Practical No.1

Title: Android program using various UI components

Aim: Create an application to demonstrate various UI components

Introduction

UI Elements

A **View** is an object that draws something on the screen that the user can interact with and a **ViewGroup** is an object that holds other View (and ViewGroup) objects in order to define the layout of the user interface.

You define your layout in an XML file which offers a human-readable structure for the layout, similar to HTML. For example, a simple vertical layout with a text view and a button looks like this −

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
  android:layout_width="fill_parent"
  android:layout_height="fill_parent"
  android:orientation="vertical" >

  <TextView android:id="@+id/text"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="I am a TextView" />

  <Button android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="I am a Button" />
</LinearLayout>
```

Android UI Controls

There are number of UI controls provided by Android that allow you to build the graphical user interface for your app.

Sr.No.	UI Control & Description
1	TextView

	This control is used to display text to the user.
2	EditText
	EditText is a predefined subclass of TextView that includes rich editing capabilities.
3	AutoCompleteTextView
	The AutoCompleteTextView is a view that is similar to EditText, except that it shows a list of completion suggestions automatically while the user is typing.
4	Button
	A push-button that can be pressed, or clicked, by the user to perform an action.
5	ImageButton
	An ImageButton is an AbsoluteLayout which enables you to specify the exact location of its children. This shows a button with an image (instead of text) that can be pressed or clicked by the user.
6	CheckBox
	An on/off switch that can be toggled by the user. You should use check box when presenting users with a group of selectable options that are not mutually exclusive.
7	ToggleButton
	An on/off button with a light indicator.
8	RadioButton
	The RadioButton has two states: either checked or unchecked.
9	RadioGroup
	A RadioGroup is used to group together one or more RadioButtons.
10	ProgressBar
	The ProgressBar view provides visual feedback about some ongoing tasks, such as when you are performing a task in the background.
11	Spinner

	A drop-down list that allows users to select one value from a set.
12	TimePicker
	The TimePicker view enables users to select a time of the day, in either 24-hour mode or AM/PM mode.
13	DatePicker
	The DatePicker view enables users to select a date of the day.

Exercise - Create android application to demonstrate various UI components

Implementation:
Program:
MainActivity.java

```java
package com.example.converterpromax;
import androidx.appcompat.app.AppCompatActivity;
import java.util.Calendar;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

import java.text.Format;

public class MainActivity extends AppCompatActivity {
    private Button button;
    private EditText editText;
    private TextView textView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        button = findViewById(R.id.button2);
        editText = findViewById(R.id.editTextTextPersonName2);
        textView = findViewById(R.id.textView3);

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

```java
        public void onClick(View view) {

            Calendar c = Calendar.getInstance();
            int timeOfDay = c.get(Calendar.HOUR_OF_DAY);

            if(timeOfDay >= 0 && timeOfDay < 12){
                Toast.makeText(MainActivity.this, "",
Toast.LENGTH_SHORT).show();
                Toast.makeText(MainActivity.this, "Good Morning",
Toast.LENGTH_SHORT).show();
            }else if(timeOfDay >= 12 && timeOfDay < 16){
                Toast.makeText(MainActivity.this, "Good Afternoon",
Toast.LENGTH_SHORT).show();
            }else if(timeOfDay >= 16 && timeOfDay < 21){
                Toast.makeText(MainActivity.this, "Good Evening",
Toast.LENGTH_SHORT).show();
            }else if(timeOfDay >= 21 && timeOfDay < 24){
                Toast.makeText(MainActivity.this, "Good Night",
Toast.LENGTH_SHORT).show();
            }

            Toast.makeText(MainActivity.this, "Hi",
Toast.LENGTH_SHORT).show();
            String s=editText.getText().toString();
            Float cgpa=Float.parseFloat(s);
            Double per=(7.1*cgpa)+11;

            textView.setText("Percentage is
"+String.format("%.2f",per));
        }
    });

    }
```

activity_main.xml

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

    <ImageView
        android:id="@+id/imageView2"
```

```xml
        android:layout_width="152dp"
        android:layout_height="114dp"
        app:layout_constraintBottom_toTopOf="@+id/textView2"
        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="0.807"
        app:srcCompat="@drawable/percent" />

<TextView
        android:id="@+id/textView2"
        android:layout_width="375dp"
        android:layout_height="122dp"
        android:layout_marginBottom="20dp"
        android:text="Mumbai University CGPA to % Converter"
        android:textAlignment="center"
        android:textColor="#FF5722"
        android:textSize="38sp"
        android:textStyle="bold"
        app:layout_constraintBottom_toTopOf="@+id/editTextTextPersonName2"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent" />

<EditText
        android:id="@+id/editTextTextPersonName2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="44dp"
        android:ems="10"
        android:inputType="textPersonName"
        android:text="CGPA"
        android:textSize="24sp"
        app:layout_constraintBottom_toTopOf="@+id/button2"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toStartOf="parent" />

<Button
        android:id="@+id/button2"
        android:layout_width="167dp"
        android:layout_height="65dp"
        android:layout_marginBottom="40dp"
        android:onClick="convert"
        android:text="Convert"
        android:textSize="24sp"
        app:layout_constraintBottom_toTopOf="@+id/textView3"
        app:layout_constraintEnd_toEndOf="parent"
```

```
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toStartOf="parent" />

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="88dp"
        android:inputType="number|text"
        android:text="Result"
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Output: