1. Implementing Activities using Intents.

activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
  xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">
  <EditText
     android:id="@+id/name"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:ems="10"
     android:hint="Name"
     android:inputType="textPersonName"
     android:minHeight="48dp"
     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="0.179"
     android:importantForAutofill="no"
     tools:ignore="HardcodedText" />
<Button
     android:id="@+id/login"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:text="LOGIN"
     app:layout_constraintBottom_toBottomOf="parent"
     app:layout_constraintEnd_toEndOf="parent"
     app:layout_constraintHorizontal_bias="0.498"
     app:layout_constraintStart_toStartOf="parent"
     app:layout_constraintTop_toBottomOf="@+id/name"
     app:layout_constraintVertical_bias="0.413"
```

```
    tools:ignore="HardcodedText" />
  <EditText
    android:id="@+id/pwd"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:hint="Password"
    android:inputType="textPassword"
    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="0.37"
    tools:ignore="Autofill,HardcodedText,TouchTargetSizeCheck" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

activity_sndpg.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=".secondpg">
  <TextView
    android:id="@+id/result"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/textview1"
    android:textSize="30sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.494"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
```

```
    app:layout_constraintVertical_bias="0.224"
    android:textColor="@color/black"/>
  <TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Welcome!"
    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="0.141"
    android:textSize="30sp"
    android:textColor="@color/black"
    tools:ignore="HardcodedText" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java:

```
package com.example.login;
import android.content.Intent;
import android.os.Bundle;
import android.widget.Button;
import android.widget.EditText;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
  public static final String EXTRA_TEXT =
      "com.example.application.example.EXTRA_TEXT";
  Button but;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    but = findViewById(R.id.login);
    but.setOnClickListener(v -> activity2());
  }
  public void activity2(){
```

```
    EditText editTextName= findViewById(R.id.name);
    String text =editTextName.getText().toString();
    Intent intent = new Intent(this, secondpg.class);
    intent.putExtra(EXTRA_TEXT,text);
    startActivity(intent);
  }
}
```

Secondpage.java:

```
package com.example.login;
import android.content.Intent;
import android.os.Bundle;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;
public class secondpg extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_secondpg);
    Intent intent= getIntent();
    String text= intent.getStringExtra(com.example.login.MainActivity.EXTRA_TEXT);
    TextView res= findViewById(R.id.result);
    res.setText(text);
  }
}
```

2.Develop an Application to set an image as wallpaper and on click of a button the image should start to change randomly

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">
  <ImageView
     android:id="@+id/imageView"
     android:layout_width="match_parent"
     android:layout_height="match_parent"
     android:scaleType="centerCrop" />
  <Button
     android:id="@+id/changeWallpaperButton"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_centerHorizontal="true"
     android:layout_alignParentBottom="true"
     android:layout_marginBottom="16dp"
     android:text="Change Wallpaper" />
</RelativeLayout>
```

MainActivity.java:

```
package com.example.activity.wallpaperchange;
import android.Manifest;
import android.annotation.SuppressLint;
import android.app.WallpaperManager;
import android.content.pm.PackageManager;
import android.os.Build;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.ImageView;
```

```
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;
import com.example.activity.wallpaperchange.R;
import java.io.IOException;
import java.util.Random;
public class MainActivity extends AppCompatActivity {
  private static final int REQUEST_CODE_PERMISSION = 123;
  private ImageView imageView;
  private Button changeWallpaperButton;
  private int[] wallpaperImages = {
        R.drawable.wallpaper1,
        R.drawable.wallpaper2,
        R.drawable.wallpaper3
        // Add more wallpaper images as needed
  };
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    imageView = findViewById(R.id.imageView);
    changeWallpaperButton = findViewById(R.id.changeWallpaperButton);
    // Set initial wallpaper
    setRandomWallpaper();
    // Set click listener for the button
    changeWallpaperButton.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View v) {
        // Change wallpaper on button click
        setRandomWallpaper();
      }
    });
    // Request permission if not granted
    requestPermission();
  }
  private void requestPermission() {
```

```
    if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.M &&
            ContextCompat.checkSelfPermission(this, Manifest.permission.SET_WALLPAPER)
                != PackageManager.PERMISSION_GRANTED) {
        ActivityCompat.requestPermissions(
                this,
                new String[]{Manifest.permission.SET_WALLPAPER},
                REQUEST_CODE_PERMISSION
        );
    }
  }
  @SuppressLint("MissingSuperCall")
  @Override
  public void onRequestPermissionsResult(int requestCode, @NonNull String[] permissions, @NonNull int[]
grantResults) {
    if (requestCode == REQUEST_CODE_PERMISSION && grantResults.length > 0
            && grantResults[0] == PackageManager.PERMISSION_GRANTED) {
        // Permission granted
    }
  }
  private void setRandomWallpaper() {
    // Choose a random wallpaper image
    int randomIndex = new Random().nextInt(wallpaperImages.length);
    int resourceId = wallpaperImages[randomIndex];
    // Set the chosen image as wallpaper
    try {
        WallpaperManager.getInstance(this).setResource(resourceId);
    } catch (IOException e) {
        e.printStackTrace();
    }
    // Set the chosen image in the ImageView
    imageView.setImageResource(resourceId);
  }
}
```

3.Implementing UI component using various view layout

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
  xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:orientation="vertical"
  android:padding="16dp">
  <ImageView
    android:id="@+id/profileImage"
    android:layout_width="150dp"
    android:layout_height="150dp"
    android:layout_gravity="center"
    android:layout_marginBottom="16dp"
    android:src="@drawable/ic_launcher_foreground"
    tools:ignore="ContentDescription,ImageContrastCheck" />
  <EditText
    android:id="@+id/editTextName"
    android:layout_width="375dp"
    android:layout_height="63dp"
    android:layout_marginBottom="8dp"
    android:hint="@string/name"
    tools:ignore="TextFields"
    android:importantForAutofill="no" />
  <EditText
    android:id="@+id/editTextEmail"
    android:layout_width="379dp"
    android:layout_height="59dp"
    android:layout_marginBottom="16dp"
    android:hint="Email"
    android:inputType="textEmailAddress"
    android:importantForAutofill="no"
    tools:ignore="HardcodedText" />
  <Button
```

```
    android:id="@+id/buttonSave"
    android:layout_width="289dp"
    android:layout_height="wrap_content"
    android:text="@string/save_changes" />
</LinearLayout>
```

MainActivity.java:

```
package com.example.myapplication;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.Toast;
import android.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.ttt);
    ImageView profileImage = findViewById(R.id.profileImage);
    EditText editTextName = findViewById(R.id.editTextName);
    EditText editTextEmail = findViewById(R.id.editTextEmail);
    Button buttonSave = findViewById(R.id.buttonSave);
    buttonSave.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View view) {
        String name = editTextName.getText().toString();
        String email = editTextEmail.getText().toString();
        // Save logic here (you can replace this with your actual implementation)
        // Display a toast message for demonstration purposes
        String message = "Name: " + name + "\nEmail: " + email;
        Toast.makeText(MainActivity.this, message, Toast.LENGTH_SHORT).show();
      }
    });
  }}
```

4.Develop an android application using controls like button, textview, edittext for designing a calculator having basic functionality like addition, subtraction, multiplication and division.

activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">
    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="76dp"
        android:layout_marginTop="36dp"
        android:text="Enter 2 Numbers"
        android:textAppearance="@style/TextAppearance.AppCompat.Display1"
app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
    <EditText
        android:id="@+id/num1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="92dp"
        android:layout_marginTop="156dp"
        android:ems="10"
        android:hint="Enter First Number"
        android:inputType="textPersonName"
        android:minHeight="48dp"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
    <EditText
        android:id="@+id/num2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
    android:layout_marginStart="92dp"
    android:layout_marginTop="240dp"
    android:ems="10"
    android:hint="Enter Second Number"
    android:inputType="textPersonName"
    android:minHeight="48dp"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
<Button
    android:id="@+id/add"
    android:layout_width="78dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="16dp"
    android:layout_marginTop="340dp"
    android:text="+"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
<Button
    android:id="@+id/sub"
    android:layout_width="78dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="120dp"
    android:layout_marginTop="340dp"
    android:text="-"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
<Button
    android:id="@+id/mul"
    android:layout_width="78dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="208dp"
    android:layout_marginTop="340dp"
    android:text="*"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
<Button
    android:id="@+id/clr"
```

```
        android:layout_width="100dp"
        android:layout_height="wrap_content"
        android:layout_marginStart="148dp"
        android:layout_marginTop="396dp"
        android:text="Clear"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
    <Button
        android:id="@+id/div"
        android:layout_width="78dp"
        android:layout_height="wrap_content"
        android:layout_marginStart="304dp"
        android:layout_marginTop="340dp"
        android:text="/"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="156dp"
        android:layout_marginTop="476dp"
        android:text="Result"
        android:textAppearance="@style/TextAppearance.AppCompat.Display1"
app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java:

```
package com.example.calculator;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
```

```
private EditText opr1;
private EditText opr2;
private Button btnadd;
private Button btnsub;
private Button btnmul;
private Button btndiv;
private Button btnclr;
private TextView txtresult;
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    opr1 = (EditText) findViewById(R.id.num1);
    opr2 = (EditText) findViewById(R.id.num2);
    btnadd = (Button) findViewById(R.id.add);
    btnsub = (Button) findViewById(R.id.sub);
    btnmul = (Button) findViewById(R.id.mul);
    btndiv = (Button) findViewById(R.id.div);
    btnclr = (Button) findViewById(R.id.clr);
    txtresult= (TextView) findViewById(R.id.textView2);  // Addition
    btnadd.setOnClickListener(new View.OnClickListener() {  @Override
    public void onClick(View v) {
        if((opr1.getText().length()>0) &&
                (opr2.getText().length()>0))
        {
            double oper1 =
                    Double.parseDouble(opr1.getText().toString());
            double oper2 =
                    Double.parseDouble(opr2.getText().toString());
            double result = oper1 + oper2;
            txtresult.setText(Double.toString(result));
        }
        else{
            Toast toast= Toast.makeText(MainActivity.this,"Enter  The Required Numbers",Toast.LENGTH_LONG);
            toast.show();
        }
    }
```

```
});
//Subtraction
btnsub.setOnClickListener(new View.OnClickListener() {  @Override
public void onClick(View v) {
   if((opr1.getText().length()>0) &&
         (opr2.getText().length()>0))
   {
      double oper1 =
            Double.parseDouble(opr1.getText().toString());
      double oper2 =
            Double.parseDouble(opr2.getText().toString());
      double result = oper1 - oper2;
      txtresult.setText(Double.toString(result));  }
   else{
      Toast toast= Toast.makeText(MainActivity.this,"Enter  The Required Numbers",Toast.LENGTH_LONG);
      toast.show();
   }
}
});
btnmul.setOnClickListener(new View.OnClickListener() {  @Override
public void onClick(View v) {
   if((opr1.getText().length()>0) &&
         (opr2.getText().length()>0))
   {
      double oper1 =
            Double.parseDouble(opr1.getText().toString());
      double oper2 =
            Double.parseDouble(opr2.getText().toString());
      double result = oper1 * oper2;
      txtresult.setText(Double.toString(result));
   }
   else{
      Toast toast= Toast.makeText(MainActivity.this,"Enter  The Required Numbers",Toast.LENGTH_LONG);
      toast.show();
   }
}
});
```

```
    btndiv.setOnClickListener(new View.OnClickListener() {  @Override
    public void onClick(View v) {
       if((opr1.getText().length()>0) &&
            (opr2.getText().length()>0))
       {
          double oper1 =
               Double.parseDouble(opr1.getText().toString());
          double oper2 =
               Double.parseDouble(opr2.getText().toString());
          double result = oper1 / oper2;
          txtresult.setText(Double.toString(result));
       }
       else{
          Toast toast= Toast.makeText(MainActivity.this,"Enter  The Required Numbers",Toast.LENGTH_LONG);
          toast.show();
       }
    }
    });
    btnclr.setOnClickListener(new View.OnClickListener() {  @Override
    public void onClick(View v) {
       opr1.setText("");
       opr2.setText("");
       txtresult.setText("0.00");
       opr1.requestFocus();
    }
    });

  }
}
```

5.Exercise using controls like Radiogroup,Button and Checkbox.

Layout.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:orientation="vertical"
  android:layout_width="match_parent"
  android:layout_height="match_parent">
  <TextView
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:text="select your subject"
     android:textStyle="bold"
     android:textSize="30dp"
     tools:ignore="HardcodedText,SpUsage" />
  <CheckBox
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:id="@+id/tam"
     android:text="Tamil"
     android:textSize="25dp"
     tools:ignore="HardcodedText,SpUsage">
  </CheckBox>
  <CheckBox
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:id="@+id/eng"
     android:text="English"
     android:textSize="25dp"
     tools:ignore="HardcodedText,SpUsage">
  </CheckBox>
  <CheckBox
     android:id="@+id/social"
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:text="Social"
```

```
    android:textSize="25dp"
    tools:ignore="HardcodedText,SpUsage,TextSizeCheck">
</CheckBox>
<CheckBox
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/sci"
    android:text="Science"
    android:textSize="25dp"
    tools:ignore="HardcodedText,SpUsage">
</CheckBox>
<TextView
    android:id="@+id/gender"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Select your Gender"
    android:textSize="30dp"
    android:textStyle="bold"
    tools:ignore="HardcodedText,SpUsage" />
<RadioGroup
    android:id="@+id/rgGender"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
    <RadioButton
        android:id="@+id/male"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="Male"
        android:textSize="25dp"
        tools:ignore="HardcodedText,SpUsage,TextSizeCheck" />
    <RadioButton
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:id="@+id/female"
```

```
        android:text="Female"
        android:textSize="25dp"
        tools:ignore="HardcodedText,SpUsage" />
  </RadioGroup>
  <Button
     android:layout_width="100dp"
     android:layout_height="50dp"
     android:id="@+id/subBtn"
     android:text="Submit"
     android:gravity="center"
     android:layout_gravity="center"
     tools:ignore="HardcodedText" />
</LinearLayout>
```

MainActivity.java:

```
package com.example.exercise5;
import androidx.appcompat.app.AppCompatActivity;
import android.annotation.SuppressLint;
import android.os.Bundle;
import android.util.Log;
import android.widget.CheckBox;
import android.widget.CompoundButton;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
  String TAG=MainActivity.class.getName();
  private CheckBox tam,eng,social,sci;
  private RadioGroup gender;
  @SuppressLint({"MissingSuperCall", "MissingInflatedId"})
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.layout);
        tam=findViewById(R.id.tam);
        eng=findViewById(R.id.eng);
        social=findViewById(R.id.social);
```

```
        sci=findViewById(R.id.sci);
        tam.setOnCheckedChangeListener(new CompoundButton.OnCheckedChangeListener() {
            @Override
            public void onCheckedChanged(CompoundButton compoundButton, boolean b) {
                Log.d(TAG,tam.getText().toString()+"status"+b);
                Toast.makeText(getApplicationContext(),tam.getText().toString()+" "+b,Toast.LENGTH_LONG).show();
            }
        });
        eng.setOnCheckedChangeListener(new CompoundButton.OnCheckedChangeListener() {
            @Override
            public void onCheckedChanged(CompoundButton compoundButton, boolean b) {
                Log.d(TAG,eng.getText().toString()+"status"+b);
                Toast.makeText(getApplicationContext(),eng.getText().toString()+" "+b,Toast.LENGTH_LONG).show();
            }
        });
        gender=findViewById(R.id.rgGender);
        gender.setOnCheckedChangeListener((radioGroup, i) -> {
            RadioButton radioButton=gender.findViewById(i);
            String selectedstr=radioButton.getText().toString();
            Toast.makeText(MainActivity.this, "Yourselection is"+selectedstr,Toast.LENGTH_LONG).show();});
    }
}
```

6.Exercise using ProgressBar view and spinner View

activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:paddingLeft="16dp"
  android:paddingTop="16dp"
  android:paddingRight="16dp"
  android:paddingBottom="16dp"
  tools:context=".MainActivity">

  <ProgressBar
     android:id="@+id/progressBar"
     style="?android:attr/progressBarStyleHorizontal"
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:layout_centerVertical="true"
     android:layout_marginTop="20dp"/>

  <Spinner
     android:id="@+id/spinner"
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:layout_below="@id/progressBar"
     android:layout_marginTop="20dp"/>
</RelativeLayout>
```

MainActivity.java:

```
package com.example.record6;

import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
```

```
import android.widget.ProgressBar;
import android.widget.Spinner;

import androidx.appcompat.app.AppCompatActivity;

import com.example.record6.R;

public class MainActivity extends AppCompatActivity {

  private ProgressBar progressBar;
  private Spinner spinner;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);

     // Initialize views
     progressBar = findViewById(R.id.progressBar);
     spinner = findViewById(R.id.spinner);

     // Set up spinner with sample data
     String[] spinnerItems = {"Level 1", "Level 2", "Level 3", "Level 4", "Level 5"};
     ArrayAdapter<String> adapter = new ArrayAdapter<>(this, android.R.layout.simple_spinner_dropdown_item,
spinnerItems);
     spinner.setAdapter(adapter);

     // Set a listener for spinner item selection
     spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
        @Override
        public void onItemSelected(AdapterView<?> parentView, View selectedItemView, int position, long id) {
           // Update progress bar based on the selected item
           int progress = (position + 1) * 20;
           progressBar.setProgress(progress);
        }

        @Override
        public void onNothingSelected(AdapterView<?> parentView) {
```

```
            // Do nothing here
        }
    });
  }
}
```

7. Exercise using ImageView and TextView.

activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:background="@color/teal_200"
  tools:context=".MainActivity">
  <!-- ImageView to display an image -->
  <ImageView
    android:id="@+id/myImageView"
    android:layout_width="200dp"
    android:layout_height="200dp"
    android:layout_alignParentTop="true"
    android:layout_centerHorizontal="true"
    android:layout_marginTop="50dp"
    android:src="@drawable/img1" />
  <!-- TextView to display text -->
  <TextView
    android:id="@+id/myTextView"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@id/myImageView"
    android:layout_alignParentStart="true"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginStart="20dp"
    android:layout_marginTop="103dp"
    android:layout_marginEnd="15dp"
    android:layout_marginBottom="342dp"
    android:text="WELCOME TO ANDROID STUDIO !"
    android:textColor="@color/black"
    android:textSize="25sp" />
</RelativeLayout>
```

MainActivity.java:

```
package com.example.textviewandimage;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import com.example.textviewandimage.R;
public class MainActivity extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
  }
}
```

8. Develop an application in android that makes use of notification manager.

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:padding="16dp"
  tools:context=".MainActivity">
   <Button
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_centerInParent="true"
     android:text="Send Notification"
     android:onClick="sendNotification"/>
</RelativeLayout>
```

MainActivity.java:

```
package com.example.program8;
import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.content.Context;
import android.os.Build;
import android.os.Bundle;
import android.view.View;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.NotificationCompat;
import com.example.program8.R;

public class MainActivity extends AppCompatActivity {

  private static final String CHANNEL_ID = "my_channel";
  private static final CharSequence CHANNEL_NAME = "My Channel";
```

```
  private static final String CHANNEL_DESCRIPTION = "This is my notification channel";

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

    createNotificationChannel();
  }

  private void createNotificationChannel() {
    if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
      NotificationChannel channel = new NotificationChannel(
          CHANNEL_ID,
          CHANNEL_NAME,
          NotificationManager.IMPORTANCE_DEFAULT);
      channel.setDescription(CHANNEL_DESCRIPTION);
      NotificationManager notificationManager = getSystemService(NotificationManager.class);
      notificationManager.createNotificationChannel(channel);
    }
  }

  public void sendNotification(View view) {
    NotificationCompat.Builder builder = new NotificationCompat.Builder(this, CHANNEL_ID)
        .setSmallIcon(R.drawable.ic_notification)
        .setContentTitle("My Notification")
        .setContentText("This is a notification from my app")
        .setPriority(NotificationCompat.PRIORITY_DEFAULT);

    NotificationManager notificationManager = (NotificationManager)
getSystemService(Context.NOTIFICATION_SERVICE);
    notificationManager.notify(1, builder.build());
  }
}
```

9. Create a Stopwatch application using android studio.

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:layout_gravity="center"
  android:gravity="center"
```

```
  android:orientation="vertical"
  tools:context=".MultiTaskActivity">
  <Button
     android:id="@+id/txtStopWatch"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_marginTop="?actionBarSize"
     android:text="Stop Watch"
     app:layout_constraintEnd_toEndOf="parent"
     app:layout_constraintStart_toStartOf="parent"
     app:layout_constraintTop_toTopOf="parent" />
</LinearLayout>
```

Activity_stopwatch.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:background="#0F9D58"
  android:layout_gravity="center"
  android:gravity="center"
  android:orientation="vertical"
  android:padding="16dp">
  <TextView
     android:id="@+id/time_view"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_gravity="center_horizontal"
     android:textAppearance="@android:style/TextAppearance.Large"
     android:textSize="56sp" />
  <Button
     android:id="@+id/start_button"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_gravity="center_horizontal"
     android:layout_marginTop="20dp"
     android:onClick="onClickStart"
     android:text="Start" />
 <Button
     android:id="@+id/stop_button"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_gravity="center_horizontal"
     android:layout_marginTop="8dp"
     android:onClick="onClickStop"
     android:text="Stop" />
  <Button
     android:id="@+id/reset_button"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
```

```
    android:layout_gravity="center_horizontal"
    android:layout_marginTop="8dp"
    android:onClick="onClickReset"
    android:text="Reset" />
</LinearLayout>
```

StopWatchActivity.java:

```
package com.example.activity.myapplication;
import android.content.Intent;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import androidx.annotation.Nullable;
import androidx.appcompat.app.AppCompatActivity;
import java.util.Locale;
public class StopwatchActivity extends AppCompatActivity {
  private int seconds = 0;
  // Is the stopwatch running?
  private boolean running;
  private boolean wasRunning;
  @Override
  protected void onCreate(@Nullable Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_stopwatch);
    if (savedInstanceState != null) {
      // Get the previous state of the stopwatch
      // if the activity has been
      // destroyed and recreated.
      seconds = savedInstanceState.getInt("seconds");
      running = savedInstanceState.getBoolean("running");
      wasRunning = savedInstanceState.getBoolean("wasRunning");
    }
    runTimer();
  }
  private void runTimer() {

    final TextView timeView = (TextView) findViewById(R.id.time_view);
    Handler handler = new Handler();
    handler.post(new Runnable() {
      @Override
      public void run() {
        int hours = seconds / 3600; //3600=1 hr
        int minutes = (seconds % 3600) / 60;
        int secs = seconds % 60;
        String time = String.format(Locale.getDefault(), "%d:%02d:%02d", hours,
            minutes, secs);
        timeView.setText(time);
        if (running) {
```

```
            seconds++;
        }
        // Post the code again
        // with a delay of 1 second.
        handler.postDelayed(this, 1000);
      }
   });
}
@Override
public void onSaveInstanceState(Bundle savedInstanceState) {
   super.onSaveInstanceState(savedInstanceState);
   savedInstanceState.putInt("seconds", seconds);
   savedInstanceState.putBoolean("running", running);
   savedInstanceState.putBoolean("wasRunning", wasRunning);
}
@Override
protected void onPause() {
   super.onPause();
   wasRunning = running;
   running = false;
}
// If the activity is resumed,
// start the stopwatch
// again if it was running previously.
@Override
protected void onResume() {
   super.onResume();
   if (wasRunning) {
      running = true;
   }
}
// Start the stopwatch running
// when the Start button is clicked.
// Below method gets called
// when the Start button is clicked.
public void onClickStart(View view) {
   running = true;
}
// Stop the stopwatch running
// when the Stop button is clicked.
// Below method gets called
// when the Stop button is clicked.
public void onClickStop(View view) {
   running = false;
}
// Reset the stopwatch when
// the Reset button is clicked.
// Below method gets called
// when the Reset button is clicked.
```

```
  public void onClickReset(View view) {
    running = false;
    seconds = 0;
  }
}
```

MainActivity.java:

```
package com.example.activity.myapplication;
import android.content.Intent;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import androidx.annotation.Nullable;
import androidx.appcompat.app.AppCompatActivity;
import java.util.Locale;
public class StopwatchActivity extends AppCompatActivity {
  private int seconds = 0;
  // Is the stopwatch running?
  private boolean running;
  private boolean wasRunning;
  @Override
  protected void onCreate(@Nullable Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_stopwatch);
    if (savedInstanceState != null) {
      // Get the previous state of the stopwatch
      // if the activity has been
      // destroyed and recreated.
      seconds = savedInstanceState.getInt("seconds");
      running = savedInstanceState.getBoolean("running");
      wasRunning = savedInstanceState.getBoolean("wasRunning");
    }
    runTimer();
  }
  private void runTimer() {

    final TextView timeView = (TextView) findViewById(R.id.time_view);
    Handler handler = new Handler();
    handler.post(new Runnable() {
      @Override
      public void run() {
        int hours = seconds / 3600; //3600=1 hr
        int minutes = (seconds % 3600) / 60;
        int secs = seconds % 60;
        String time = String.format(Locale.getDefault(), "%d:%02d:%02d", hours,
            minutes, secs);
        timeView.setText(time);
        if (running) {
```

```
            seconds++;
        }
        // Post the code again
        // with a delay of 1 second.
        handler.postDelayed(this, 1000);
      }
   });
}
@Override
public void onSaveInstanceState(Bundle savedInstanceState) {
   super.onSaveInstanceState(savedInstanceState);
   savedInstanceState.putInt("seconds", seconds);
   savedInstanceState.putBoolean("running", running);
   savedInstanceState.putBoolean("wasRunning", wasRunning);
}
@Override
protected void onPause() {
   super.onPause();
   wasRunning = running;
   running = false;
}
// If the activity is resumed,
// start the stopwatch
// again if it was running previously.
@Override
protected void onResume() {
   super.onResume();
   if (wasRunning) {
      running = true;
   }
}
// Start the stopwatch running
// when the Start button is clicked.
// Below method gets called
// when the Start button is clicked.
public void onClickStart(View view) {
   running = true;
}
// Stop the stopwatch running
// when the Stop button is clicked.
// Below method gets called
// when the Stop button is clicked.
public void onClickStop(View view) {
   running = false;
}
// Reset the stopwatch when
// the Reset button is clicked.
// Below method gets called
// when the Reset button is clicked.
```

```
  public void onClickReset(View view) {
    running = false;
    seconds = 0;
  }
}
```

10. Exercise using Action bar, menus and adding menu items.

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout 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">
  <androidx.appcompat.widget.Toolbar
    android:id="@+id/toolbar"
    android:layout_width="match_parent"
    android:layout_height="?attr/actionBarSize"
    android:background="?attr/colorPrimary"/>
  <androidx.constraintlayout.widget.ConstraintLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <TextView
      android:id="@+id/textView2"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_marginBottom="348dp"
      android:foregroundTint="#E33C3C"
      android:text="ACTION BAR AND MENU ITEMS"
      android:textColor="#14ACF1"
      android:textSize="24sp"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintHorizontal_bias="0.492"
      app:layout_constraintStart_toStartOf="parent" />
  </androidx.constraintlayout.widget.ConstraintLayout>
```

```
</RelativeLayout>
```

Main_menu.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto">
  <item
    android:id="@+id/action_devicecare"
    android:title="Device care"
    app:showAsAction="never"/>
  <item
    android:id="@+id/action_themes"
    android:title="Themes"
    app:showAsAction="never"/>
  <item
    android:id="@+id/action_settings"
    android:title="Settings"
    app:showAsAction="never"/>
</menu>
```

MainActivity.java:

```
package com.example.prgm10;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
import androidx.appcompat.widget.Toolbar;
public class MainActivity extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);

    Toolbar toolbar = findViewById(R.id.toolbar);
    setSupportActionBar(toolbar);
  }
```

```
  @Override
  public boolean onCreateOptionsMenu(Menu menu) {
     MenuInflater inflater = getMenuInflater();
     inflater.inflate(R.menu.main_menu, menu);
     return true;
  }
  @Override
  public boolean onOptionsItemSelected(MenuItem item) {
     // Handle item selection
     switch (item.getItemId()) {
        case R.id.action_devicecare:
           showToast("Device care selected");
           return true;
        case R.id.action_themes:
           showToast("Themes selected");
           return true;
        case R.id.action_settings:
           showToast("Settings selected");
           return true;
        default:
           return super.onOptionsItemSelected(item);
     }
  }
  private void showToast(String message) {
     Toast.makeText(this, message, Toast.LENGTH_SHORT).show();
  }
}
```

AndroidManifest.xml:

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

  <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.AppCompat.Light.NoActionBar"       **********
    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>
```

11.Exercise using saving and loading user preferences.

Activity_main.xml:

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:padding="16dp"
  tools:context=".MainActivity">
  <TextView
    android:id="@+id/tv_language"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Preferred Language:"
    android:textSize="18sp"
    android:layout_marginTop="16dp" />
  <Spinner
    android:id="@+id/spinner_language"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
```

```
    android:layout_below="@id/tv_language"
    android:layout_marginTop="8dp" />
  <TextView
    android:id="@+id/tv_font_size"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Preferred Font Size:"
    android:textSize="18sp"
    android:layout_below="@id/spinner_language"
    android:layout_marginTop="16dp" />
  <SeekBar
    android:id="@+id/seekBar_font_size"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@id/tv_font_size"
    android:layout_marginTop="8dp"
    android:max="30"
    android:progress="18" />
  <Button
    android:id="@+id/btn_save"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Save Preferences"
    android:layout_below="@id/seekBar_font_size"
    android:layout_centerHorizontal="true"
    android:layout_marginTop="24dp" />

</RelativeLayout>
```

arrays.xml:

```
<resources>
  <string-array name="languages_array">
    <item>English</item>
    <item>Spanish</item>
    <item>French</item>
    <item>German</item>
```

```
    <item>Chinese</item>
  </string-array>
</resources>
```

MainActivity.java:

```
package com.example.activity.program10;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.SeekBar;
import android.widget.Spinner;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
  private Spinner spinnerLanguage;
  private SeekBar seekBarFontSize;
  private Button btnSave;
  private SharedPreferences preferences;
  private static final String PREF_NAME = "user_preferences";
  private static final String KEY_LANGUAGE = "preferred_language";
  private static final String KEY_FONT_SIZE = "preferred_font_size";
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    spinnerLanguage = findViewById(R.id.spinner_language);
    seekBarFontSize = findViewById(R.id.seekBar_font_size);
    btnSave = findViewById(R.id.btn_save);
    // Set up spinner with language options
    ArrayAdapter<CharSequence> adapter = ArrayAdapter.createFromResource(this,
        R.array.languages_array, android.R.layout.simple_spinner_item);
    adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
    spinnerLanguage.setAdapter(adapter);
    preferences = getSharedPreferences(PREF_NAME, MODE_PRIVATE);
    // Load preferences
    loadPreferences();
    btnSave.setOnClickListener(v -> savePreferences());
```

```
    }
    private void loadPreferences() {
        String language = preferences.getString(KEY_LANGUAGE, "");
        int fontSize = preferences.getInt(KEY_FONT_SIZE, 18);

        // Set saved preferences
        spinnerLanguage.setSelection(getIndex(spinnerLanguage, language));
        seekBarFontSize.setProgress(fontSize);
    }
    private void savePreferences() {
        String selectedLanguage = spinnerLanguage.getSelectedItem().toString();
        int selectedFontSize = seekBarFontSize.getProgress();
        // Save preferences
        SharedPreferences.Editor editor = preferences.edit();
        editor.putString(KEY_LANGUAGE, selectedLanguage);
        editor.putInt(KEY_FONT_SIZE, selectedFontSize);
        editor.apply();
        Toast.makeText(this, "Preferences saved successfully", Toast.LENGTH_SHORT).show();
    }
    private int getIndex(Spinner spinner, String value) {
        for (int i = 0; i < spinner.getCount(); i++) {
            if (spinner.getItemAtPosition(i).toString().equalsIgnoreCase(value)) {
                return i;
            }
        }
        return 0;
    }
}
```

12. Create SQLite database using dbadapter helper

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
```

```
android:layout_width="match_parent"
android:layout_height="match_parent"
android:orientation="vertical"
tools:context=".MainActivity">
<TextView
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:text="Enter Name"
android:textSize="30dp"/>
<EditText
android:id="@+id/edttxtname"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:textSize="30dp"
tools:ignore="SpeakableTextPresentCheck" />
<TextView
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:text="Enter Age"
android:textSize="30dp"/>
<EditText
android:id="@+id/edttxtage"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:textSize="30dp"
tools:ignore="SpeakableTextPresentCheck" />
<Button
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:id="@+id/btnsave"
android:text="Save"/>
</LinearLayout>
```

MainActivity.java:

```
package com.example.database;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Context;
```

```
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import com.example.database.R;
public class MainActivity extends AppCompatActivity {
SQLiteDatabase db;
Button btnsave;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
btnsave=(Button)findViewById(R.id.btnsave);
EditText edttxtname = (EditText) findViewById(R.id.edttxtname);
EditText edttxtage = (EditText) findViewById(R.id.edttxtage);
db=openOrCreateDatabase("StudentDB", Context.MODE_PRIVATE,null);
db.execSQL("CREATE TABLE IF NOT EXISTS Student1(Name VARCHAR,Age
VARCHAR);");
btnsave.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
//Toast.makeText(getApplicationContext(),"Database Created",Toast.LENGTH_LONG).show();
db.execSQL("INSERT INTO Student1 VALUES( '"+edttxtname.getText()+"','"+
edttxtage.getText()+"');");
Toast.makeText(getApplicationContext(),"Record Inserted",Toast.LENGTH_LONG).show();
}});
}}
```

13. Perform CURD (create, update, read, delete) operations

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
```

```
android:layout_height="match_parent"
android:orientation="vertical"
tools:context=".MainActivity">

<TextView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Enter Roll.No"
    android:textSize="30dp"
    />
<EditText
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/edttxtrollno"
    android:textSize="30dp"
    />

<TextView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Enter Name"
    android:textSize="30dp"
    />
<EditText
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/edttxtname"
    android:textSize="30dp"
    />

<TextView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Enter Age"
    android:textSize="30dp"
    />
<EditText
```

```
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/edttxtage"
    android:textSize="30dp"
    />
  <Button
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/btnsave"
    android:text="Save"
    />

  <Button
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/btnDelete"
    android:text="Delete"
    />
  <Button
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/btnView"
    android:text="View"
    />

  <Button
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/btnModify"
    android:text="Modify"
    />
</LinearLayout>
```

MainActivity.java:

```
package com.example.myapplication1;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Context;
```

```
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
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 {
  SQLiteDatabase db;
  Button btnsave,btnDelete,btnModify,btnView,btnViewAll;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     btnsave=(Button)findViewById(R.id.btnsave);
     btnDelete=(Button) findViewById(R.id.btnDelete) ;
     btnModify=(Button) findViewById(R.id.btnModify) ;
     btnView=(Button) findViewById(R.id.btnView) ;
     EditText edttxtrollno = (EditText) findViewById(R.id.edttxtrollno);
     EditText edttxtname = (EditText) findViewById(R.id.edttxtname);
     EditText edttxtage = (EditText) findViewById(R.id.edttxtage);
     db=openOrCreateDatabase("StudentDB", Context.MODE_PRIVATE,null);
     btnsave.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
           //Toast.makeText(getApplicationContext(),"Database Created",Toast.LENGTH_LONG).show();
           db.execSQL("CREATE TABLE IF NOT EXISTS Studentnew(Rollno VARCHAR, Name VARCHAR,Age
VARCHAR);");
           //db.execSQL("INSERT INTO Student1 VALUES( '"+edttxtname.getText()+"','"+
edttxtage.getText()+"');");     db.execSQL("INSERT INTO Studentnew VALUES( '" + edttxtrollno.getText()+"',
'"+edttxtname.getText()+"','"+ edttxtage.getText()+"');");
           showToast("Record Inserted");
           edttxtrollno.setText("");
           edttxtname.setText("");
           edttxtage.setText("");
        }});
btnDelete.setOnClickListener(new View.OnClickListener() {
```

```
        @Override
        public void onClick(View view) {
db.execSQL("Delete from Studentnew where Rollno='"+ edttxtrollno.getText()+"'");
            showToast("Record Deleted");
            edttxtrollno.setText("");
            edttxtname.setText("");
            edttxtage.setText("");
        }
    });
    btnView.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            if(edttxtrollno.getText().toString().trim().length()==0){
                showToast("Please enter Rollno"); }
            Cursor c=db.rawQuery("SELECT * FROM Studentnew WHERE Rollno='"+edttxtrollno.getText()+"'",
null);
            if(c.moveToFirst())
            { if(c.getCount()==0)
                {
                    showToast("No Record Found");
                } else{
                    edttxtname.setText(c.getString(1));
                    edttxtage.setText(c.getString(2));
                }  } else {
                showToast("No Record Found ");
                        } }
    });
 btnModify.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {

            if(edttxtrollno.getText().toString().trim().length()==0)
            {
                showToast("Please enter Rollno");
            }
            Cursor c=db.rawQuery("SELECT * FROM Studentnew WHERE Rollno='"+edttxtrollno.getText()+"'",
null);
```

```
            if(c.moveToFirst(){
                db.execSQL("UPDATE Studentnew SET
Name='"+edttxtname.getText()+"',Age='"+edttxtage.getText()+
                        "' WHERE Rollno='"+edttxtrollno.getText()+"'");
                showToast("Record Updated");
                edttxtrollno.setText("");
                edttxtname.setText("");
                edttxtage.setText("");
            }}
        });}
    private void showToast(String message) {
        Toast.makeText(this, message, Toast.LENGTH_SHORT).show();
    }}
```

13.CURD:

activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/edttxtname"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Name"
        android:layout_marginBottom="16dp"/>

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

```
        android:hint="Age"
        android:layout_below="@id/edttxtname"
        android:layout_marginBottom="16dp"/>

    <Button
        android:id="@+id/btnsave"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Save"
        android:layout_below="@id/edttxtage"
        android:layout_marginBottom="16dp"/>

    <Button
        android:id="@+id/btnupdate"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Update"
        android:layout_below="@id/btnsave"
        android:layout_marginBottom="16dp"/>

    <Button
        android:id="@+id/btndelete"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Delete"
        android:layout_below="@id/btnupdate"
        android:layout_marginBottom="16dp"/>

    <Button
        android:id="@+id/btnread"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Read"
        android:layout_below="@id/btndelete"
        android:layout_marginBottom="16dp"/>

</RelativeLayout>
```

MainActivity.java:

```
package com.example.curd;

import android.annotation.SuppressLint;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

  SQLiteDatabase db;
  Button btnsave, btnupdate, btndelete, btnread;
  EditText edttxtname, edttxtage;

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

     btnsave = findViewById(R.id.btnsave);
     btnupdate = findViewById(R.id.btnupdate);
     btndelete = findViewById(R.id.btndelete);
     btnread = findViewById(R.id.btnread);
     edttxtname = findViewById(R.id.edttxtname);
     edttxtage = findViewById(R.id.edttxtage);

     db = openOrCreateDatabase("StudentDB", Context.MODE_PRIVATE, null);
     db.execSQL("CREATE TABLE IF NOT EXISTS Student1(Name VARCHAR,Age VARCHAR);");
```

```
    btnsave.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            insertRecord();
        }
    });

    btnupdate.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            updateRecord();
        }
    });

    btndelete.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            deleteRecord();
        }
    });

    btnread.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            readRecords();
        }
    });
}

private void insertRecord() {
    db.execSQL("INSERT INTO Student1 VALUES('"+edttxtname.getText()+"','"+ edttxtage.getText()+"');");
    Toast.makeText(getApplicationContext(),"Record Inserted",Toast.LENGTH_LONG).show();
}

private void updateRecord() {
```

```
        db.execSQL("UPDATE Student1 SET Age='"+edttxtage.getText()+"' WHERE
Name='"+edttxtname.getText()+"';");
        Toast.makeText(getApplicationContext(),"Record Updated",Toast.LENGTH_LONG).show();
    }

    private void deleteRecord() {
        db.execSQL("DELETE FROM Student1 WHERE Name='"+edttxtname.getText()+"';");
        Toast.makeText(getApplicationContext(),"Record Deleted",Toast.LENGTH_LONG).show();
    }

    private void readRecords() {
        Cursor cursor = db.rawQuery("SELECT * FROM Student1", null);
        StringBuilder stringBuilder = new StringBuilder();
        if (cursor.moveToFirst()) {
            do {
                String name = cursor.getString(0);
                String age = cursor.getString(1);
                stringBuilder.append("Name: ").append(name).append(", Age: ").append(age).append("\n");
            } while (cursor.moveToNext());
        }
        cursor.close();
        Toast.makeText(getApplicationContext(), stringBuilder.toString(), Toast.LENGTH_LONG).show();
    }
}
```