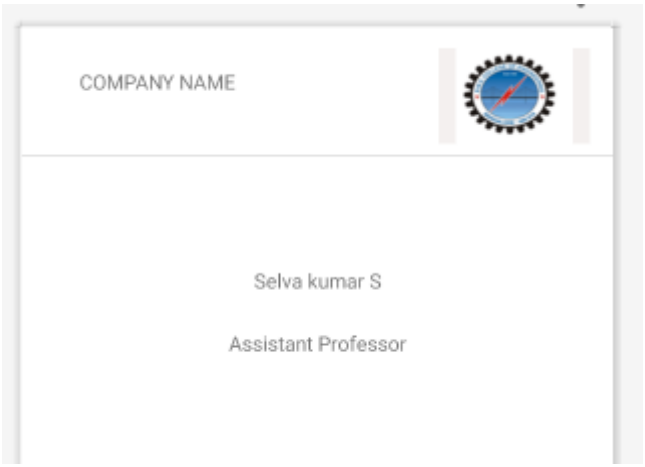
PART-A

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.



AndroidManifest.xml

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

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

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

```
</manifest>
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<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/textView2"
        android:layout_width="217dp"
        android:layout_height="37dp"
        android:layout_marginStart="40dp"
        android:layout_marginLeft="40dp"
        android:layout_marginTop="24dp"
        android:text="COMPANY NAME"
        app:layout_constraintBottom_toTopOf="@+id/divider"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.121" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="76dp"
        android:text="Selva kumar S"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/divider" />

    <View
        android:id="@+id/divider"
        android:layout_width="match_parent"
        android:layout_height="1dp"
        android:layout_marginTop="88dp"
        android:background="?android:attr/listDivider"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.0"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="105dp"
        android:layout_height="66dp"
        android:layout_marginStart="32dp"
        android:layout_marginLeft="32dp"
        android:layout_marginBottom="8dp"
        android:background="#F4F0EF"
        app:layout_constraintBottom_toTopOf="@+id/divider"
```

```
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.058"
        app:layout_constraintStart_toEndOf="@+id/textView2"
        app:srcCompat="@drawable/bmslogo" />

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="24dp"
        android:text="Assistant Professor"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView" />

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

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

XML File:

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

<android.support.constraint.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.a84.calculator.MainActivity">

<RelativeLayout

```
android:layout_width="368dp"
android:layout_height="495dp"
android:layout_marginBottom="8dp"
android:layout_marginEnd="8dp"
android:layout_marginTop="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_alignParentLeft="true"
   android:layout_alignParentStart="true"
   android:layout_below="@+id/edText1"
   android:layout_marginTop="60dp"
   android:onClick="PressOne"
   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_alignLeft="@+id/btn_4"
    android:layout_alignStart="@+id/btn_4"
    android:layout_below="@+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_alignLeft="@+id/btn_1"
    android:layout_alignStart="@+id/btn_1"
    android:layout_below="@+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_alignLeft="@+id/btn_Add"
    android:layout_alignStart="@+id/btn_Add"
    android:layout_below="@+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_alignLeft="@+id/btn_Sub"
    android:layout_alignStart="@+id/btn_Sub"
    android:layout_below="@+id/btn_6"
    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_alignLeft="@+id/btn_Mul"
```

```
    android:layout_alignStart="@+id/btn_Mul"
    android:layout_below="@+id/btn_9"
    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_alignParentEnd="true"
    android:layout_alignParentLeft="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentStart="true"
    android:layout_alignParentTop="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_toLeftOf="@+id/btn_8"
        android:layout_toStartOf="@+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_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_below="@+id/btn_Div"
        android:backgroundTint="@android:color/holo_blue_dark"
        android:text="clear"
        android:textColor="@android:color/background_light"
        android:textSize="18sp" />

  </RelativeLayout>
</android.support.constraint.ConstraintLayout>
```

Java File:

```
package com.example.a84.calculator;
```

```
import android.support.v7.app.AppCompatActivity;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;


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");
    }
});
```

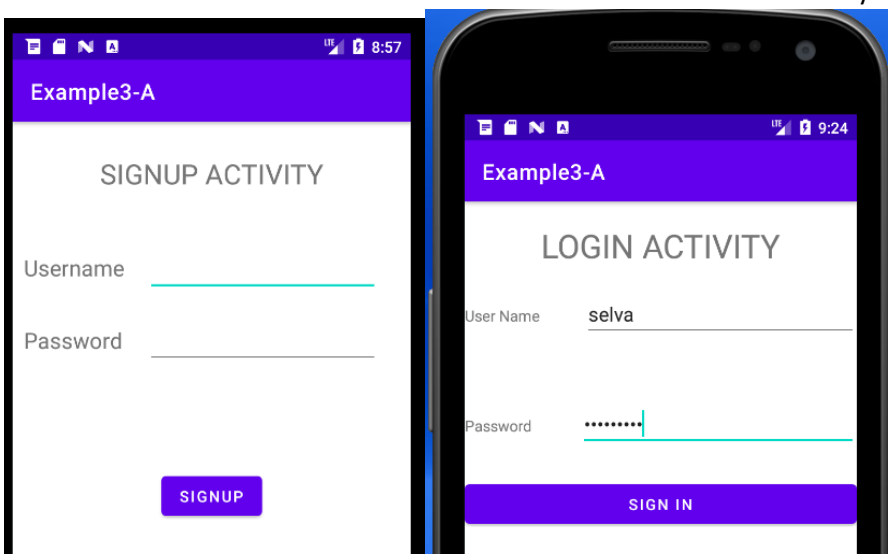
```
btn_8.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        ed1.setText(ed1.getText()+"8");
    }
});

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 {
            Value1 = Float.parseFloat(ed1.getText() + "");
            mAddition = true;
            ed1.setText(null);
```

```
        }
    }
});

btn_Sub.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Value1 = 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 “Sucessful 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.




```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.example3_a">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Example3A">
        <activity android:name=".ThirdActivity"></activity>
        <activity android:name=".SecondActivity" />
        <activity android:name=".MainActivity">
```

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

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

</manifest>
```

MainActivity:

```
package com.example.example3_a;

import android.content.Intent;
import androidx.appcompat.app.AppCompatActivity;
        import android.os.Bundle;
        import android.view.View;
        import android.widget.ArrayAdapter;
        import android.widget.Button;
        import android.widget.EditText;
        import android.widget.Spinner;
import android.widget.Toast;

import com.google.android.material.textfield.TextInputLayout;

import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity {

        //Defining the Views
        EditText e1,e2;
        Button bt;

        String name1, name2;

        // defining our own password pattern
                private static final Pattern PASSWORD_PATTERN =
                        Pattern.compile("^" +
                                "(?=.*[@#$%^&+=])" +     // at least 1 special
character
                                "(?=\\S+$)" +            // no white spaces
                                "(?=.*[A-Z])(?=.*[a-z]).*" + //upper case and
lower case letter
                                ".{8,}" +                // at least 8 characters
                                "$");
 /*                       Pattern.compile("^" +
                                "(?=.*[@#$%^&+=])" +     // at least 1 special
character
                                "(?=\\S+$)" +            // no white spaces
                                ".{8,}" +                // at least 8 characters
                                "$");*/
                private TextInputLayout editText2; //password

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

```
        //Referring the Views
        e1= (EditText) findViewById(R.id.editText);
        e2= (EditText) findViewById(R.id.editText2);

        bt= (Button) findViewById(R.id.button);

         //Creating Listener for Button
        bt.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {

        //Getting the Values from Views(Edittext & Spinner)
        name1=e1.getText().toString();
        name2=e2.getText().toString();
        //dept=s.getSelectedItem().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);
        }
        }
        });
                        }


        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;
                        }
                }
        }
```

SeconActivity.java:

```
package com.example.example3_a;
```

```
import android.content.Intent;
import androidx.appcompat.app.AppCompatActivity;
        import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

public class SecondActivity extends AppCompatActivity {

        EditText un,pwd;
        Button b1;
        String name,pass;

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

        un= (EditText) findViewById(R.id.edtUsername);
        pwd= (EditText) findViewById(R.id.edtPassword);
        b1 = (Button) findViewById(R.id.btn_signin);
         //Getting the Intent
        Intent i = getIntent();
        //Getting the Values from First Activity using the Intent received
        name=i.getStringExtra("name_key");
        pass=i.getStringExtra("reg_key");
        Toast.makeText(getApplicationContext(),name + " "
+pass,Toast.LENGTH_LONG).show();
        }


                public void validate(View view) {
                      String usn = un.getText().toString();
                        String pswd = pwd.getText().toString();
                      if( usn.equals(name) && pswd.equals(pass)) {
                              Intent i = new Intent(SecondActivity.this,
ThirdActivity.class);
                              startActivity(i);
                      }
                      else
                      {
                              Toast.makeText(getApplicationContext(),"Login
Failed",Toast.LENGTH_SHORT).show();
                      }
                }
        }
```

4. Wallpaper

Manifest.xml:

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

```
<uses-permission android:name="android.permission.SET_WALLPAPER"/>

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

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

</manifest>
```

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"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.064" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="104dp"
        android:text="Change WallPaper"
        android:onClick="ChangeImage"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView"
        app:layout_constraintVertical_bias="0.042" />
```

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

Activity.java:

```
package com.example.wallpaperchanger;

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.IOError;
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
seconds",
                        // Toast.LENGTH_SHORT).show();
            }
        }, 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(arylength);
        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();
        }
    }
}
```

5. Counter App

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="@string/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>
```

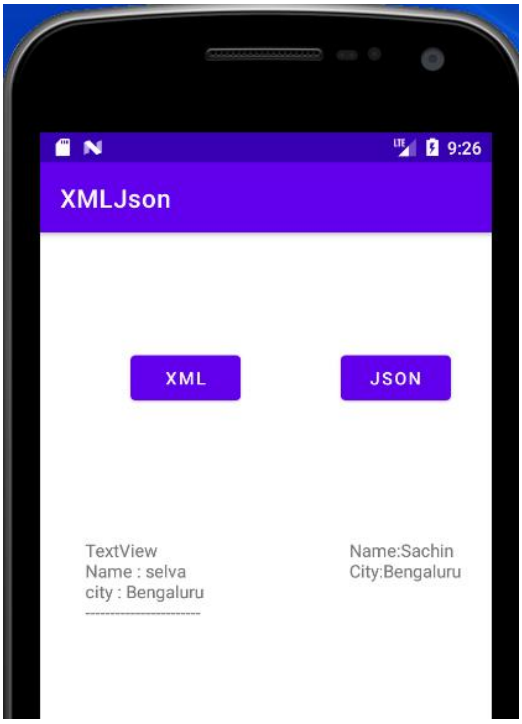
MainActivity.java:

```
package com.example.program5_a;
import android.app.Activity;
import android.os.Bundle;
import android.os.SystemClock;
import android.view.View;
import android.widget.Button;
import android.widget.Chronometer;

public class MainActivity extends Activity {
    /** Called when the activity is first created. */
    @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();

            }});
```

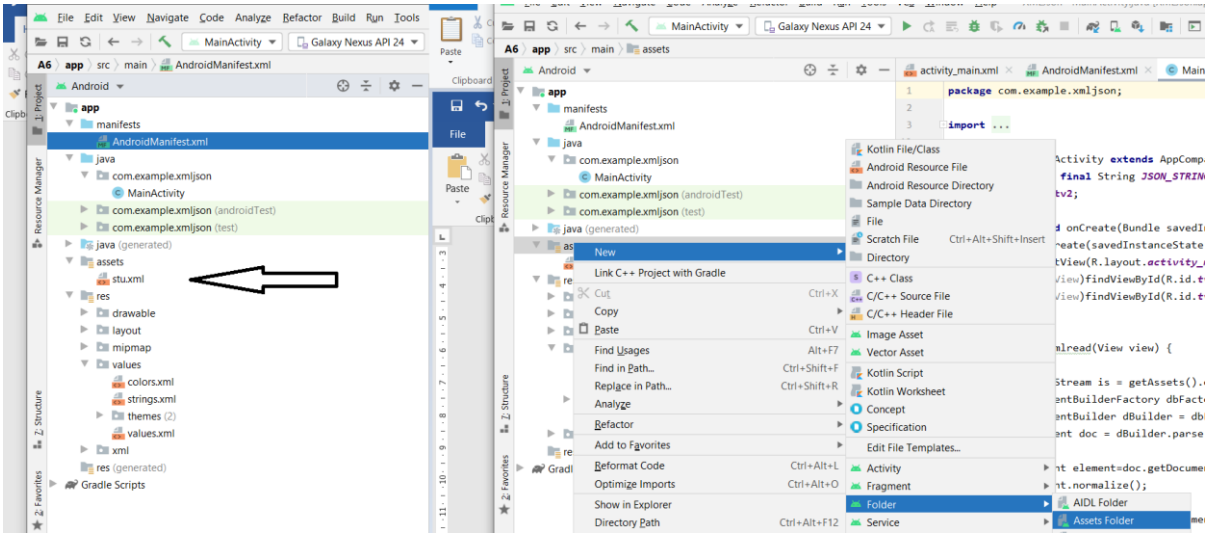
```
        buttonReset.setOnClickListener(new Button.OnClickListener(){

            @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.

https://bezkoder.com/java-android-read-json-file-assets-gson/



Create Assest folder and copy paste the xml and json file



AndroidManifest.xml

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

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.XMLJson">
        <meta-data
            android:name="com.google.android.actions"
            android:resource="@xml/actions" />

        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

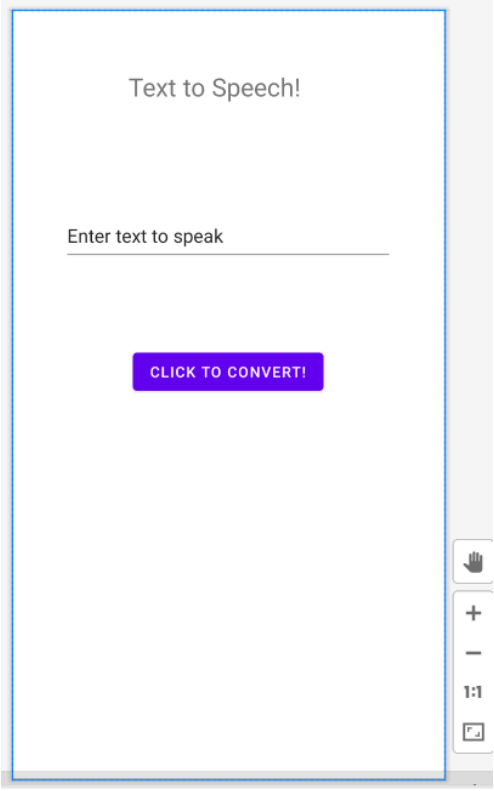
MainActivity.java

```java
package com.example.xmljson;

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

import androidx.appcompat.app.AppCompatActivity;

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;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        tv1=(TextView)findViewById(R.id.tv_xml);
        tv2=(TextView)findViewById(R.id.tv_json);
            }

    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;
                    tv1.setText(tv1.getText()+"\nName : " + getValue("name",
element2)+"\n");
                    tv1.setText(tv1.getText()+"city : " + getValue("city",
element2)+"\n");
                    tv1.setText(tv1.getText()+"----------------------");
                }
            }

        } 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 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.



AndroidManifest.xml

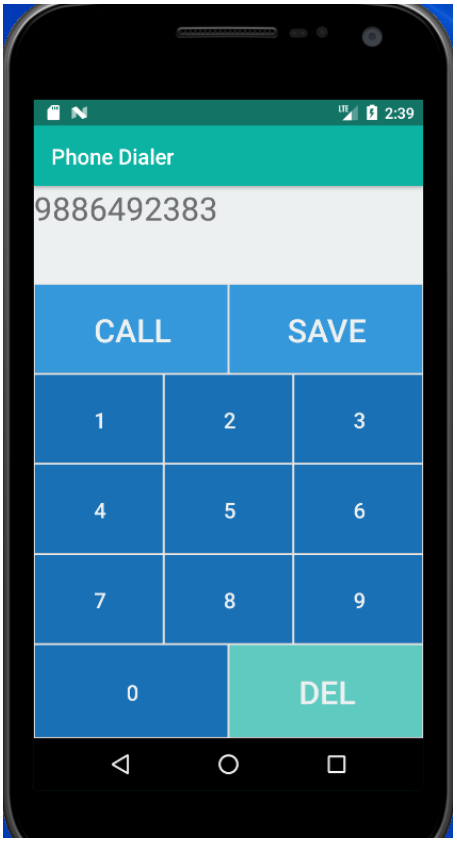
```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.texttospeech">

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

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

</manifest>
```

MainActivity.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.



AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.DataFlair.mycalculator">
    <uses-permission android:name="android.permission.CALL_PHONE" />
    <uses-permission android:name="android.intent.action.CALL_PRIVILEGED"/>
    <uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />

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

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

</manifest>
```

MainActivity.java

```
package com.DataFlair.mycalculator;

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 android.widget.Toast;


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.buttoneql);

        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);
                    }
                }
             }
        });

    }
}
```