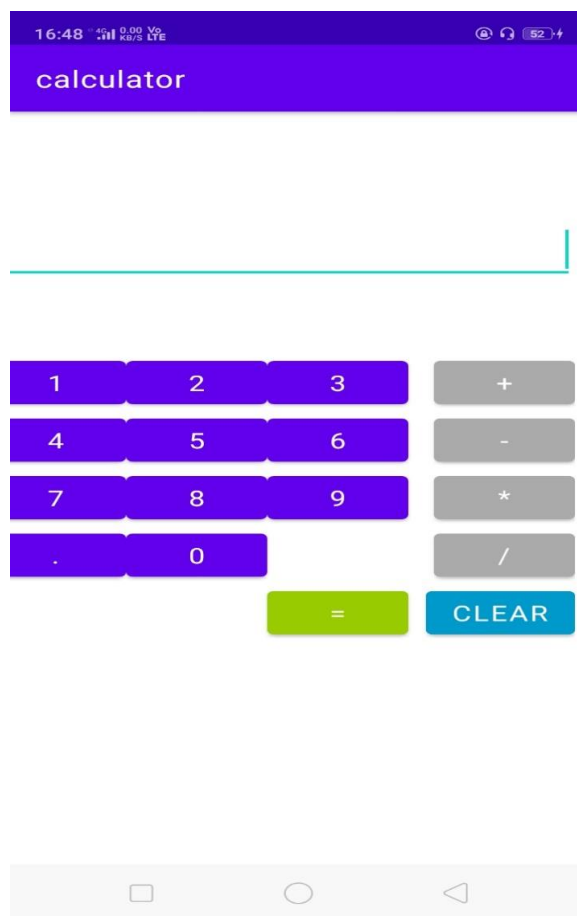
```
package com.example.calculator;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    Button
    btn_1,btn_2,btn_3,btn_4,btn_5,btn_6,btn_7,btn_8,btn_9,btn_0,btn_Add,btn_Sub,btn_Mul
    ,btn_Div,btn_calc,btn_dec,btn_clear;
    EditText ed1;
    float Value1, Value2;
    boolean mAddition, mSubtract, mMultiplication, mDivision ;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        btn_0 = (Button) findViewById(R.id.btn_0);
        btn_1 = (Button) findViewById(R.id.btn_1);
        btn_2 = (Button) findViewById(R.id.btn_2);
        btn_3 = (Button) findViewById(R.id.btn_3);
        btn_4 = (Button) findViewById(R.id.btn_4);
        btn_5 = (Button) findViewById(R.id.btn_5);
        btn_6 = (Button) findViewById(R.id.btn_6);
        btn_7 = (Button) findViewById(R.id.btn_7);
        btn_8 = (Button) findViewById(R.id.btn_8);
        btn_9 = (Button) findViewById(R.id.btn_9);
        btn_Add = (Button) findViewById(R.id.btn_Add);
        btn_Div = (Button) findViewById(R.id.btn_Div);
        btn_Sub = (Button) findViewById(R.id.btn_Sub);
        btn_Mul = (Button) findViewById(R.id.btn_Mul);
        btn_calc = (Button) findViewById(R.id.btn_calc);
        btn_dec = (Button) findViewById(R.id.btn_dec);
        btn_clear = (Button) findViewById(R.id.btn_clear);
        ed1 = (EditText) findViewById(R.id.edText1);
        btn_0.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                ed1.setText(ed1.getText()+"0");
            }
        });
        btn_1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                ed1.setText(ed1.getText()+"1");
            }
        });
        btn_2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                ed1.setText(ed1.getText()+"2");
            }
        });
        btn_3.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                ed1.setText(ed1.getText()+"3");
            }
        });
    }
}
```

```
});  
btn_4.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        ed1.setText(ed1.getText()+"4");  
    }  
});  
btn_5.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        ed1.setText(ed1.getText()+"5");  
    }  
});  
  
btn_6.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        ed1.setText(ed1.getText()+"6");  
    }  
});  
btn_7.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        ed1.setText(ed1.getText()+"7");  
    }  
});  
btn_8.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        ed1.setText(ed1.getText()+"8");  
    }  
});  
btn_9.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        ed1.setText(ed1.getText()+"9");  
    }  
});  
  
btn_dec.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        ed1.setText(ed1.getText()+".");  
    }  
});  
btn_Add.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        if (ed1 == null){  
            ed1.setText("");  
        }else {  
            Valuel = Float.parseFloat(ed1.getText() + "");  
            mAddition = true;  
            ed1.setText(null);  
        }  
    }  
});  
btn_Sub.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        Valuel = Float.parseFloat(ed1.getText() + "");  
        mSubtract = true ;  
        ed1.setText(null);  
    }  
});  
btn_Mul.setOnClickListener(new View.OnClickListener() {  
    @Override
```

```
        public void onClick(View v) {
            Value1 = Float.parseFloat(ed1.getText() + "");
            mMultiplication = true ;
            ed1.setText(null);
        }
    });
    btn_Div.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            Value1 = Float.parseFloat(ed1.getText()+"");
            mDivision = true ;
            ed1.setText(null);
        }
    });
    btn_calc.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            Value2 = Float.parseFloat(ed1.getText() + "");
            if (mAddition == true){
                ed1.setText(Value1 + Value2 + "");
                mAddition=false;
            }
            if (mSubtract == true){
                ed1.setText(Value1 - Value2 + "");
                mSubtract=false;
            }
            if (mMultiplication == true){
                ed1.setText(Value1 * Value2 + "");
                mMultiplication=false;
            }
            if (mDivision == true){
                ed1.setText(Value1 / Value2+"");
                mDivision=false;
            }
        }
    });
    btn_clear.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            ed1.setText("");
        }
    });
}
```



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.

The image shows the SIGNUP ACTIVITY UI. It has a title "SIGNUP ACTIVITY" at the top. Below the title, there are two input fields: "Username:" and "Password:". Below the "Password:" field, there is a button labeled "SIGN UP".

The image shows the LOGIN ACTIVITY UI. It has a title "LOGIN ACTIVITY" at the top. Below the title, there are two input fields: "Username:" and "Password:". Below the "Password:" field, there is a button labeled "SIGN IN".

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="com.example.loginandsign_up.MainActivity">

    <RelativeLayout
        android:layout_width="410dp"
        android:layout_height="387dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="1.0"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent">

        <TextView
            android:id="@+id/textView2"
            android:layout_width="120dp"
            android:layout_height="39dp"
            android:layout_alignParentStart="true"
            android:layout_alignParentBottom="true"
            android:layout_marginStart="20dp"
            android:layout_marginEnd="28dp"
            android:layout_marginBottom="175dp"
            android:layout_toStartOf="@+id/editText2"
            android:text=" password"
            android:textSize="25sp" />
```

```
<EditText
    android:id="@+id/editText"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_above="@+id/editText2"
    android:layout_alignParentTop="true"
    android:layout_alignParentEnd="true"
    android:layout_marginTop="72dp"
    android:layout_marginEnd="35dp"
    android:layout_marginBottom="51dp"
    android:ems="10"
    android:inputType="textPersonName" />

<EditText
    android:id="@+id/editText2"
    android:layout_width="wrap_content"
    android:layout_height="50dp"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="32dp"
    android:layout_marginBottom="170dp"
    android:ems="10"
    android:inputType="textPassword" />

<Button
    android:id="@+id/button"
    android:layout_width="114dp"
    android:layout_height="58dp"
    android:layout_alignParentStart="true"
    android:layout_alignParentTop="true"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginStart="149dp"
    android:layout_marginTop="264dp"
    android:layout_marginEnd="147dp"
    android:layout_marginBottom="65dp"
    android:text="Sign in" />

<TextView
    android:id="@+id/textView3"
    android:layout_width="136dp"
    android:layout_height="39dp"
    android:layout_alignParentStart="true"
    android:layout_alignParentTop="true"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginStart="150dp"
    android:layout_marginTop="13dp"
    android:layout_marginEnd="124dp"
    android:layout_marginBottom="335dp"
    android:text="Sign up"
    android:textSize="25sp" />

<TextView
    android:id="@+id/textView"
    android:layout_width="119dp"
    android:layout_height="37dp"
    android:layout_above="@+id/textView2"
    android:layout_alignParentStart="true"
    android:layout_marginStart="26dp"
    android:layout_marginEnd="21dp"
    android:layout_marginBottom="63dp"
    android:layout_toStartOf="@+id/editText"
    android:text="User name"
    android:textSize="20sp" />

</RelativeLayout>
```

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

SecondActivity.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"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    xmlns:tools="http://schemas.android.com/tools"
    tools:context="com.example.loginandsign_up.SecondActivity">

    <RelativeLayout
        android:layout_width="406dp"
        android:layout_height="419dp"
        app:layout_constraintBottom_toBottomOf="parent"
        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_alignParentStart="true"
            android:layout_alignParentBottom="true"
            android:layout_marginStart="24dp"
            android:layout_marginEnd="8dp"
            android:layout_marginBottom="199dp"
            android:layout_toStartOf="@+id/editText2"
            android:text="Password"
            android:textSize="25sp" />

        <EditText
            android:id="@+id/editText"
            android:layout_width="222dp"
            android:layout_height="49dp"
            android:layout_above="@+id/editText2"
            android:layout_alignParentTop="true"
            android:layout_alignParentEnd="true"
            android:layout_marginTop="84dp"
            android:layout_marginEnd="30dp"
            android:layout_marginBottom="46dp"
            android:ems="10"
            android:inputType="textPersonName" />

        <EditText
            android:id="@+id/editText2"
            android:layout_width="224dp"
            android:layout_height="wrap_content"
            android:layout_alignParentEnd="true"
            android:layout_alignParentBottom="true"
            android:layout_marginEnd="30dp"
            android:layout_marginBottom="195dp"
            android:ems="10"
            android:inputType="textPassword" />

        <Button
            android:id="@+id/button"
            android:layout_width="122dp"
            android:layout_height="52dp"
            android:layout_alignParentStart="true"
            android:layout_alignParentTop="true"
```



```

        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginStart="149dp"
        android:layout_marginTop="266dp"
        android:layout_marginEnd="135dp"
        android:layout_marginBottom="101dp"
        android:text="Log in"
        android:textSize="20sp" />

<TextView
    android:id="@+id/textView3"
    android:layout_width="94dp"
    android:layout_height="45dp"
    android:layout_alignParentStart="true"
    android:layout_alignParentTop="true"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginStart="158dp"
    android:layout_marginTop="18dp"
    android:layout_marginEnd="154dp"
    android:layout_marginBottom="356dp"
    android:text="Log in"
    android:textSize="25sp" />

<TextView
    android:id="@+id/textView5"
    android:layout_width="wrap_content"
    android:layout_height="44dp"
    android:layout_above="@+id/textView2"
    android:layout_alignParentStart="true"
    android:layout_marginStart="23dp"
    android:layout_marginEnd="15dp"
    android:layout_marginBottom="61dp"
    android:layout_toStartOf="@+id/editText"
    android:text="User name"
    android:textSize="20sp" />
</RelativeLayout>
</androidx.constraintlayout.widget.ConstraintLayout>

```

Third 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="com.example.loginandsign_up.ThirdActivity">

    <TextView
        android:id="@+id/textView4"
        android:layout_width="302dp"
        android:layout_height="48dp"
        android:text="TextView"
        android:textSize="30sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>

```

Main Activity.java

```
package com.example.loginandsign_up;

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

import androidx.appcompat.app.AppCompatActivity;

import com.example.loginandsign_up.SecondActivity;

import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity {

    EditText e1,e2;
    Button bt;
    String name1, name2;
    private static final Pattern PASSWORD_PATTERN =
        Pattern.compile("^" + "(?=[@#$%^&+=])" + "(?=[\\S+$)" + "(?=[A-Z])" + "(?=[a-z])." + ".{8,}" + "$");
    private boolean validatePassword() {
        String passwordInput = name2.trim();
        // if password field is empty
        // it will display error message "Field can not be empty"

        Toast.makeText(getApplicationContext(), passwordInput,
Toast.LENGTH_SHORT).show();
        if (passwordInput.isEmpty()) {
            e2.setError("Field can not be empty");
            return false;
        }
        // if password does not matches to the pattern
        // it will display an error message "Password is too weak"
        else if (!PASSWORD_PATTERN.matcher(passwordInput).matches()) {
            e2.setError("Password is too weak");
            return false;
        } else {
            e2.setError(null);
            return true;
        }
    }
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        e1 = (EditText) findViewById(R.id.editText);
        e2 = (EditText) findViewById(R.id.editText2);
        bt = (Button) findViewById(R.id.button);
        bt.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                name1 = e1.getText().toString();
                name2 = e2.getText().toString();
                if (validatePassword()) {
                    //Intent For Navigating to Second Activity
                    Intent i = new Intent(MainActivity.this,
SecondActivity.class);
                    //For Passing the Values to Second Activity
                    i.putExtra("name_key", name1);
                    i.putExtra("reg_key", name2);
                }
            }
        });
    }
}
```

```

        startActivity(i);
    }
}
});
}
}

```

Second Activity.java

```

package com.example.loginandsign_up;

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

import androidx.appcompat.app.AppCompatActivity;

public class SecondActivity extends AppCompatActivity{
    EditText e1,e2;
    Button b;
    String name1,name2;
    int c=0;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.secondactivity_main);
        e1 = (EditText) findViewById(R.id.editText);
        e2 = (EditText) findViewById(R.id.editText2);
        b = (Button) findViewById(R.id.button);
        b.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                name1 = e1.getText().toString();
                name2 = e2.getText().toString();
                String n1=getIntent().getStringExtra("name_key");
                String n2=getIntent().getStringExtra("reg_key");
                if(name1.equals(n1)&&name2.equals(n2)){
                    String flag="1";
                    Intent i = new Intent(SecondActivity.this,
ThirdActivity.class);
                    i.putExtra("flag", flag);
                    startActivity(i);
                }else if(c==2){
                    Toast.makeText(getApplicationContext(),"Failed Login
Attempts",Toast.LENGTH_SHORT).show();
                }else{
                    c+=1;
                    String flag="2";
                    Intent i = new Intent(SecondActivity.this,
ThirdActivity.class);
                    i.putExtra("flag", flag);
                    startActivity(i);
                }
            }
        });
    }
}

```

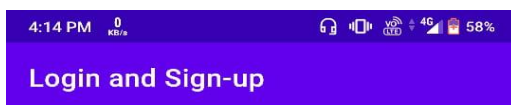
Third Activity.java

```
package com.example.loginandsign_up;

import android.annotation.SuppressLint;
import android.os.Bundle;
import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class ThirdActivity extends AppCompatActivity {
    TextView t;
    @SuppressLint("SetTextI18n")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.thirdactivity_main);
        t = (TextView) findViewById(R.id.textView4);
        String f = getIntent().getStringExtra("flag");
        if (f.equals("1")) {
            t.setText("Login Successfull");
        } else if (f.equals("2")) {
            t.setText("Login Failed");
        }
    }
}
```

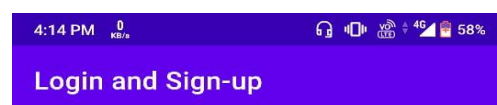


Sign-up Activity

Username _____

Password _____

SIGN-UP



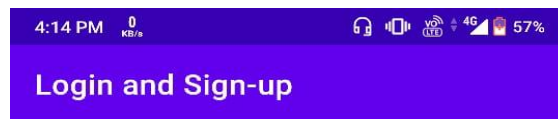
Login Activity

Username _____

Password _____

LOGIN

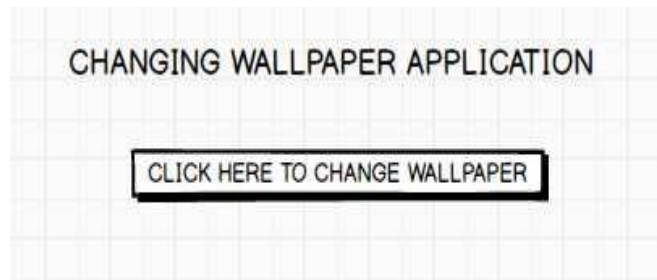




Login Successfull



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 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/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Wall Paper Changer"
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.208" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="change wallpaper"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView" />

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

```
package com.example.wallpaper;

import androidx.appcompat.app.AppCompatActivity;

import android.app.WallpaperManager;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.Toast;

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

public class MainActivity extends AppCompatActivity {
    int[] images;
    Handler handler;
    Runnable runnable;
    int delay = 30000;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main); handler = new Handler();
    }
    @Override
    protected void onResume() {
        handler.postDelayed(runnable = new Runnable() {
            public void run() { handler.postDelayed(runnable, delay);
                SetWallPaper();
                //Toast.makeText(MainActivity.this,
                // "This method is run every 30
                Object seconds;
                seconds;

            }

        },
            delay); super.onResume();
    }
    @Override
    protected void onPause() {
        super.onPause();
        handler.removeCallbacks(runnable); //stop handler when activity not
        visible super.onPause();
    }

    public void ChangeImage(View view) {
        SetWallPaper();
    }
    private void SetWallPaper()
    {
        images = new int[]
{R.drawable.a,R.drawable.b,R.drawable.c,R.drawable.d};
        int arylength = images.length; Random random = new Random();
        int rnum = random.nextInt(arylenght);
        Bitmap bitmap =
        BitmapFactory.decodeResource(getResources(), images[rnum]);
```

```
WallpaperManager manager =  
    WallpaperManager.getInstance(getApplicationContext());  
try {  
    manager.setBitmap(bitmap);  
    Toast.makeText(this, "Wall Paper  
changed", Toast.LENGTH_SHORT).show();  
}  
catch (IOException e)  
{  
    Toast.makeText(this, "Error", Toast.LENGTH_SHORT).show();  
}  
}
```



Wall Paper Changer

CHANGE WALLPAPER



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 Text View control



Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="fill_parent"
    ><TextView
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:text="hello"
    />
    <Chronometer
        android:id="@+id/chronometer"
        android:layout_gravity="center_horizontal"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        />
    <Button
        android:id="@+id/buttonstart"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="start"
        />
    <Button
        android:id="@+id/buttonstop"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="stop"
        />
    <Button android:id="@+id/buttonreset"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="reset"
        />
</LinearLayout>
```

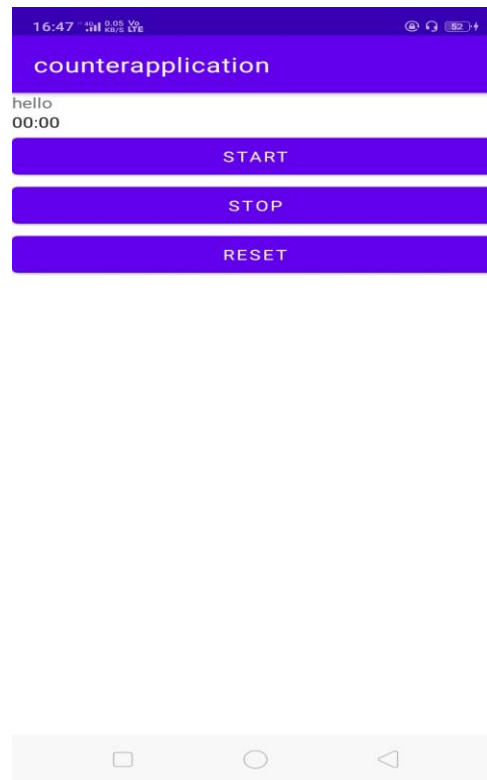
Main Activity.java

```
package com.example.counterapplication;
import androidx.appcompat.app.AppCompatActivity;

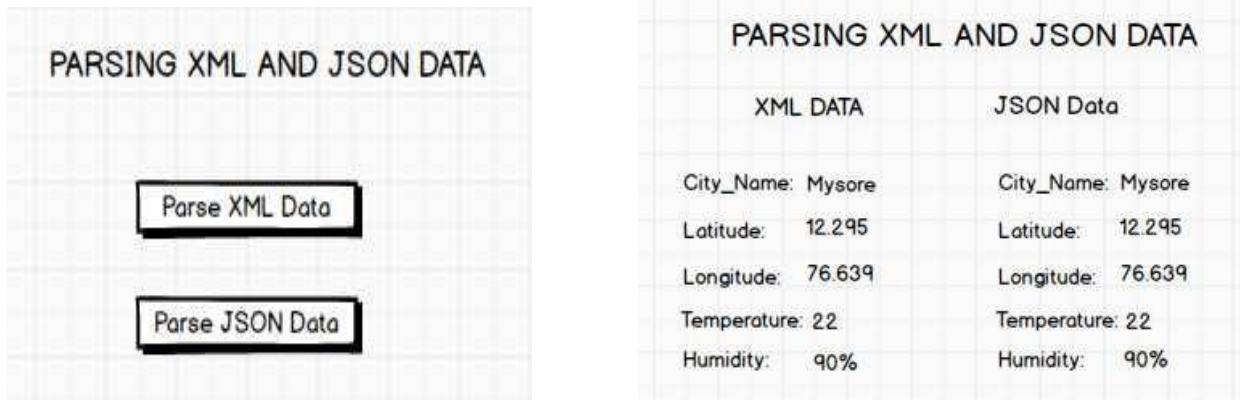
import android.os.Bundle;
import android.os.SystemClock;
import android.view.View;
import android.widget.Button;
import android.widget.Chronometer;

public class MainActivity extends AppCompatActivity {

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        final Chronometer myChronometer =
            (Chronometer) findViewById(R.id.chronometer);
        Button buttonStart = (Button) findViewById(R.id.buttonstart);
        Button buttonStop = (Button) findViewById(R.id.buttonstop);
        Button buttonReset = (Button) findViewById(R.id.buttonreset);
        buttonStart.setOnClickListener(new Button.OnClickListener() {
            @Override
            public void onClick(View v) {
                // TODO Auto-generated method stub
                myChronometer.start();
            }
        });
        buttonStop.setOnClickListener(new Button.OnClickListener() {
            @Override
            public void onClick(View v) {
                // TODO Auto-generated method stub
                myChronometer.stop();
            }
        });
        buttonReset.setOnClickListener(new Button.OnClickListener() {
            @Override
            public void onClick(View v) {
                // TODO Auto-generated method stub
                myChronometer.setBase(SystemClock.elapsedRealtime());
            }
        });
    }
}
```



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.



Activity_main.xml

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

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="XML"
        android:textSize="16sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.241"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.342" />

    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="JSON"
        android:textSize="16sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.547"
        app:layout_constraintStart_toEndOf="@+id/button"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.342" />

    <TextView
        android:id="@+id/tv1"
        android:layout_width="118dp"
        android:layout_height="96dp"
        android:text="TextView"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.266"
        app:layout_constraintStart_toStartOf="parent"
```

```

        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.494" />

<TextView
    android:id="@+id/tv2"
    android:layout_width="123dp"
    android:layout_height="89dp"
    android:text="TextView"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.513"
    app:layout_constraintStart_toEndOf="@+id/tv1"
    app:layout_constraintTop_toTopOf="parent" />

<TextView
    android:id="@+id/textView"
    android:layout_width="155dp"
    android:layout_height="25dp"
    android:layout_marginTop="108dp"
    android:text=" Xml and Json Files"
    android:textSize="20sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>

```

Main Activity.java

```

package com.example.xmljson;

import androidx.appcompat.app.AppCompatActivity;

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

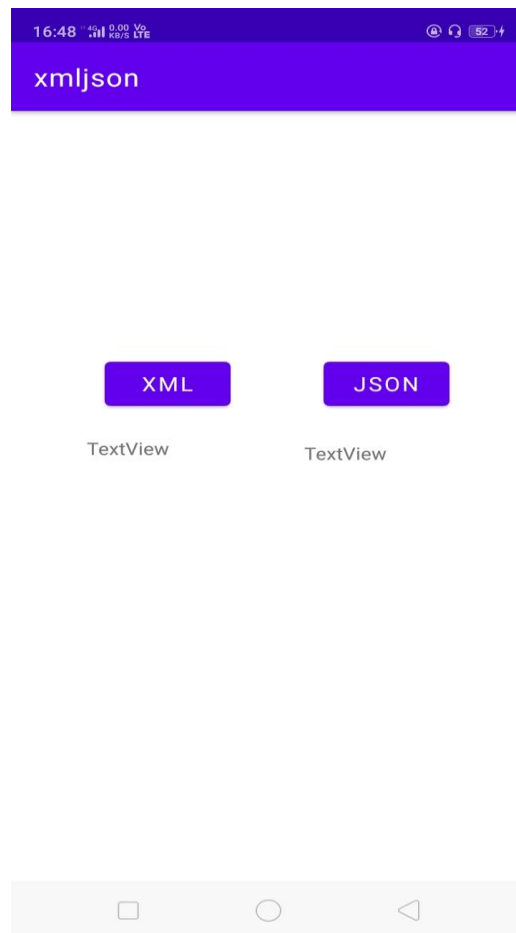
import org.json.JSONObject;
import org.w3c.dom.Document;
import org.w3c.dom.Element;
import org.w3c.dom.Node;
import org.w3c.dom.NodeList;
import java.io.InputStream;
import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;

public class MainActivity extends AppCompatActivity {

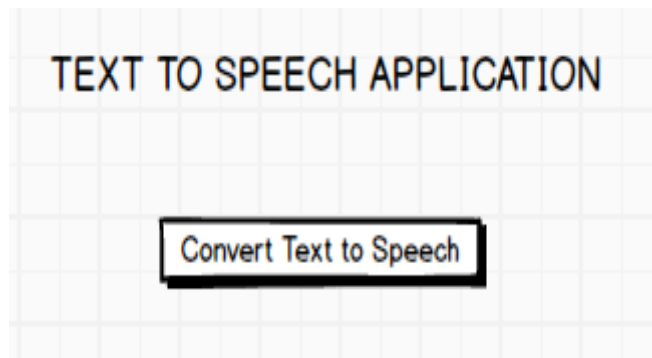
    public static final String
    JSON_STRING="{\"student\":{\"name\":\"Sachin\",\"city\":\"Bengaluru\"}}";
    TextView tv1,tv2;
    Button b1,b2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        tv1=(TextView) findViewById(R.id.tv1);
        tv2=(TextView) findViewById(R.id.tv2);
        b1=(Button) findViewById(R.id.button);
        b2=(Button) findViewById(R.id.button2);
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                xmlread(view);
            }
        }
    }

```

```
});
b2.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        readJson(view);
    }
});
}
public void xmlread(View view) {
    try {
        InputStream is = getAssets().open("stu.xml");
        DocumentBuilderFactory dbFactory =
DocumentBuilderFactory.newInstance();
        DocumentBuilder dBuilder = dbFactory.newDocumentBuilder();
        Document doc = dBuilder.parse(is);
        Element element=doc.getDocumentElement();
        element.normalize();
        NodeList nList = doc.getElementsByTagName("student");
        for (int i=0; i<nList.getLength(); i++) {
            Node node = nList.item(i);
            if (node.getNodeType() == Node.ELEMENT_NODE) {
                Element element2 = (Element) node;
                String s="\nName : " + getValue("name", element2)+"\n";
                tv1.setText(s);
                s=tv1.getText()+"city : " + getValue("city",
element2)+"\n";
                tv1.setText(s);
            }
        }
    } catch (Exception e) {e.printStackTrace();}
}
private static String getValue(String tag, Element element) {
    NodeList nodeList =
        element.getElementsByTagName(tag).item(0).getChildNodes();
    Node node = nodeList.item(0);
    return node.getNodeValue();
}
public void readJson(View view) {
    try{
        JSONObject emp=(new
JSONObject(JSON_STRING)).getJSONObject("student");
        String empname=emp.getString("name");
        String city=emp.getString("city");
        String str="Name:"+empname+"\n"+"City:"+city;
        tv2.setText(str);
    }catch (Exception e) {e.printStackTrace();}
}
}
```



7. Develop a simple application with one Edit Text 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.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView"
        android:layout_width="221dp"
        android:layout_height="43dp"
        android:layout_marginTop="112dp"
        android:text="Text To Speech"
        android:textSize="24sp"
        app:layout_constraintBottom_toTopOf="@+id/editTextTextPersonName2"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.473"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.127" />

    <EditText
        android:id="@+id/editTextTextPersonName2"
        android:layout_width="275dp"
        android:layout_height="53dp"
        android:layout_marginBottom="120dp"
        android:ems="10"
        android:inputType="textPersonName"
        android:text="Enter the Text"
        android:textSize="20sp"
        app:layout_constraintBottom_toTopOf="@+id/button2"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent" />
```



```

<Button
    android:id="@+id/button2"
    android:layout_width="211dp"
    android:layout_height="57dp"
    android:layout_marginBottom="236dp"
    android:text=" Click To Convert"
    android:textSize="16sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintStart_toStartOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>

```

Main Activity.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;

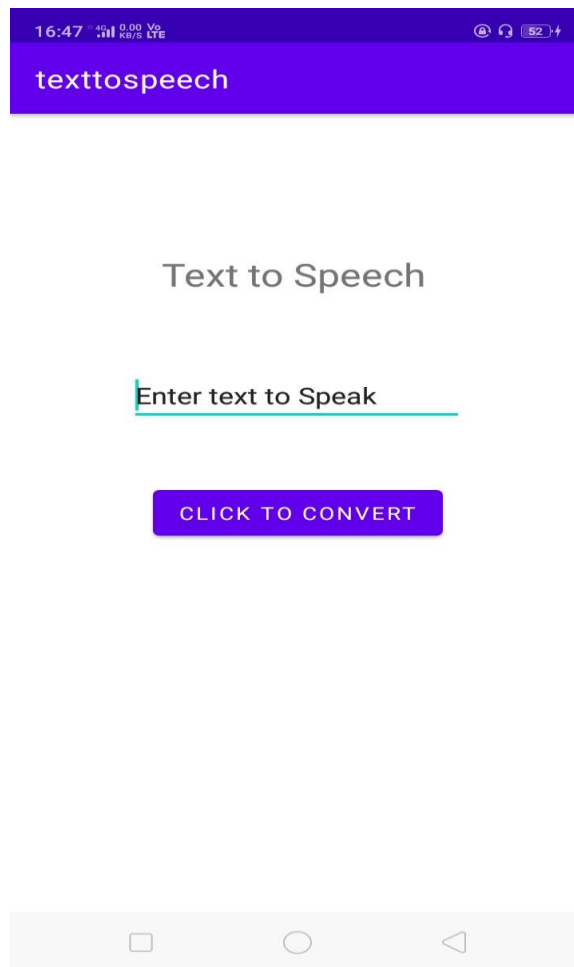
public class MainActivity extends AppCompatActivity {
    TextToSpeech t1;
    EditText ed1;
    Button b1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ed1=(EditText) findViewById(R.id.editTextTextPersonName);
        b1=(Button) findViewById(R.id.button);

        t1=new TextToSpeech(getApplicationContext(), new
            TextToSpeech.OnInitListener() {
                @Override
                public void onInit(int status) {
                    if(status != TextToSpeech.ERROR) {
                        t1.setLanguage(Locale.UK);
                    }
                }
            });

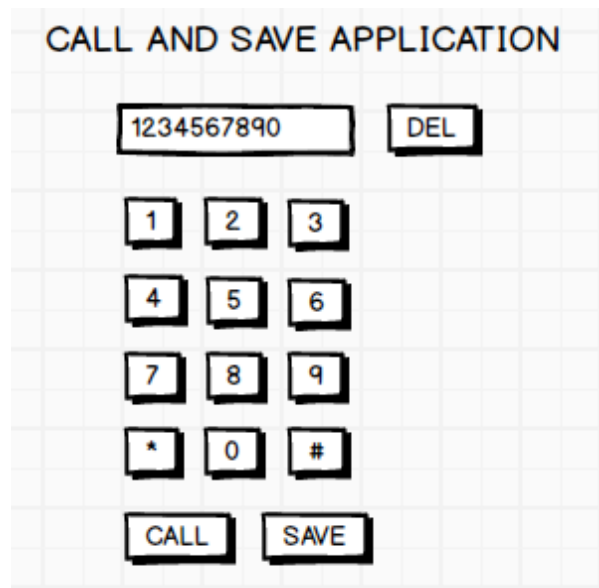
    }

    public void Text2Speech(View view) {
        String toSpeak = ed1.getText().toString();
        Toast.makeText(getApplicationContext(),
            toSpeak,Toast.LENGTH_SHORT).show();
        t1.speak(toSpeak, 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.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="com.example.phonedail.MainActivity">

    <LinearLayout
        android:layout_width="358dp"
        android:layout_height="517dp"
        android:orientation="vertical"
        android:weightSum="6"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.498">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:orientation="horizontal"
            android:weightSum="1">

            <EditText
                android:id="@+id/display"
                android:layout_width="match_parent"
                android:layout_height="100dp"
                android:layout_weight="1"
                android:textSize="60dp"/>

        </LinearLayout>

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:orientation="horizontal">
```

```
        android:weightSum="2">

        <Button
            android:id="@+id/buttonDel"
            android:layout_width="match_parent"
            android:layout_height="100dp"
            android:layout_weight="1"
            android:text="CALL" />

        <Button
            android:id="@+id/buttoneql"
            android:layout_width="match_parent"
            android:layout_height="100dp"
            android:layout_weight="1"
            android:text="SAVE" />
    </LinearLayout>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:orientation="horizontal"
        android:weightSum="3">

        <Button
            android:id="@+id/b1"
            android:layout_width="match_parent"
            android:layout_height="100dp"
            android:layout_weight="1"
            android:text="1" />

        <Button
            android:id="@+id/b2"
            android:layout_width="match_parent"
            android:layout_height="100dp"
            android:layout_weight="1"
            android:text="2" />

        <Button
            android:id="@+id/b3"
            android:layout_width="match_parent"
            android:layout_height="100dp"
            android:layout_weight="1"
            android:text="3" />
    </LinearLayout>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:orientation="horizontal"
        android:weightSum="3">

        <Button
            android:id="@+id/b4"
            android:layout_width="match_parent"
            android:layout_height="100dp"
            android:layout_weight="1"
            android:text="4" />

        <Button
            android:id="@+id/b5"
            android:layout_width="match_parent"
            android:layout_height="100dp"
            android:layout_weight="1"
            android:text="5" />
```

```
<Button
    android:id="@+id/b6"
    android:layout_width="match_parent"
    android:layout_height="100dp"
    android:layout_weight="1"
    android:text="6" />
</LinearLayout>

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:orientation="horizontal"
    android:weightSum="3">

    <Button
        android:id="@+id/b7"
        android:layout_width="match_parent"
        android:layout_height="100dp"
        android:layout_weight="1"
        android:text="7" />

    <Button
        android:id="@+id/b8"
        android:layout_width="match_parent"
        android:layout_height="100dp"
        android:layout_weight="1"
        android:text="8" />

    <Button
        android:id="@+id/b9"
        android:layout_width="match_parent"
        android:layout_height="100dp"
        android:layout_weight="1"
        android:text="9" />
</LinearLayout>

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:orientation="horizontal"
    android:weightSum="2">

    <Button
        android:id="@+id/b0"
        android:layout_width="match_parent"
        android:layout_height="100dp"
        android:layout_weight="1"
        android:text="0" />

    <Button
        android:id="@+id/BRemain"
        android:layout_width="match_parent"
        android:layout_height="100dp"
        android:layout_weight="1"
        android:text="DEL" />
</LinearLayout>
</LinearLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

Main Activity.java

```
package com.example.phonedail;

import androidx.appcompat.app.AppCompatActivity;

import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;
import android.Manifest;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.net.Uri;
import android.os.Build;
import android.os.Bundle;
import android.provider.ContactsContract;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

import com.example.phonedail.R;

public class MainActivity extends AppCompatActivity {
    double in1 = 0, i2 = 0;
    TextView edittext1;
    boolean Add, Sub, Multiply, Divide, Remainder, deci;
    Button button_0, button_1, button_2, button_3, button_4, button_5, button_6,
        button_7, button_8, button_9, button_Add, button_Sub,
        button_Mul, button_Div, button_Equ, button_del, button_call,
button_save;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        button_0 = (Button) findViewById(R.id.b0);
        button_1 = (Button) findViewById(R.id.b1);
        button_2 = (Button) findViewById(R.id.b2);
        button_3 = (Button) findViewById(R.id.b3);
        button_4 = (Button) findViewById(R.id.b4);
        button_5 = (Button) findViewById(R.id.b5);
        button_6 = (Button) findViewById(R.id.b6);
        button_7 = (Button) findViewById(R.id.b7);
        button_8 = (Button) findViewById(R.id.b8);
        button_9 = (Button) findViewById(R.id.b9);
        button_del = (Button) findViewById(R.id.BRemain);
        button_call = (Button) findViewById(R.id.buttonDel);
        button_save = (Button) findViewById(R.id.buttoneq1);
        edittext1 = (TextView) findViewById(R.id.display);
        button_1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                edittext1.setText(edittext1.getText() + "1");
            }
        });
        button_2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                edittext1.setText(edittext1.getText() + "2");
            }
        });
        button_3.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                edittext1.setText(edittext1.getText() + "3");
            }
        });
        button_4.setOnClickListener(new View.OnClickListener() {
```

```

        @Override
        public void onClick(View v) {
            editText1.setText(editText1.getText() + "4");
        }
    });
    button_5.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            editText1.setText(editText1.getText() + "5");
        }
    });
    button_6.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            editText1.setText(editText1.getText() + "6");
        }
    });
    button_7.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            editText1.setText(editText1.getText() + "7");
        }
    });
    button_8.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            editText1.setText(editText1.getText() + "8");
        }
    });
    button_9.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            editText1.setText(editText1.getText() + "9");
        }
    });
    button_0.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            editText1.setText(editText1.getText() + "0");
        }
    });
    button_del.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            if (editText1.getText().length() != 0) {
                editText1.setText("");
                in1 = 0.0;
                i2 = 0.0;
            }
        }
    });
    button_save.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            Intent intent = new
Intent (ContactsContract.Intents.Insert.ACTION);
            intent.setType(ContactsContract.RawContacts.CONTENT_TYPE);
            intent.putExtra(ContactsContract.Intents.Insert.PHONE,
                editText1.getText());
            startActivity(intent);
        }
    });
    button_call.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            final int REQUEST_PHONE_CALL = 1;
            if (android.os.Build.VERSION.SDK_INT >= Build.VERSION_CODES.M) {

```

```
        if (ContextCompat.checkSelfPermission(MainActivity.this,
            Manifest.permission.CALL_PHONE) !=
PackageManager.PERMISSION_GRANTED) {
            ActivityCompat.requestPermissions(MainActivity.this, new
                String[]{Manifest.permission.CALL_PHONE},
REQUEST_PHONE_CALL);
        } else {
            String number = editText1.getText().toString();
            Intent callIntent = new Intent(Intent.ACTION_CALL);
            callIntent.setData(Uri.parse("tel:" + number));
            startActivity(callIntent);
        }
    }
}
});
}
```

