

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

### XMLCODE

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

```
<Button
    android:id="@+id/bclear"
    android:layout_width="68dp"
    android:layout_height="56dp"
    android:text="@string/c"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.801"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.792" />
```

```
<Button
    android:id="@+id/bdot"
    android:layout_width="68dp"
    android:layout_height="56dp"
    android:text="@string/dot"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.046"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.671" />
```

```
<Button
```

```
android:id="@+id/bdiv"
android:layout_width="68dp"
android:layout_height="56dp"
android:text="@string/div"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.801"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.671" />
```

<Button

```
android:id="@+id/b0"
android:layout_width="68dp"
android:layout_height="56dp"
android:text="@string/_0"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.297"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.671" />
```

<Button

```
android:id="@+id/bequal"
android:layout_width="68dp"
android:layout_height="56dp"
android:text="@string/equal"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.548"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.671"
tools:ignore="DuplicateSpeakableTextCheck" />
```

<Button

```
android:id="@+id/b1"
android:layout_width="68dp"
android:layout_height="56dp"
android:text="@string/_1"
android:textSize="24sp"
```

```
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.061"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.552" />
```

<Button

```
android:id="@+id/b2"
android:layout_width="68dp"
android:layout_height="56dp"
android:text="@string/_2"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.311"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.552" />
```

<Button

```
android:id="@+id/bmul"
android:layout_width="68dp"
android:layout_height="56dp"
android:text="@string/mul"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.816"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.552" />
```

<Button

```
android:id="@+id/b3"
android:layout_width="68dp"
android:layout_height="56dp"
android:text="@string/_3"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.562"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.552" />
```

```
<Button
    android:id="@+id/b4"
    android:layout_width="68dp"
    android:layout_height="56dp"
    android:text="@string/_4"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.061"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.451" />
```

```
<Button
    android:id="@+id/b6"
    android:layout_width="68dp"
    android:layout_height="56dp"
    android:text="@string/_6"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.562"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.451" />
```

```
<Button
    android:id="@+id/b5"
    android:layout_width="68dp"
    android:layout_height="56dp"
    android:text="@string/_5"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.311"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.451" />
```

```
<Button
    android:id="@+id/bsub"
    android:layout_width="68dp"
    android:layout_height="56dp"
    android:text="@string/sub"
```

```
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.816"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.451" />
```

<Button

```
android:id="@+id/badd"
android:layout_width="68dp"
android:layout_height="56dp"
android:text="@string/add1"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.816"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.354" />
```

<Button

```
android:id="@+id/b9"
android:layout_width="68dp"
android:layout_height="56dp"
android:text="@string/_9"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.562"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.354" />
```

<Button

```
android:id="@+id/b8"
android:layout_width="68dp"
android:layout_height="56dp"
android:text="@string/_8"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.311"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
```

```
app:layout_constraintVertical_bias="0.354" />
```

```
<TextView
    android:id="@+id/textView2"
    android:layout_width="341dp"
    android:layout_height="42dp"
    android:text="@string/simple_calculator"
    android:textAlignment="center"
    android:textColor="#9C27B0"
    android:textSize="34sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.316"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.043"
    tools:ignore="TextSizeCheck" />
```

```
<TextView
    android:id="@+id/textView"
    android:layout_width="146dp"
    android:layout_height="32dp"
    android:text="@string/result"
    android:textAlignment="center"
    android:textColor="#F44336"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.109"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.14"
    tools:ignore="TextSizeCheck" />
```

```
<EditText
    android:id="@+id/result"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:hint="@string/expression"
    android:inputType="textPersonName"
    android:textColor="#4CAF50"
    android:textSize="34sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
```

```

        app:layout_constraintHorizontal_bias="0.577"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.233"
        android:importantForAutofill="no" />

<Button
    android:id="@+id/b7"
    android:layout_width="68dp"
    android:layout_height="56dp"
    android:text="@string/_7"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.061"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.354" />

</androidx.constraintlayout.widget.ConstraintLayout>

```

## JAVA CODE

```

package com.example.calculator;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {
    Button zero, one, two, three, four, five, six,
    seven, eight, nine, add, sub, mul, div, del, clear,
    equal;
    TextView expr;
    String opr1="", opr2="", operator="";

    @Override
    protected void onCreate(Bundle
savedInstanceState) {

```

```

super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
zero = (Button)findViewById(R.id.btn0);
one = (Button)findViewById(R.id.btn1);
two = (Button)findViewById(R.id.btn2);
three = (Button)findViewById(R.id.btn3);
four = (Button)findViewById(R.id.btn4);
five = (Button)findViewById(R.id.btn5);
six = (Button)findViewById(R.id.btn6);
seven = (Button)findViewById(R.id.btn7);
eight = (Button)findViewById(R.id.btn8);
nine = (Button)findViewById(R.id.btn9);
add = (Button)findViewById(R.id.btnadd);
sub = (Button)findViewById(R.id.btnsign);
equal = (Button)findViewById(R.id.btnequal);
mul = (Button)findViewById(R.id.btnmul);
div = (Button)findViewById(R.id.btndiv);
del = (Button)findViewById(R.id.btndel);
clear=(Button)findViewById(R.id.btnclear);
expr = (TextView)
findViewById(R.id.textView3);

```

```

one.setOnClickListener(this::setValue);
zero.setOnClickListener(this::setValue);
two.setOnClickListener(this::setValue);
three.setOnClickListener(this::setValue);
four.setOnClickListener(this::setValue);
five.setOnClickListener(this::setValue);
six.setOnClickListener(this::setValue);
seven.setOnClickListener(this::setValue);
eight.setOnClickListener(this::setValue);
nine.setOnClickListener(this::setValue);
add.setOnClickListener(this::setOpr);
sub.setOnClickListener(this::setOpr);
equal.setOnClickListener(this::getResult);
mul.setOnClickListener(this::setOpr);
div.setOnClickListener(this::setOpr);
del.setOnClickListener(this::delChar);
clear.setOnClickListener(this::ClearValue);

```

```

}

```

```

private void ClearValue(View view) {
    operator = "";
}

```



```

        opr1 = "";
        opr2 = "";
        expr.setText("");
    }

    private void getResult(View v) {
        double result = 0;
        boolean flag = true;
        if(!opr1.equals("") || !opr2.equals("")){
            switch(operator){
                case "+":
                    result = Double.parseDouble(opr1)
+ Double.parseDouble(opr2);
                    break;
                case "-":
                    result = Double.parseDouble(opr1)
- Double.parseDouble(opr2);
                    break;
                case "*":
                    result = Double.parseDouble(opr1)
* Double.parseDouble(opr2);
                    break;
                case "/":
                    if(Double.parseDouble(opr2)==0.0)
                        flag=false;
                    else
                        result =
Double.parseDouble(opr1) / Double.parseDouble(opr2);
                    break;
            }
            opr1 = ((result %1 !=0)) ?
String.valueOf(result) :
String.valueOf(((int)result));
            expr.setText(opr1);
            operator = "";
            opr2="";
        }
    }

    private void setOpr(View v) {
        CharSequence text = ((Button) v).getText();
        opr1 = expr.getText().toString();
        operator = text.toString();
        CharSequence t = ((Button) v).getText();

```

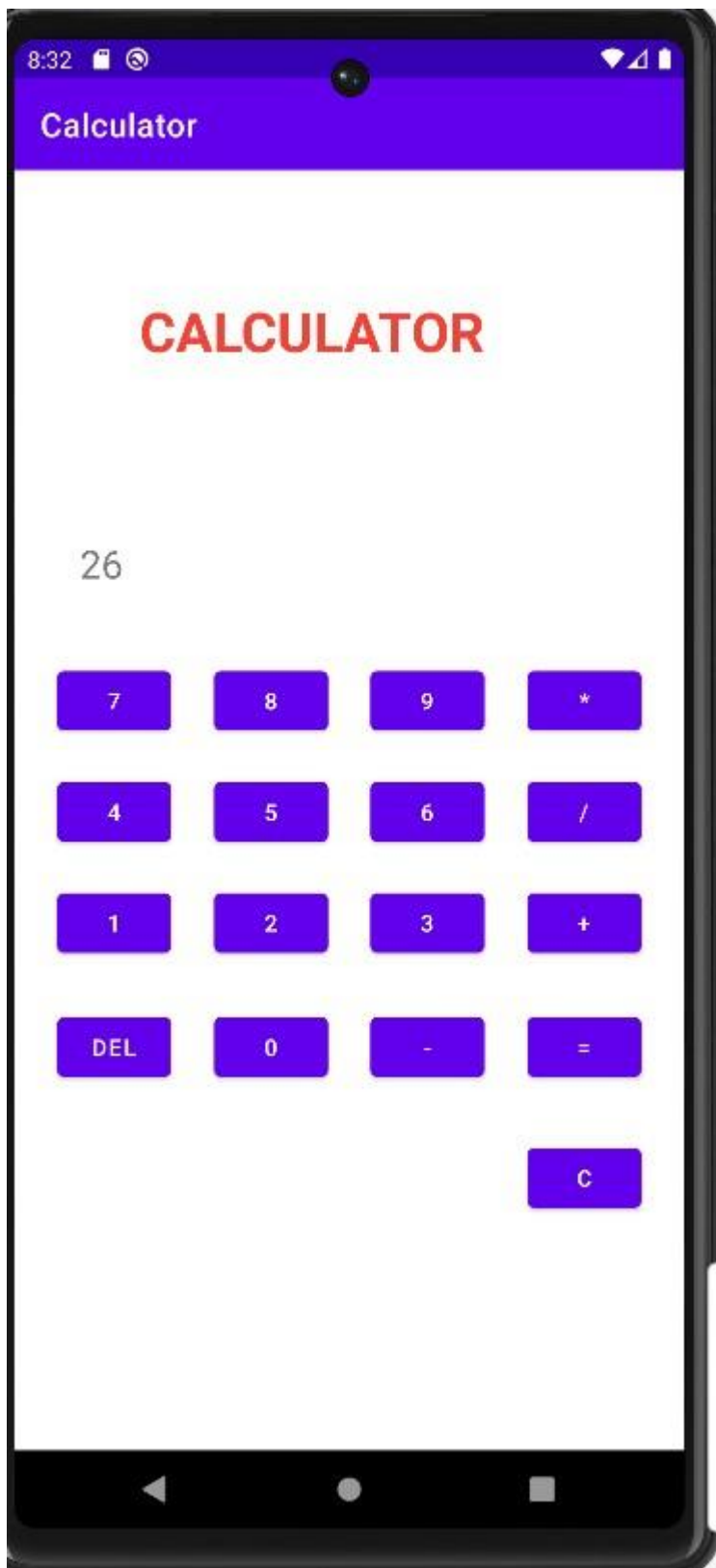
```

        expr.setText(expr.getText()+" "+t);
    }

    private void delChar(View view) {
        if(expr.getText().length() > 0){
expr.setText(expr.getText().subSequence(0,
expr.getText().length()-1));
        }
    }

    private void setValue(View v) {
        CharSequence text = ((Button) v).getText();
        if(operator.equals("")){
            opr1+=text;
        }
        else{
            opr2+=text;
        }
        expr.setText(expr.getText()+" "+text);
    }
}

```



**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 two side-by-side activity screens. The left screen is titled "SIGNUP ACTIVITY" and contains two text input fields labeled "Username:" and "Password:". Below these fields is a button labeled "SIGN UP". The right screen is titled "LOGIN ACTIVITY" and contains two text input fields labeled "Username:" and "Password:". Below these fields is a button labeled "SIGN IN". Both screens have a light gray grid background.

Signupactivity java code

```
package com.example.login;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {
    Button b1;
    EditText un;
    EditText pw;
    String unn1,pww1;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
```

```

        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        b1=findViewById(R.id.signup);
        un=findViewById(R.id.un);
        pw=findViewById(R.id.pw);

        String msg="password invalid Format";
        b1.setOnClickListener(new
View.OnClickListener() {
            @Override

            public void onClick(View view) {

                unn1=un.getText().toString();
                pww1=pw.getText().toString();
                String regex ="^(?=.*?[A-Z])(?=.*?[a-z])(?=.*?[0-9])(?=.*?[#?!@$%^&*~]).{8,}$";
                if(pww1.matches(regex)) {

                    Intent i1 = new
Intent(MainActivity.this, MainActivity2.class);
                    i1.putExtra("un", unn1);
                    i1.putExtra("pw", pww1);
                    startActivity(i1);
                }
                else

                Toast.makeText(getApplicationContext(), msg,
                Toast.LENGTH_LONG).show();
            }
        });
    }
}

```

## Login activity java code

```

package com.example.login;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;

```

```

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

public class MainActivity2 extends AppCompatActivity {
    Button b1;
    EditText un1;
    EditText pw1;
    String u1,p1;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main2);
        b1=findViewById(R.id.login);
        un1=findViewById(R.id.un1);
        pw1=findViewById(R.id.pw1);
        String msg="Invalid Password";
        String un3=getIntent().getStringExtra("un");
        String pw3=getIntent().getStringExtra("pw");
        b1.setOnClickListener(new
View.OnClickListener() {
            @Override
            public void onClick(View view) {

                u1=un1.getText().toString();
                p1=pw1.getText().toString();
                if(p1.equals(pw3) && u1.equals(un3)) {
                    Intent i2 = new
Intent(MainActivity2.this, MainActivity3.class);
                    i2.putExtra("un", un3);
                    i2.putExtra("pw", pw3);
                    startActivity(i2);
                }
                else
                {

                    Toast.makeText(getApplicationContext(), msg,
                    Toast.LENGTH_LONG).show();
                }
            }
        });
    }
}

```

```
}  
}
```

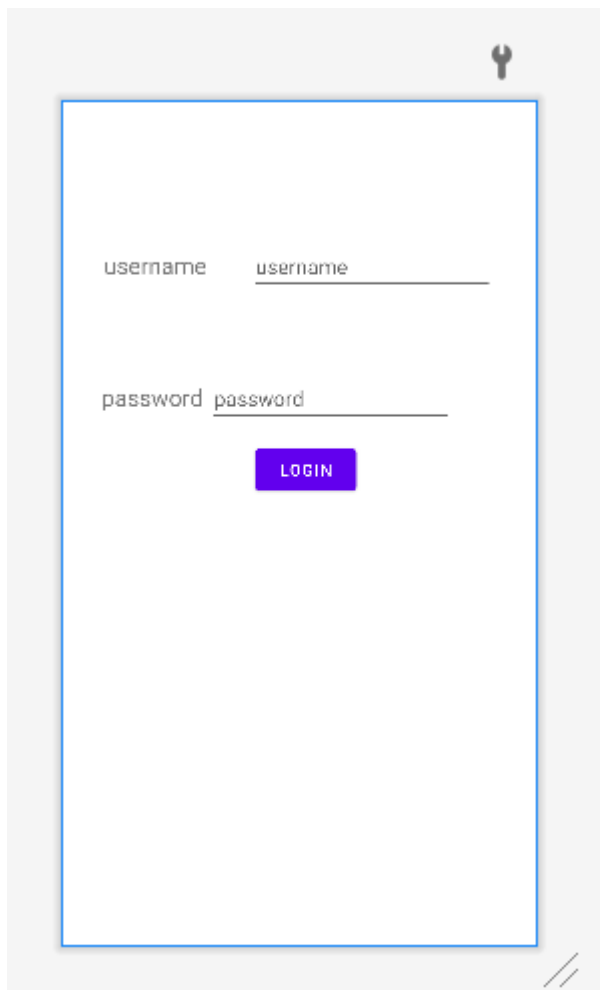
## Note:

1. Steps to create an activity

Click on project ->java (right click on this folder)->new->activity->empty activity

2. For this program two new activity should be created using the above procedure

### LOGIN

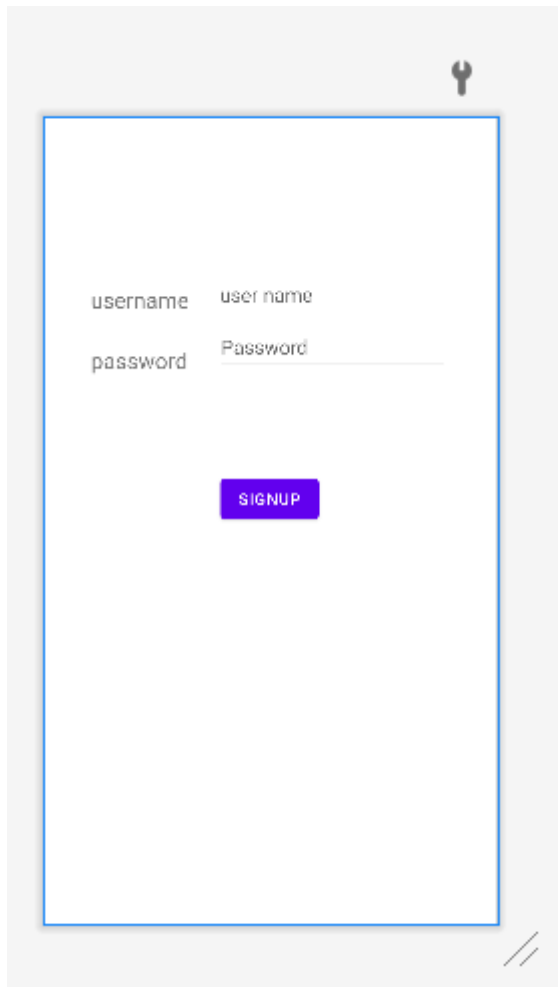


username

password

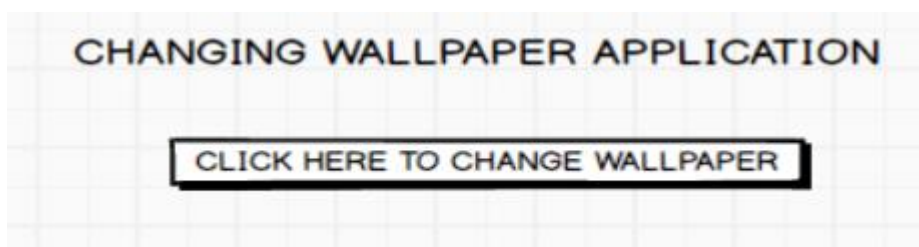
**LOGIN**

### Signup



A UI mockup of a signup form. The form is contained within a white rectangular box with a blue border, set against a light gray background. In the top right corner of the gray background, there is a small black key icon. Inside the white box, the label 'username' is followed by a text input field containing the placeholder text 'user name'. Below this, the label 'password' is followed by a text input field containing the placeholder text 'Password'. Centered below the password field is a purple rectangular button with the text 'SIGNUP' in white capital letters. In the bottom right corner of the gray background, there are two parallel diagonal lines.

**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.**





## XML CODE

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
id"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/c1"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <TextView
        android:layout_width="382dp"
        android:layout_height="60dp"
        android:text="Wall paper Program"
        android:textColor="#9C27B0"
        android:textSize="34sp"
        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"
        app:layout_constraintVertical_bias="0.095" />

    <Button
        android:id="@+id/b1"
        android:layout_width="324dp"
        android:layout_height="93dp"
        android:text="click to change wall paper"
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

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

## JAVA CODE

```

package com.example.wallpaper;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.content.ContextCompat;

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

import java.util.Random;

public class MainActivity extends AppCompatActivity {

    Button b1;
    View screenview;
    int[] back_images;
    Handler handler;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        back_images=new
int[] {R.drawable.i1,R.drawable.i2,R.drawable.i3,R.drawa
ble.i4,R.drawable.i5};
        b1=findViewById(R.id.b1);
        screenview=findViewById(R.id.c1);
        handler=new Handler();

b1.setOnClickListener(new View.OnClickListener() {
    @Override

    public void onClick(View v) {

        handler.postDelayed(runnable,0) ;
        b1.setVisibility(View.GONE);

    }
});
}

public Runnable runnable=new Runnable() {
    @Override

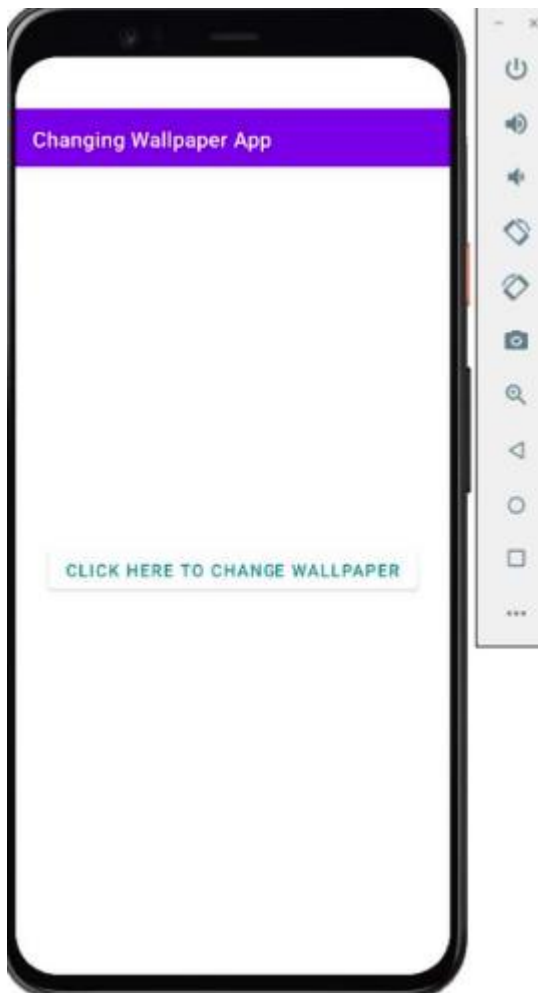
```

```

public void run() {
    Random r=new Random();

    int a_len=back_images.length;
    int rn=r.nextInt(a_len);
    screenview.setBackground(ContextCompat.
        getDrawable(getApplicationContext(),
            back_images[rn]));
    handler.postDelayed(this,3000);
}
};
}

```





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



## XML CODE

```
<?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/counter"
        android:layout_width="215dp"
        android:layout_height="97dp"
        android:hint="Counter value"
        android:textSize="34sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.133" />

    <Button
        android:id="@+id/s1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="start"
        android:textSize="34sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.529"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.346" />

    <Button
        android:id="@+id/s2"
        android:layout_width="wrap_content"
```

```

        android:layout_height="wrap_content"
        android:text="stop"
        android:textSize="34sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

```

#### JAVA CODE

```

package com.example.counter;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {
    Button s1,s2;
    TextView counter;
    int count=0;
    Handler handler;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        s1=findViewById(R.id.s1);
        s2=findViewById(R.id.s2);
        counter=findViewById(R.id.counter);
        handler=new Handler();
        s1.setOnClickListener(new
View.OnClickListener() {
            @Override
            public void onClick(View view) {
                handler.postDelayed(runnable,0);
            }
        });
        s2.setOnClickListener(new
View.OnClickListener() {
            @Override
            public void onClick(View view) {
                handler.removeCallbacks(runnable);
            }
        });
    }
}

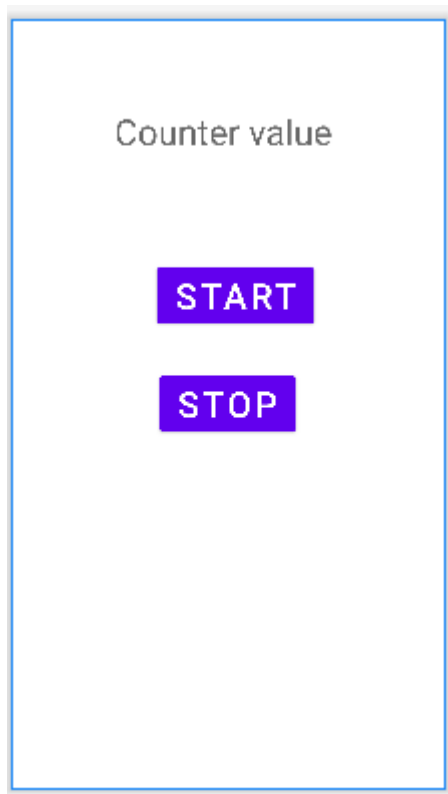
```

```

        }
    });
}

Runnable runnable=new Runnable() {
    @Override
    public void run() {
        count++;
        counter.setText(String.valueOf(count));
        handler.postDelayed(this,2000);
    }
};
}

```



**6 .Create two files of XML and JSON type with values for City\_Name, Latitude, Longitude, Temperature,andHumidity. Develop an application to create an activity with two buttons to parse the XML and JSON files which when clicked should display the data in their respective layouts side by side.**

PARSING XML AND JSON DATA		
PARSING XML AND JSON DATA		
<div>Parse XML Data</div> <div>Parse JSON Data</div>		
XML DATA		JSON Data
City_Name: Mysore		City_Name: Mysore
Latitude: 12.295		Latitude: 12.295
Longitude: 76.639		Longitude: 76.639
Temperature: 22		Temperature: 22
Humidity: 90%		Humidity: 90%

Xml code:

```
<?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">

    <LinearLayout
        android:id="@+id/linearLayout"
        android:layout_width="241dp"
        android:layout_height="298dp"
        android:orientation="vertical"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.352"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.852">

        <TextView
            android:id="@+id/t1"
            android:layout_width="match_parent"
            android:layout_height="65dp"
            android:text="TextView"
            android:textSize="20sp" />

        <TextView
            android:id="@+id/t2"
            android:layout_width="match_parent"
            android:layout_height="69dp"
```



```

        android:text="TextView"
        android:textSize="20sp" />

<TextView
    android:id="@+id/t3"
    android:layout_width="match_parent"
    android:layout_height="57dp"
    android:text="TextView"
    android:textSize="20sp" />

<TextView
    android:id="@+id/t4"
    android:layout_width="match_parent"
    android:layout_height="52dp"
    android:text="TextView"
    android:textSize="20sp" />

<TextView
    android:id="@+id/t5"
    android:layout_width="match_parent"
    android:layout_height="52dp"
    android:text="TextView"
    android:textSize="20sp" />
</LinearLayout>

<Button
    android:id="@+id/b2"
    android:layout_width="151dp"
    android:layout_height="64dp"
    android:text="XML Data"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.803"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.266" />

<Button
    android:id="@+id/b1"
    android:layout_width="144dp"
    android:layout_height="66dp"
    android:text="JSON Data"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.132"

```

```

        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.267" />

<TextView
    android:id="@+id/tt1"
    android:layout_width="170dp"
    android:layout_height="33dp"
    android:text="Click Above Button"
    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="0.394" />
</androidx.constraintlayout.widget.ConstraintLayout>

```

#### JAVA CODE

```

package com.example.jsnson;

import androidx.appcompat.app.AppCompatActivity;

import android.content.res.AssetManager;
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 {
    TextView t1,t2,t3,t4,t5,tt1;

```

```

Button b1,b2;
JSONObject city;
@Override
protected void onCreate(Bundle savedInstanceState)
{
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    t1=findViewById(R.id.t1);
    t2=findViewById(R.id.t2);
    t3=findViewById(R.id.t3);
    t4=findViewById(R.id.t4);
    t5=findViewById(R.id.t5);
    b1=findViewById(R.id.b1);
    b2=findViewById(R.id.b2);
    tt1=findViewById(R.id.tt1);
    b1.setOnClickListener(new View.OnClickListener()
    {
        @Override
        public void onClick(View view) {
            try {
                AssetManager assetManager =
getAssets();

                InputStream istream=
assetManager.open("jsondata.json");

                int size = istream.available();
                byte[] buffer = new byte[size];
                istream.read(buffer);
                istream.close();
                tt1.setText("JSON Data is");
                city = new JSONObject(new String(buffer,
"UTF-8"));
                t1.setText("City Name" +
city.getString("city_name"));
                t2.setText("Latitude:" +
city.getString("latitude"));
                t3.setText("Longitude:" +
city.getString("longitude"));
                t4.setText("Temperature:" +
city.getString("temperature"));
                t5.setText("Humidity:" +
city.getString("humidity"));
            }catch(Exception e){}
        }
    }
}

```

```

    });

    b2.setOnClickListener(new
View.OnClickListener() {
    @Override
    public void onClick(View view) {
        try {
            InputStream is =
getAssets().open("xmldata.xml");
            DocumentBuilderFactory dbfactory =
DocumentBuilderFactory.newInstance();
            DocumentBuilder dbuilder =
dbfactory.newDocumentBuilder();
            Document doc = dbuilder.parse(is);

            tt1.setText("XML Data is");
            NodeList nodeList =
doc.getElementsByTagName("city");
            Node node = nodeList.item(0);
            Element e = (Element) node;
            t1.setText("City Name:"
+e.getElementsByTagName("city_name").item(0).getTextCon
tent());

            t2.setText("Latitude:" +
e.getElementsByTagName("latitude").item(0).getTextConte
nt());

            t3.setText("Longitude: "
+e.getElementsByTagName("longitude").item(0).getTextCon
tent());

            t4.setText("Temperature: "
+e.getElementsByTagName("temperature").item(0).getTextC
ontent());

            t5.setText("Humidity: " +
e.getElementsByTagName("humidity").item(0).getTextConte
nt());

        } catch (Exception e) {}
    }
});

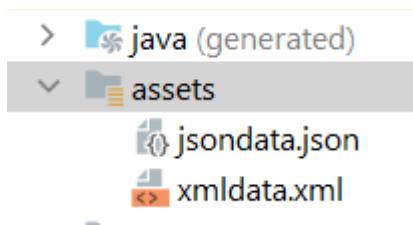
```

}

Note:

To run this app the following should be done

- 1) Click on Project ->java folder(right click)->new ->folder ->asset folder{asset folder will be created)
- 2) Under this asset folder create two files 1)XML FILE 2)JSON FILE
- 3) For creating files right click on **asset folder** new->file [you will get a box where you can give the file name and save with .xml(for xml file) and .json(for jsonfile) extensions.



Add the following code in xml and json file respectively

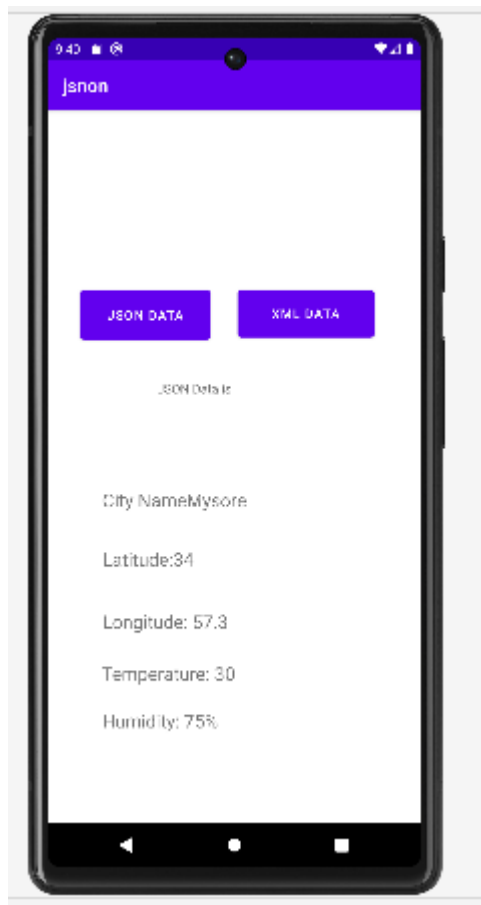
Xmldata.xml

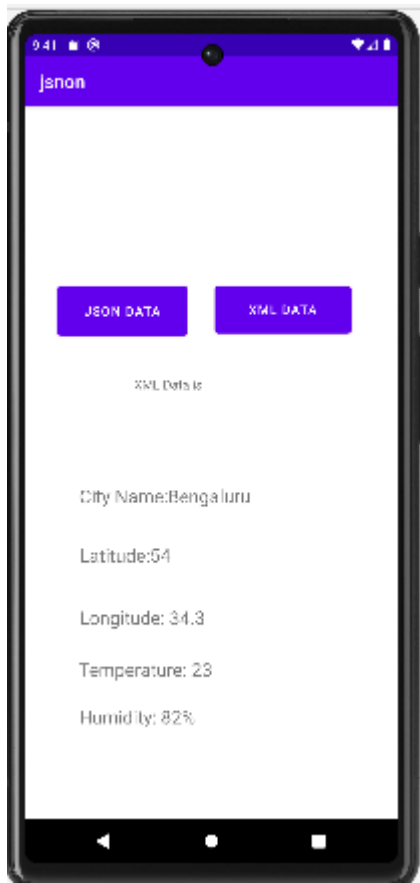
```
<?xml version="1.0" encoding="utf-8" ?>
<city>
  <city_name>Bengaluru</city_name>
  <latitude>54</latitude>
  <longitude>34.3</longitude>
  <temperature>23</temperature>
  <humidity>82%</humidity>
</city>
```

Jsondata.json

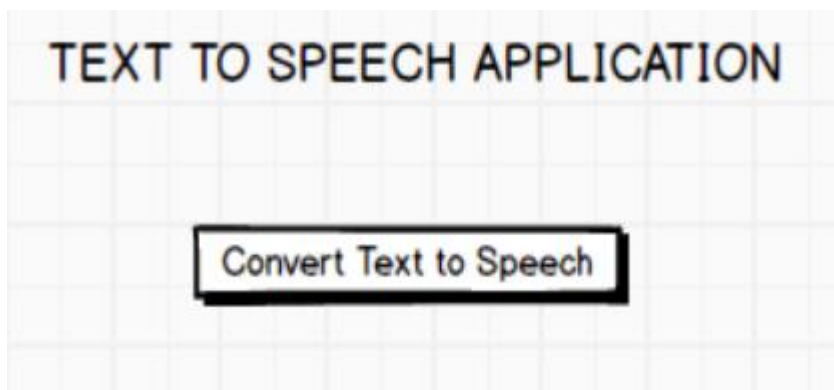
```
{
  "city_name": "Mysore",
  "latitude": "34",
  "longitude": "57.3",
  "temperature": "30",
  "humidity": "75%"
}
```

## Output





**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.**



#### XML CODE

```
<?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/b1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/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="0.354" />

<EditText
    android:id="@+id/edit1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="textPersonName"
    android:minHeight="48dp"
    android:text="@string/name"
    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="0.22"
    android:importantForAutofill="no"
    tools:ignore="LabelFor" />

</androidx.constraintlayout.widget.ConstraintLayout>

```

#### JAVA CODE

```

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 java.util.Locale;

public class MainActivity extends AppCompatActivity {
    TextToSpeech tts;
    Button b1;
    EditText et;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        b1=findViewById(R.id.b1);
        et=findViewById(R.id.editt);
        b1.setOnClickListener(new
View.OnClickListener() {
            @Override
            public void onClick(View view) {
                tts.speak(et.getText().toString(),
                    TextToSpeech.QUEUE_FLUSH,null);
            }
        });

        tts=new TextToSpeech(getApplicationContext(),
            new TextToSpeech.OnInitListener() {
                @Override
                public void onInit(int status) {

                    if(status!=TextToSpeech.ERROR)
                    {
                        tts.setLanguage(Locale.US);
                    }
                }
            });
    }
}

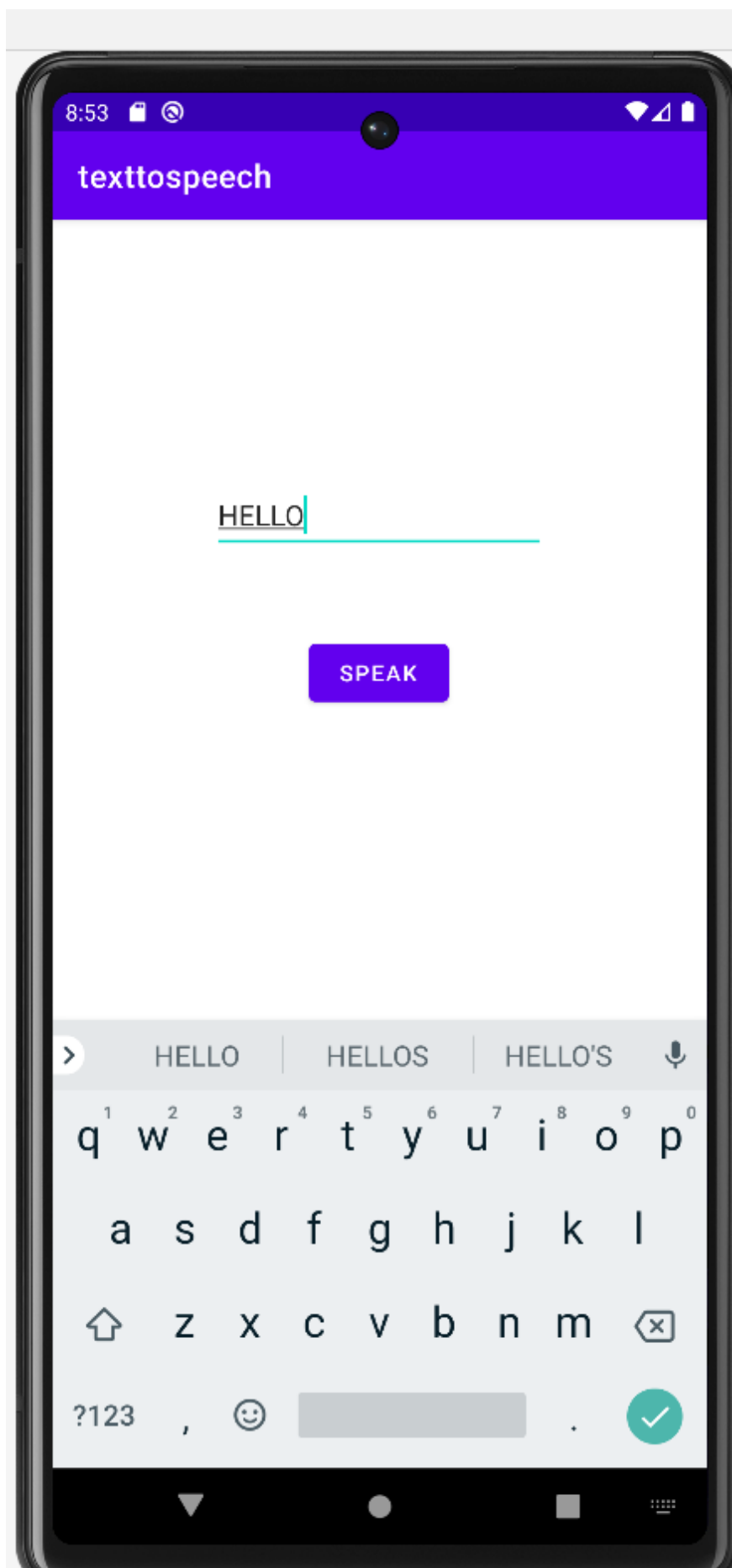
```



Name

---

SPEAK



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

XMLCODE

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:id="@+id/btn1"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:autofillHints=""
tools:context=".MainActivity">

    <Button
        android:id="@+id/btnn1"
        android:layout_width="72dp"
        android:layout_height="53dp"
        android:layout_marginTop="36dp"
        android:text="@string/_1"
        android:textSize="20sp"
        app:layout_constraintEnd_toStartOf="@+id/btn2"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toStartOf="parent"

        app:layout_constraintTop_toBottomOf="@+id/editText" />

    <Button
        android:id="@+id/btnsave"
        android:layout_width="72dp"
        android:layout_height="53dp"
        android:text="@string/save"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.5"

        app:layout_constraintStart_toEndOf="@+id/btncall"
        app:layout_constraintTop_toTopOf="@+id/btncall"
    />

    <Button
```

```

        android:id="@+id/btncall"
        android:layout_width="72dp"
        android:layout_height="53dp"
        android:layout_marginTop="52dp"
        android:text="@string/call"

app:layout_constraintEnd_toStartOf="@+id/btnsave"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toStartOf="parent"

app:layout_constraintTop_toBottomOf="@+id/btnstr" />

<Button
    android:id="@+id/btnstr"
    android:layout_width="72dp"
    android:layout_height="53dp"
    android:layout_marginTop="36dp"
    android:text="@string/star"
    android:textSize="20sp"
    app:layout_constraintEnd_toStartOf="@+id/btn0"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/btn7"

/>

<Button
    android:id="@+id/btnhash"
    android:layout_width="72dp"
    android:layout_height="53dp"
    android:text="@string/hasg"
    android:textSize="20sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/btn0"
    app:layout_constraintTop_toTopOf="@+id/btn0" />

<Button
    android:id="@+id/btn0"
    android:layout_width="72dp"
    android:layout_height="53dp"
    android:text="@string/_0"
    android:textSize="20sp"

app:layout_constraintEnd_toStartOf="@+id/btnhash"
    app:layout_constraintHorizontal_bias="0.5"

```

```
app:layout_constraintStart_toEndOf="@+id/btnstr"
    app:layout_constraintTop_toTopOf="@+id/btnstr"
/>
```

```
<Button
    android:id="@+id/btn7"
    android:layout_width="72dp"
    android:layout_height="53dp"
    android:layout_marginTop="36dp"
    android:text="@string/_7"
    android:textSize="20sp"
    app:layout_constraintEnd_toStartOf="@+id/btn8"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/btn4"
/>
```

```
<Button
    android:id="@+id/btn9"
    android:layout_width="72dp"
    android:layout_height="53dp"
    android:text="@string/_9"
    android:textSize="20sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/btn8"
    app:layout_constraintTop_toTopOf="@+id/btn8" />
```

```
<Button
    android:id="@+id/btn8"
    android:layout_width="72dp"
    android:layout_height="53dp"
    android:text="@string/_8"
    android:textSize="20sp"
    app:layout_constraintEnd_toStartOf="@+id/btn9"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/btn7"
    app:layout_constraintTop_toTopOf="@+id/btn7" />
```

```
<Button
    android:id="@+id/btn4"
    android:layout_width="72dp"
    android:layout_height="53dp"
    android:layout_marginTop="24dp"
```

```

        android:text="@string/_4"
        android:textSize="20sp"
        app:layout_constraintEnd_toStartOf="@+id/btn5"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toStartOf="parent"

app:layout_constraintTop_toBottomOf="@+id/btnn1" />

<Button
    android:id="@+id/btn6"
    android:layout_width="72dp"
    android:layout_height="53dp"
    android:text="@string/_6"
    android:textSize="20sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/btn5"
    app:layout_constraintTop_toTopOf="@+id/btn5" />

<Button
    android:id="@+id/btn5"
    android:layout_width="72dp"
    android:layout_height="53dp"
    android:text="@string/_5"
    android:textSize="20sp"
    app:layout_constraintEnd_toStartOf="@+id/btn6"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/btn4"
    app:layout_constraintTop_toTopOf="@+id/btn4" />

<Button
    android:id="@+id/btn03"
    android:layout_width="72dp"
    android:layout_height="53dp"
    android:text="@string/_3"
    android:textSize="20sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/btn2"
    app:layout_constraintTop_toTopOf="@+id/btn2" />

<Button
    android:id="@+id/btn2"
    android:layout_width="72dp"
    android:layout_height="53dp"

```

```
        android:text="@string/_2"
        android:textSize="20sp"
        app:layout_constraintEnd_toStartOf="@+id/btn03"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toEndOf="@+id/btnn1"
        app:layout_constraintTop_toTopOf="@+id/btnn1"
    />
```

```
    <EditText
        android:id="@+id/editText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="132dp"
        android:ems="10"
        android:hint="@string/number"
        android:inputType="textPersonName"
        android:minHeight="48dp"

        app:layout_constraintEnd_toStartOf="@+id/btn01"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        android:autofillHints="" />
```

```
    <Button
        android:id="@+id/btn01"
        android:layout_width="70dp"
        android:layout_height="53dp"
        android:text="@string/del"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.5"

        app:layout_constraintStart_toEndOf="@+id/editText"

        app:layout_constraintTop_toTopOf="@+id/editText" />
</androidx.constraintlayout.widget.ConstraintLayout>
```



## Java code

```
package com.example.callandsaveapp;

import
    androidx.appcompat.app.AppCompatActivity;

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.text.Editable;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity {
    Button one, two, three, four, five, six, seven,
    eight, nine, zero, star, hash, del, save, call;
    EditText etnum;
    @Override
    protected void onCreate(Bundle
savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        one = findViewById(R.id.btnn1);
        two = findViewById(R.id.btn2);
        three = findViewById(R.id.btn03);
        four = findViewById(R.id.btn4);
        five = findViewById(R.id.btn5);
        six = findViewById(R.id.btn6);
        seven = findViewById(R.id.btn7);
        eight = findViewById(R.id.btn8);
        nine = findViewById(R.id.btn9);
        zero = findViewById(R.id.btn0);
        star = findViewById(R.id.btnstr);
        hash = findViewById(R.id.btnhash);
        save = findViewById(R.id.btnsave);
    }
}
```

```

call = findViewById(R.id.btncall);
del = findViewById(R.id.btndel);
etnum = findViewById(R.id.editText);

one.setOnClickListener(this::createnum);
two.setOnClickListener(this::createnum);
three.setOnClickListener(this::createnum);
four.setOnClickListener(this::createnum);
five.setOnClickListener(this::createnum);
six.setOnClickListener(this::createnum);
seven.setOnClickListener(this::createnum);
eight.setOnClickListener(this::createnum);
nine.setOnClickListener(this::createnum);
zero.setOnClickListener(this::createnum);
hash.setOnClickListener(this::createnum);
star.setOnClickListener(this::createnum);
del.setOnClickListener(this::createnum);
save.setOnClickListener(this::createnum);
call.setOnClickListener(this::createnum);
}

```

```

private void createnum(View view) {
    Editable str;
    str = etnum.getText();
    switch (view.getId()){
        case R.id.btn0:
            str = str.append(zero.getText());
            etnum.setText(str);
            break;
        case R.id.bttn1:
            str = str.append(one.getText());
            etnum.setText(str);
            break;
        case R.id.btn2:
            str = str.append(two.getText());
            etnum.setText(str);
            break;
        case R.id.btn03:
            str = str.append(three.getText());
            etnum.setText(str);
            break;
        case R.id.btn4:
            str = str.append(four.getText());
            etnum.setText(str);

```

```

        break;
    case R.id.btn5:
        str = str.append(five.getText());
        etnum.setText(str);
        break;
    case R.id.btn6:
        str = str.append(six.getText());
        etnum.setText(str);
        break;
    case R.id.btn7:
        str = str.append(seven.getText());
        etnum.setText(str);
        break;
    case R.id.btn8:
        str = str.append(eight.getText());
        etnum.setText(str);
        break;
    case R.id.btn9:
        str = str.append(nine.getText());
        etnum.setText(str);
        break;
    case R.id.btnstr:
        str = str.append(star.getText());
        etnum.setText(str);
        break;
    case R.id.btnhash:
        str = str.append(hash.getText());
        etnum.setText(str);
        break;
    case R.id.btndel:
        str = (Editable) str.subSequence(0,
str.length()-1);
        etnum.setText(str);
        break;
    case R.id.btncall:
        if(Build.VERSION.SDK_INT >=
Build.VERSION_CODES.M &&
checkSelfPermission(Manifest.permission.CALL_PHONE)
!= PackageManager.PERMISSION_GRANTED) {
            requestPermissions(new
String[]{Manifest.permission.CALL_PHONE}, 1);
        }
        else {

```

```

        String phoneno =
etnum.getText().toString();
        Intent intentcall = new
Intent(Intent.ACTION_CALL);

intentcall.setData(Uri.parse("tel:"+phoneno));
        startActivity(intentcall);

    }
    break;

    case R.id.btnsave:
        String contact =
etnum.getText().toString();
        Intent intentsave = new
Intent(ContactsContract.Intents.SHOW_OR_CREATE Contac
T, Uri.parse("tel:"+contact));
        startActivity(intentsave);
        break;
    }
}
}

```

## ANDROIDMANIFEST.XML

```

<?xml version="1.0" encoding="utf-8"?>
<manifest
xmlns:android="http://schemas.android.com/apk/res/and
roid"
    xmlns:tools="http://schemas.android.com/tools">
<uses-permission
android:name="android.permission.CALL_PHONE"/>
<uses-permission
android:name="android.permission.WRITE_CONTACTS"/>

```

# <application

```
    android:allowBackup="true"
```

```
    android:dataExtractionRules="@xml/data_extraction_rules"

```

```
    android:fullBackupContent="@xml/backup_rules"
```

```
    android:icon="@mipmap/ic_launcher"
```

```
    android:label="@string/app_name"
```

```
    android:supportsRtl="true"
```

```
    android:theme="@style/Theme.CallAndSaveApp"
```

```
    tools:targetApi="31">
```

```
    <activity
```

```
        android:name=".MainActivity"
```

```
        android:exported="true">
```

```
        <intent-filter>
```

```
            <action
```

```
                android:name="android.intent.action.MAIN" />
```

```
            <category
```

```
                android:name="android.intent.category.LAUNCHER" />
```

```
        </intent-filter>
```

```
    </activity>
```

```
</application>
```

```
</manifest>
```

