1. **Write an application to create a splash screen.**

```
import android.content.Intent;
import android.os.Bundle;
import android.os.Handler;
import androidx.appcompat.app.AppCompatActivity;

public class SplashActivity extends AppCompatActivity {

    // Set the splash screen display time in milliseconds (3 seconds in this case)
    private static final int SPLASH_TIME_OUT = 3000;

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

        // Using a Handler to delay the transition to the main activity
        new Handler().postDelayed(new Runnable() {
            @Override
            public void run() {
                // Start the MainActivity after the delay
                Intent intent = new Intent(SplashActivity.this, MainActivity.class);
                startActivity(intent);
                finish();  // Finish the SplashActivity so it can't be returned to
            }
        }, SPLASH_TIME_OUT);
    }
}
```

2. **Create table Student (roll no, name, address, percentage). Create Application for performing the following operation on the table. (Using SQLite database). i] Insert record of 5 new student details. ii] Show all the student details.**

DBHelper.java

```
import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
```

```
import java.util.ArrayList;

public class DBHelper extends SQLiteOpenHelper {

    // Database name and version
    private static final String DATABASE_NAME = "StudentDB";
    private static final int DATABASE_VERSION = 1;

    // Table name and columns
    private static final String TABLE_NAME = "Student";
    private static final String COLUMN_ROLL_NO = "roll_no";
    private static final String COLUMN_NAME = "name";
    private static final String COLUMN_ADDRESS = "address";
    private static final String COLUMN_PERCENTAGE = "percentage";

    // SQL to create the table
    private static final String CREATE_TABLE = "CREATE TABLE " + TABLE_NAME
+ "("
            + COLUMN_ROLL_NO + " INTEGER PRIMARY KEY, "
            + COLUMN_NAME + " TEXT, "
            + COLUMN_ADDRESS + " TEXT, "
            + COLUMN_PERCENTAGE + " REAL);";

    // Constructor
    public DBHelper(Context context) {
        super(context, DATABASE_NAME, null, DATABASE_VERSION);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        // Create the table when the database is first created
        db.execSQL(CREATE_TABLE);
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
        // Drop the old table if it exists and create a new one
        db.execSQL("DROP TABLE IF EXISTS " + TABLE_NAME);
        onCreate(db);
```

```
    }

    // Insert a new student record into the database
    public void insertStudent(int rollNo, String name, String address, double percentage) {
        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues values = new ContentValues();
        values.put(COLUMN_ROLL_NO, rollNo);
        values.put(COLUMN_NAME, name);
        values.put(COLUMN_ADDRESS, address);
        values.put(COLUMN_PERCENTAGE, percentage);

        db.insert(TABLE_NAME, null, values);
        db.close();
    }

    // Get all student details from the database
    public ArrayList<Student> getAllStudents() {
        ArrayList<Student> students = new ArrayList<>();
        SQLiteDatabase db = this.getReadableDatabase();

        // Query all rows
        Cursor cursor = db.rawQuery("SELECT * FROM " + TABLE_NAME, null);

        // Loop through the results
        if (cursor.moveToFirst()) {
            do {
                int rollNo = cursor.getInt(cursor.getColumnIndex(COLUMN_ROLL_NO));
                String name = cursor.getString(cursor.getColumnIndex(COLUMN_NAME));
                String address =
cursor.getString(cursor.getColumnIndex(COLUMN_ADDRESS));
                double percentage =
cursor.getDouble(cursor.getColumnIndex(COLUMN_PERCENTAGE));

                students.add(new Student(rollNo, name, address, percentage));
            } while (cursor.moveToNext());
        }

        cursor.close();
        db.close();
```

```
        return students;
    }
}
```

Student.java

```
public class Student {
    private int rollNo;
    private String name;
    private String address;
    private double percentage;

    public Student(int rollNo, String name, String address, double percentage) {
        this.rollNo = rollNo;
        this.name = name;
        this.address = address;
        this.percentage = percentage;
    }

    public int getRollNo() {
        return rollNo;
    }

    public String getName() {
        return name;
    }

    public String getAddress() {
        return address;
    }

    public double getPercentage() {
        return percentage;
    }
}
```

MainActivity.java

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

```
import android.widget.ListView;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {

    private DBHelper dbHelper;
    private StudentAdapter studentAdapter;
    private ListView listView;
    private Button insertButton;

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

        dbHelper = new DBHelper(this);
        listView = findViewById(R.id.listView);
        insertButton = findViewById(R.id.insertButton);

        // Insert records of 5 students
        insertButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Insert 5 student records
                dbHelper.insertStudent(1, "John Doe", "1234 Elm Street", 85.5);
                dbHelper.insertStudent(2, "Jane Smith", "5678 Oak Street", 90.0);
                dbHelper.insertStudent(3, "Sam Brown", "1234 Pine Street", 78.3);
                dbHelper.insertStudent(4, "Lucy Green", "9101 Maple Avenue", 92.5);
                dbHelper.insertStudent(5, "Mark White", "1234 Cedar Drive", 88.0);

                Toast.makeText(MainActivity.this, "Inserted 5 Students",
Toast.LENGTH_SHORT).show();

                // Refresh the list view after insertion
                loadStudentData();
            }
```

```
        });

        // Load and display all students
        loadStudentData();
    }

    // Load student data and display it in a ListView
    private void loadStudentData() {
        ArrayList<Student> students = dbHelper.getAllStudents();
        studentAdapter = new StudentAdapter(this, students);
        listView.setAdapter(studentAdapter);
    }
}
```

StudentAdapter.java

```
package com.example.studentapp;

import android.content.Context;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.ArrayAdapter;
import android.widget.TextView;

import java.util.ArrayList;

public class StudentAdapter extends ArrayAdapter<Student> {

    private Context context;
    private ArrayList<Student> students;

    public StudentAdapter(Context context, ArrayList<Student> students) {
        super(context, 0, students);
        this.context = context;
        this.students = students;
    }

    @Override
    public View getView(int position, View convertView, ViewGroup parent) {
        if (convertView == null) {
```

```
            convertView = LayoutInflater.from(context).inflate(R.layout.student_item, parent,
false);
        }

        // Get the current student item
        Student student = students.get(position);

        // Set the student details in the ListView item
        TextView rollNoText = convertView.findViewById(R.id.rollNoText);
        TextView nameText = convertView.findViewById(R.id.nameText);
        TextView addressText = convertView.findViewById(R.id.addressText);
        TextView percentageText = convertView.findViewById(R.id.percentageText);

        rollNoText.setText(String.valueOf(student.getRollNo()));
        nameText.setText(student.getName());
        addressText.setText(student.getAddress());
        percentageText.setText(String.valueOf(student.getPercentage()) + "%");

        return convertView;
    }
}
```

activity_main.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:orientation="vertical">

    <Button
        android:id="@+id/insertButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Insert 5 Students" />

    <ListView
        android:id="@+id/listView"
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1" />
```

```
</LinearLayout>
```

3. **Create an application that allows the user to enter a number in the textbox. Check whether the number in the textbox is Prime or not. Print the message accordingly in the label control.**

activity_main.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:orientation="vertical"
    android:padding="16dp"
    android:gravity="center">

    <!-- Input field to enter a number -->
    <EditText
        android:id="@+id/numberEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter a number"
        android:inputType="number" />

    <!-- Button to check if the number is prime -->
    <Button
        android:id="@+id/checkButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Check Prime"
        android:layout_marginTop="20dp"/>

    <!-- Label to display the result -->
    <TextView
        android:id="@+id/resultTextView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=""
        android:textSize="18sp"
        android:layout_marginTop="20dp" />
</LinearLayout>
```

MainActivity.java

```
package com.example.primecheckapp;

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 androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText numberEditText;
    private Button checkButton;
    private TextView resultTextView;

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

        // Initialize UI elements
        numberEditText = findViewById(R.id.numberEditText);
        checkButton = findViewById(R.id.checkButton);
        resultTextView = findViewById(R.id.resultTextView);

        // Set the button click listener
        checkButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Get the number entered by the user
                String input = numberEditText.getText().toString();

                // Validate input
                if (input.isEmpty()) {
                    Toast.makeText(MainActivity.this, "Please enter a number",
Toast.LENGTH_SHORT).show();
                    return;
```

```
            }

            // Convert the input to an integer
            int number = Integer.parseInt(input);

            // Check if the number is prime and display the result
            if (isPrime(number)) {
                resultTextView.setText(number + " is a Prime number.");
            } else {
                resultTextView.setText(number + " is not a Prime number.");
            }
        }
    });
  }

  // Function to check if a number is prime
  private boolean isPrime(int number) {
    if (number <= 1) {
        return false; // Numbers less than or equal to 1 are not prime
    }

    // Check divisibility from 2 to the square root of the number
    for (int i = 2; i <= Math.sqrt(number); i++) {
        if (number % i == 0) {
            return false; // Number is divisible by i, so it's not prime
        }
    }

    return true; // Number is prime
  }
}
```

4. **Construct image switcher using setFactory().**

Activity_main.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:orientation="vertical"
    android:gravity="center"
    android:padding="16dp">

    <!-- ImageSwitcher to display images -->
    <ImageSwitcher
        android:id="@+id/imageSwitcher"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:inAnimation="@android:anim/slide_in_left"
        android:outAnimation="@android:anim/slide_out_right" />

    <!-- Button to switch images -->
    <Button
        android:id="@+id/nextImageButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Next Image"
        android:layout_marginTop="20dp" />
</LinearLayout>
```

MainActivity.java

```
package com.example.imageswitcherapp;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.ImageSwitcher;
import android.widget.ImageView;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    // Define the ImageSwitcher and button
    private ImageSwitcher imageSwitcher;
    private Button nextImageButton;

    // Array of images to be displayed in the ImageSwitcher
```

```
    private int[] imageIds = {R.drawable.image1, R.drawable.image2,
R.drawable.image3};
    private int currentIndex = 0; // To track the current image being displayed

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

        // Initialize ImageSwitcher and Button
        imageSwitcher = findViewById(R.id.imageSwitcher);
        nextImageButton = findViewById(R.id.nextImageButton);

        // Set the ImageSwitcher Factory
        imageSwitcher.setFactory(() -> {
            ImageView imageView = new ImageView(MainActivity.this);
            imageView.setScaleType(ImageView.ScaleType.CENTER_CROP);
            return imageView;
        });

        // Set the first image
        imageSwitcher.setImageResource(imageIds[currentIndex]);

        // Set an onClickListener for the button to switch images
        nextImageButton.setOnClickListener(v -> {
            // Increment the index to get the next image
            currentIndex = (currentIndex + 1) % imageIds.length; // Wrap around when it
reaches the end

            // Set the next image
            imageSwitcher.setImageResource(imageIds[currentIndex]);

            // Optionally, display a toast with the index of the current image
            Toast.makeText(MainActivity.this, "Image " + (currentIndex + 1),
Toast.LENGTH_SHORT).show();
        });
    }
}
```

5. **Create a Application which shows Life Cycle of Activity.**

```
package com.example.activitylifecycle;

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

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private static final String TAG = "ActivityLifeCycle";
    private TextView lifeCycleTextView;
    private Button lifeCycleButton;

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

        lifeCycleTextView = findViewById(R.id.lifeCycleTextView);
        lifeCycleButton = findViewById(R.id.lifeCycleButton);

        // Log and display the onCreate message
        Log.d(TAG, "onCreate() called");
        lifeCycleTextView.setText("onCreate() called");

        // Optional button functionality to show user interaction
        lifeCycleButton.setOnClickListener(v -> {
            Log.d(TAG, "Button clicked during onCreate()");
            lifeCycleTextView.setText("Button clicked during onCreate()");
        });
    }

    @Override
    protected void onStart() {
        super.onStart();
        // Log and display the onStart message
```

```
    Log.d(TAG, "onStart() called");
    lifeCycleTextView.setText("onStart() called");
}

@Override
protected void onResume() {
    super.onResume();
    // Log and display the onResume message
    Log.d(TAG, "onResume() called");
    lifeCycleTextView.setText("onResume() called");
}

@Override
protected void onPause() {
    super.onPause();
    // Log and display the onPause message
    Log.d(TAG, "onPause() called");
    lifeCycleTextView.setText("onPause() called");
}

@Override
protected void onStop() {
    super.onStop();
    // Log and display the onStop message
    Log.d(TAG, "onStop() called");
    lifeCycleTextView.setText("onStop() called");
}

@Override
protected void onRestart() {
    super.onRestart();
    // Log and display the onRestart message
    Log.d(TAG, "onRestart() called");
    lifeCycleTextView.setText("onRestart() called");
}

@Override
protected void onDestroy() {
    super.onDestroy();
    // Log and display the onDestroy message
```

```
        Log.d(TAG, "onDestroy() called");
        lifeCycleTextView.setText("onDestroy() called");
    }
}
```

6. **Create an Android Application to accept two numbers to calculate it's Power and Average. Create two buttons: Power and Average. Display the appropriate result on the next activity on Button click.**

Activity_main.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:orientation="vertical"
    android:gravity="center"
    android:padding="16dp">

    <!-- EditText for first number -->
    <EditText
        android:id="@+id/firstNumber"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter First Number"
        android:inputType="numberDecimal"/>

    <!-- EditText for second number -->
    <EditText
        android:id="@+id/secondNumber"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Second Number"
        android:inputType="numberDecimal"
        android:layout_marginTop="16dp"/>

    <!-- Button to calculate Power -->
    <Button
        android:id="@+id/powerButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
            android:text="Calculate Power"
            android:layout_marginTop="20dp"/>

        <!-- Button to calculate Average -->
        <Button
            android:id="@+id/averageButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Calculate Average"
            android:layout_marginTop="20dp"/>
    </LinearLayout>
```

activity_result.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:orientation="vertical"
        android:gravity="center"
        android:padding="16dp">

        <!-- TextView to display the result -->
        <TextView
            android:id="@+id/resultTextView"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:textSize="18sp"
            android:text="Result will be shown here"
            android:layout_marginTop="20dp"/>

        <!-- Button to go back to MainActivity -->
        <Button
            android:id="@+id/backButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Back to Main"
            android:layout_marginTop="20dp"/>
    </LinearLayout>
```

MainActivity.java

```
package com.example.powerandaveragecalculator;

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

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText firstNumberEditText, secondNumberEditText;
    private Button powerButton, averageButton;

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

        // Initialize views
        firstNumberEditText = findViewById(R.id.firstNumber);
        secondNumberEditText = findViewById(R.id.secondNumber);
        powerButton = findViewById(R.id.powerButton);
        averageButton = findViewById(R.id.averageButton);

        // Set onClickListener for Power Button
        powerButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Get values from EditTexts
                double firstNumber =
Double.parseDouble(firstNumberEditText.getText().toString());
                double secondNumber =
Double.parseDouble(secondNumberEditText.getText().toString());

                // Calculate power (firstNumber ^ secondNumber)
                double result = Math.pow(firstNumber, secondNumber);

                // Pass result to ResultActivity
```

```
            Intent intent = new Intent(MainActivity.this, ResultActivity.class);
            intent.putExtra("result", result);
            intent.putExtra("operation", "Power");
            startActivity(intent);
        }
    });

    // Set onClickListener for Average Button
    averageButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            // Get values from EditTexts
            double firstNumber =
Double.parseDouble(firstNumberEditText.getText().toString());
            double secondNumber =
Double.parseDouble(secondNumberEditText.getText().toString());

            // Calculate average
            double result = (firstNumber + secondNumber) / 2;

            // Pass result to ResultActivity
            Intent intent = new Intent(MainActivity.this, ResultActivity.class);
            intent.putExtra("result", result);
            intent.putExtra("operation", "Average");
            startActivity(intent);
        }
    });
  }
}
```

ResultActivity.java

```
package com.example.powerandaveragecalculator;

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

import androidx.appcompat.app.AppCompatActivity;
```

```
public class ResultActivity extends AppCompatActivity {

    private TextView resultTextView;
    private Button backButton;

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

        // Initialize views
        resultTextView = findViewById(R.id.resultTextView);
        backButton = findViewById(R.id.backButton);

        // Get the result and operation type from the Intent
        double result = getIntent().getDoubleExtra("result", 0);
        String operation = getIntent().getStringExtra("operation");

        // Set the result text based on the operation
        resultTextView.setText(operation + " Result: " + result);

        // Set OnClickListener to go back to MainActivity
        backButton.setOnClickListener(v -> finish());
    }
}
```

7. Construct an Android application to accept a number and calculate Armstrong and Perfect number of a given number.

activity_main.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:orientation="vertical"
    android:gravity="center"
    android:padding="16dp">
```

```
    <!-- EditText for entering the number -->
    <EditText
        android:id="@+id/numberEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Number"
        android:inputType="numberDecimal"/>

    <!-- Button to check Armstrong number -->
    <Button
        android:id="@+id/armstrongButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Check Armstrong Number"
        android:layout_marginTop="20dp"/>

    <!-- Button to check Perfect number -->
    <Button
        android:id="@+id/perfectButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Check Perfect Number"
        android:layout_marginTop="20dp"/>

    <!-- TextView to display the result -->
    <TextView
        android:id="@+id/resultTextView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Result will appear here"
        android:textSize="18sp"
        android:layout_marginTop="30dp"/>
</LinearLayout>
```

MainActivity.java

```
package com.example.armstrongperfectnumber;

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

```
import android.widget.EditText;
import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText numberEditText;
    private Button armstrongButton, perfectButton;
    private TextView resultTextView;

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

        // Initialize views
        numberEditText = findViewById(R.id.numberEditText);
        armstrongButton = findViewById(R.id.armstrongButton);
        perfectButton = findViewById(R.id.perfectButton);
        resultTextView = findViewById(R.id.resultTextView);

        // Set click listener for Armstrong number check
        armstrongButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String numberStr = numberEditText.getText().toString();
                if (numberStr.isEmpty()) {
                    resultTextView.setText("Please enter a number.");
                    return;
                }

                int number = Integer.parseInt(numberStr);
                if (isArmstrongNumber(number)) {
                    resultTextView.setText(number + " is an Armstrong number.");
                } else {
                    resultTextView.setText(number + " is not an Armstrong number.");
                }
            }
        });
```

```
    // Set click listener for Perfect number check
    perfectButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            String numberStr = numberEditText.getText().toString();
            if (numberStr.isEmpty()) {
                resultTextView.setText("Please enter a number.");
                return;
            }

            int number = Integer.parseInt(numberStr);
            if (isPerfectNumber(number)) {
                resultTextView.setText(number + " is a Perfect number.");
            } else {
                resultTextView.setText(number + " is not a Perfect number.");
            }
        }
    });
}

// Method to check if a number is Armstrong
private boolean isArmstrongNumber(int number) {
    int sum = 0, temp, remainder;
    int digits = String.valueOf(number).length();
    temp = number;

    while (temp != 0) {
        remainder = temp % 10;
        sum += Math.pow(remainder, digits);
        temp /= 10;
    }

    return sum == number;
}

// Method to check if a number is Perfect
private boolean isPerfectNumber(int number) {
    int sum = 0;
    for (int i = 1; i <= number / 2; i++) {
```

```
            if (number % i == 0) {
                sum += i;
            }
        }
        return sum == number;
    }
}
```

8. **Write a Java Android Program to Demonstrate List View Activity with all operations Such as: Insert, Delete, Search**

activity_main.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:orientation="vertical"
    android:padding="16dp"
    android:gravity="center">

    <!-- EditText to input item -->
    <EditText
        android:id="@+id/itemEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Item"
        android:inputType="text"/>

    <!-- Button to insert item into the list -->
    <Button
        android:id="@+id/insertButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Insert"
        android:layout_marginTop="10dp"/>

    <!-- Button to delete item from the list -->
    <Button
        android:id="@+id/deleteButton"
```

```
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Delete"
            android:layout_marginTop="10dp"/>

        <!-- Button to search item in the list -->
        <Button
            android:id="@+id/searchButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Search"
            android:layout_marginTop="10dp"/>

        <!-- ListView to display the list of items -->
        <ListView
            android:id="@+id/itemListView"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="20dp"/>
    </LinearLayout>
```

MainActivity.java

```
    package com.example.listviewoperations;

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

    import androidx.appcompat.app.AppCompatActivity;

    import java.util.ArrayList;

    public class MainActivity extends AppCompatActivity {

        private EditText itemEditText;
        private Button insertButton, deleteButton, searchButton;
```

```
    private ListView itemListView;

    private ArrayList<String> itemList;
    private ArrayAdapter<String> adapter;

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

        // Initialize views
        itemEditText = findViewById(R.id.itemEditText);
        insertButton = findViewById(R.id.insertButton);
        deleteButton = findViewById(R.id.deleteButton);
        searchButton = findViewById(R.id.searchButton);
        itemListView = findViewById(R.id.itemListView);

        // Initialize the list and adapter
        itemList = new ArrayList<>();
        adapter = new ArrayAdapter<>(this, android.R.layout.simple_list_item_1, itemList);
        itemListView.setAdapter(adapter);

        // Insert item
        insertButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String item = itemEditText.getText().toString().trim();
                if (!item.isEmpty()) {
                    itemList.add(item);
                    adapter.notifyDataSetChanged();
                    itemEditText.setText(""); // Clear the input field
                    Toast.makeText(MainActivity.this, "Item inserted",
Toast.LENGTH_SHORT).show();
                } else {
                    Toast.makeText(MainActivity.this, "Please enter an item",
Toast.LENGTH_SHORT).show();
                }
            }
        });
```

```
        // Delete item
        deleteButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String item = itemEditText.getText().toString().trim();
                if (!item.isEmpty()) {
                    if (itemList.contains(item)) {
                        itemList.remove(item);
                        adapter.notifyDataSetChanged();
                        itemEditText.setText(""); // Clear the input field
                        Toast.makeText(MainActivity.this, "Item deleted",
Toast.LENGTH_SHORT).show();
                    } else {
                        Toast.makeText(MainActivity.this, "Item not found",
Toast.LENGTH_SHORT).show();
                    }
                } else {
                    Toast.makeText(MainActivity.this, "Please enter an item",
Toast.LENGTH_SHORT).show();
                }
            }
        });

        // Search item
        searchButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String item = itemEditText.getText().toString().trim();
                if (!item.isEmpty()) {
                    if (itemList.contains(item)) {
                        Toast.makeText(MainActivity.this, "Item found: " + item,
Toast.LENGTH_SHORT).show();
                    } else {
                        Toast.makeText(MainActivity.this, "Item not found",
Toast.LENGTH_SHORT).show();
                    }
                } else {
                    Toast.makeText(MainActivity.this, "Please enter an item",
Toast.LENGTH_SHORT).show();
                }
```

```
            }
        });
    }
}
```

9. Create an application to change Font Size, Color and Font Family of String.

activity_main.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:orientation="vertical"
    android:padding="16dp"
    android:gravity="center">

    <!-- EditText to input the string -->
    <EditText
        android:id="@+id/inputText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter text here"
        android:textSize="18sp"/>

    <!-- TextView to display the string with the selected font settings -->
    <TextView
        android:id="@+id/displayText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="This is sample text"
        android:textSize="18sp"
        android:layout_marginTop="20dp"
        android:gravity="center"/>

    <!-- SeekBar to adjust font size -->
    <SeekBar
        android:id="@+id/fontSizeSeekBar"
        android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content"
        android:max="100"
        android:progress="18"
        android:layout_marginTop="20dp"/>

    <!-- Spinner to select font family -->
    <Spinner
        android:id="@+id/fontFamilySpinner"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"/>

    <!-- Button to pick font color -->
    <Button
        android:id="@+id/colorButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Pick Color"
        android:layout_marginTop="20dp"/>

</LinearLayout>
```

MainActivity.java

```
package com.example.fontchanger;

import android.graphics.Color;
import android.os.Bundle;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.EditText;
import android.widget.SeekBar;
import android.widget.Spinner;
import android.widget.TextView;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

import com.google.android.material.colorpicker.ColorPickerDialog;
import com.google.android.material.colorpicker.OnColorSelectedListener;
```

```
public class MainActivity extends AppCompatActivity {

    private EditText inputText;
    private TextView displayText;
    private SeekBar fontSizeSeekBar;
    private Spinner fontFamilySpinner;
    private Button colorButton;

    private String[] fontFamilies = {"Default", "Serif", "Monospace", "sans-serif",
"sans-serif-light"};

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

        // Initialize views
        inputText = findViewById(R.id.inputText);
        displayText = findViewById(R.id.displayText);
        fontSizeSeekBar = findViewById(R.id.fontSizeSeekBar);
        fontFamilySpinner = findViewById(R.id.fontFamilySpinner);
        colorButton = findViewById(R.id.colorButton);

        // Set up the font family spinner
        ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
android.R.layout.simple_spinner_item, fontFamilies);

adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
        fontFamilySpinner.setAdapter(adapter);

        // Set the initial font size from the SeekBar
        int initialFontSize = fontSizeSeekBar.getProgress();
        displayText.setTextSize(initialFontSize);

        // Font size adjustment using SeekBar
        fontSizeSeekBar.setOnSeekBarChangeListener(new
SeekBar.OnSeekBarChangeListener() {
            @Override
```

```
        public void onProgressChanged(SeekBar seekBar, int progress, boolean
fromUser) {
            displayText.setTextSize(progress);
        }

        @Override
        public void onStartTrackingTouch(SeekBar seekBar) {}

        @Override
        public void onStopTrackingTouch(SeekBar seekBar) {}
    });

    // Change font family based on the selection in Spinner
    fontFamilySpinner.setOnItemSelectedListener((parentView, selectedItemView,
position, id) -> {
        String selectedFont = fontFamilies[position];
        switch (selectedFont) {
            case "Serif":
                displayText.setTypeface(android.graphics.Typeface.SERIF);
                break;
            case "Monospace":
                displayText.setTypeface(android.graphics.Typeface.MONOSPACE);
                break;
            case "sans-serif":
                displayText.setTypeface(android.graphics.Typeface.SANS_SERIF);
                break;
            case "sans-serif-light":
                displayText.setTypeface(android.graphics.Typeface.create("sans-serif-light",
android.graphics.Typeface.NORMAL));
                break;
            default:
                displayText.setTypeface(android.graphics.Typeface.DEFAULT);
                break;
        }
    });

    // Open color picker when button is clicked
    colorButton.setOnClickListener(v -> {
        ColorPickerDialog.newBuilder()
            .setDialogId(0)
```

```
            .setAllowCustom(true)
            .setShowAlphaSlider(true)
            .setColor(Color.BLACK)
            .setPresets(new int[] {Color.BLACK, Color.RED, Color.GREEN,
Color.BLUE})
            .setCallback(new OnColorSelectedListener() {
               @Override
               public void onColorSelected(int color) {
                  displayText.setTextColor(color);
               }
            })
            .build()
            .show(MainActivity.this);
      });
   }
}
```

10. Create an application to change Font Size, Color and Font Family of String.

Activity_main.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   android:padding="16dp">

   <TextView
      android:id="@+id/sampleText"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Hello, customize my font!"
      android:textSize="20sp"
      android:textColor="#000000"
      android:layout_gravity="center"/>

   <SeekBar
      android:id="@+id/fontSizeSeekBar"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:max="40"
```

```
        android:progress="20"/>

    <Spinner
        android:id="@+id/fontColorSpinner"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:entries="@array/font_colors"/>

    <Spinner
        android:id="@+id/fontFamilySpinner"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:entries="@array/font_families"/>

</LinearLayout>
```

strings.xml

```
<string-array name="font_colors">
    <item>Black</item>
    <item>Red</item>
    <item>Blue</item>
    <item>Green</item>
</string-array>

<string-array name="font_families">
    <item>Sans</item>
    <item>Serif</item>
    <item>Monospace</item>
</string-array>
```

MainActivity.java

```
package com.example.fontcustomizer;

import android.graphics.Color;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.SeekBar;
import android.widget.Spinner;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;
```

```
public class MainActivity extends AppCompatActivity {

    private TextView sampleText;
    private SeekBar fontSizeSeekBar;
    private Spinner fontColorSpinner;
    private Spinner fontFamilySpinner;

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

        sampleText = findViewById(R.id.sampleText);
        fontSizeSeekBar = findViewById(R.id.fontSizeSeekBar);
        fontColorSpinner = findViewById(R.id.fontColorSpinner);
        fontFamilySpinner = findViewById(R.id.fontFamilySpinner);

        fontSizeSeekBar.setOnSeekBarChangeListener(new
SeekBar.OnSeekBarChangeListener() {
            @Override
            public void onProgressChanged(SeekBar seekBar, int progress, boolean
fromUser) {
                sampleText.setTextSize(progress);
            }

            @Override
            public void onStartTrackingTouch(SeekBar seekBar) {}

            @Override
            public void onStopTrackingTouch(SeekBar seekBar) {}
        });

        fontColorSpinner.setOnItemSelectedListener(new
AdapterView.OnItemSelectedListener() {
            @Override
            public void onItemSelected(AdapterView<?> parent, View view, int position,
long id) {
                switch (position) {
                    case 0:
```

```
                sampleText.setTextColor(Color.BLACK);
                break;
            case 1:
                sampleText.setTextColor(Color.RED);
                break;
            case 2:
                sampleText.setTextColor(Color.BLUE);
                break;
            case 3:
                sampleText.setTextColor(Color.GREEN);
                break;
        }
    }

    @Override
    public void onNothingSelected(AdapterView<?> parent) {}
});

fontFamilySpinner.setOnItemSelectedListener(new
AdapterView.OnItemSelectedListener() {
    @Override
    public void onItemSelected(AdapterView<?> parent, View view, int position,
long id) {
        switch (position) {
            case 0:
                sampleText.setTypeface(Typeface.SANS_SERIF);
                break;
            case 1:
                sampleText.setTypeface(Typeface.SERIF);
                break;
            case 2:
                sampleText.setTypeface(Typeface.MONOSPACE);
                break;
        }
    }

    @Override
    public void onNothingSelected(AdapterView<?> parent) {}
});
}
```

```
}
```

11. Create an application for registration form given below. Also perform appropriate validation.

```
<ScrollView xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical">

        <EditText
            android:id="@+id/etUsername"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Username"
            android:inputType="textPersonName" />

        <EditText
            android:id="@+id/etEmail"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Email"
            android:inputType="textEmailAddress" />

        <EditText
            android:id="@+id/etPassword"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Password"
            android:inputType="textPassword" />

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

```
            android:hint="Confirm Password"
            android:inputType="textPassword" />

        <EditText
            android:id="@+id/etPhone"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Phone Number"
            android:inputType="phone" />

        <Button
            android:id="@+id/btnRegister"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Register"
            android:layout_marginTop="16dp"/>

    </LinearLayout>
</ScrollView>
```

MainActivity.java

```
package com.example.registrationapp;

import android.os.Bundle;
import android.text.TextUtils;
import android.util.Patterns;
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 {

    private EditText etUsername, etEmail, etPassword, etConfirmPassword, etPhone;
    private Button btnRegister;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
```

```
        setContentView(R.layout.activity_registration);

        etUsername = findViewById(R.id.etUsername);
        etEmail = findViewById(R.id.etEmail);
        etPassword = findViewById(R.id.etPassword);
        etConfirmPassword = findViewById(R.id.etConfirmPassword);
        etPhone = findViewById(R.id.etPhone);
        btnRegister = findViewById(R.id.btnRegister);

        btnRegister.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                if (validateInputs()) {
                    Toast.makeText(MainActivity.this, "Registration Successful",
Toast.LENGTH_SHORT).show();
                }
            }
        });
    }

    private boolean validateInputs() {
        // Username Validation
        if (TextUtils.isEmpty(etUsername.getText())) {
            etUsername.setError("Username is required");
            etUsername.requestFocus();
            return false;
        }

        // Email Validation
        if (TextUtils.isEmpty(etEmail.getText()) ||
!Patterns.EMAIL_ADDRESS.matcher(etEmail.getText()).matches()) {
            etEmail.setError("Valid email is required");
            etEmail.requestFocus();
            return false;
        }

        // Password Validation
        if (TextUtils.isEmpty(etPassword.getText()) || etPassword.getText().length() < 6) {
            etPassword.setError("Password must be at least 6 characters");
            etPassword.requestFocus();
```

```
            return false;
        }

        // Confirm Password Validation
        if (!etPassword.getText().toString().equals(etConfirmPassword.getText().toString()))
{
            etConfirmPassword.setError("Passwords do not match");
            etConfirmPassword.requestFocus();
            return false;
        }

        // Phone Number Validation
        if (TextUtils.isEmpty(etPhone.getText()) ||
!Patterns.PHONE.matcher(etPhone.getText()).matches()) {
            etPhone.setError("Valid phone number is required");
            etPhone.requestFocus();
            return false;
        }

        return true;
    }
}
```

12. Construct a bank app to display different menu like withdraw, deposit etc.

Activity_main.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:gravity="center"
    android:padding="16dp">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Welcome to Your Bank App"
        android:textSize="24sp"
        android:textStyle="bold"
        android:layout_marginBottom="24dp"/>
```

```
    <Button
        android:id="@+id/btnDeposit"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Deposit"
        android:layout_marginBottom="16dp" />

    <Button
        android:id="@+id/btnWithdraw"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Withdraw"
        android:layout_marginBottom="16dp" />

    <Button
        android:id="@+id/btnBalanceInquiry"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Balance Inquiry"
        android:layout_marginBottom="16dp" />

    <Button
        android:id="@+id/btnExit"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Exit" />

</LinearLayout>
```

MainActivity.java

```
package com.example.bankapp;

import android.content.DialogInterface;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;
import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;
```

```
public class MainActivity extends AppCompatActivity {

    private Button btnDeposit, btnWithdraw, btnBalanceInquiry, btnExit;
    private double balance = 0.0;

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

        btnDeposit = findViewById(R.id.btnDeposit);
        btnWithdraw = findViewById(R.id.btnWithdraw);
        btnBalanceInquiry = findViewById(R.id.btnBalanceInquiry);
        btnExit = findViewById(R.id.btnExit);

        btnDeposit.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                showInputDialog("Deposit");
            }
        });

        btnWithdraw.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                showInputDialog("Withdraw");
            }
        });

        btnBalanceInquiry.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Toast.makeText(MainActivity.this, "Current Balance: $" + balance,
Toast.LENGTH_SHORT).show();
            }
        });

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

```
            public void onClick(View v) {
                finish();  // Exit the app
            }
        });
    }

    private void showInputDialog(final String action) {
        AlertDialog.Builder builder = new AlertDialog.Builder(this);
        builder.setTitle(action);

        final View customLayout = getLayoutInflater().inflate(R.layout.dialog_input, null);
        builder.setView(customLayout);

        builder.setPositiveButton(action, new DialogInterface.OnClickListener() {
            @Override
            public void onClick(DialogInterface dialog, int which) {
                double amount = 0.0;
                try {
                    amount =
Double.parseDouble(customLayout.findViewById(R.id.etAmount).toString());
                } catch (NumberFormatException e) {
                    Toast.makeText(MainActivity.this, "Invalid amount",
Toast.LENGTH_SHORT).show();
                    return;
                }

                if (action.equals("Deposit")) {
                    balance += amount;
                    Toast.makeText(MainActivity.this, "Deposited: $" + amount,
Toast.LENGTH_SHORT).show();
                } else if (action.equals("Withdraw")) {
                    if (amount > balance) {
                        Toast.makeText(MainActivity.this, "Insufficient Balance",
Toast.LENGTH_SHORT).show();
                    } else {
                        balance -= amount;
                        Toast.makeText(MainActivity.this, "Withdrew: $" + amount,
Toast.LENGTH_SHORT).show();
                    }
                }
```

```
            }
        });

        builder.setNegativeButton("Cancel", null);
        builder.show();
    }
}
```

Dialog_input.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    android:padding="16dp">

    <EditText
        android:id="@+id/etAmount"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Amount"
        android:inputType="numberDecimal" />

</LinearLayout>
```

13. Create an application that demonstrate Options Menu, Context Menu and Popup Menu in android.

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    android:gravity="center">

    <Button
        android:id="@+id/btnOptionsMenu"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Show Options Menu" />
```

```
        <Button
            android:id="@+id/btnContextMenu"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Show Context Menu"
            android:layout_marginTop="16dp" />

        <Button
            android:id="@+id/btnPopupMenu"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Show Popup Menu"
            android:layout_marginTop="16dp" />

    </LinearLayout>
```

Menu_options.xml

```
<menu xmlns:android="http://schemas.android.com/apk/res/android">
    <item android:id="@+id/action_settings"
        android:title="Settings" />
    <item android:id="@+id/action_about"
        android:title="About" />
    <item android:id="@+id/action_help"
        android:title="Help" />
</menu>
```

menu_context.xml

```
<menu xmlns:android="http://schemas.android.com/apk/res/android">
    <item android:id="@+id/context_edit"
        android:title="Edit" />
    <item android:id="@+id/context_delete"
        android:title="Delete" />
    <item android:id="@+id/context_share"
        android:title="Share" />
</menu>
```

menu_popup.xml

```
<menu xmlns:android="http://schemas.android.com/apk/res/android">
    <item android:id="@+id/popup_copy"
        android:title="Copy" />
    <item android:id="@+id/popup_paste"
        android:title="Paste" />
    <item android:id="@+id/popup_cut"
        android:title="Cut" />
</menu>
```

MainActivity.java

```
package com.example.menusapp;

import android.os.Bundle;
import android.view.ContextMenu;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.PopupMenu;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private Button btnOptionsMenu, btnContextMenu, btnPopupMenu;

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

        btnOptionsMenu = findViewById(R.id.btnOptionsMenu);
        btnContextMenu = findViewById(R.id.btnContextMenu);
        btnPopupMenu = findViewById(R.id.btnPopupMenu);

        // Register Context Menu
        registerForContextMenu(btnContextMenu);
```

```
        // Set OnClickListener for Popup Menu
        btnPopupMenu.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                showPopupMenu(v);
            }
        });
    }

    // Options Menu - Inflate menu_options.xml
    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        MenuInflater inflater = getMenuInflater();
        inflater.inflate(R.menu.menu_options, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(@NonNull MenuItem item) {
        switch (item.getItemId()) {
            case R.id.action_settings:
                Toast.makeText(this, "Settings selected", Toast.LENGTH_SHORT).show();
                return true;
            case R.id.action_about:
                Toast.makeText(this, "About selected", Toast.LENGTH_SHORT).show();
                return true;
            case R.id.action_help:
                Toast.makeText(this, "Help selected", Toast.LENGTH_SHORT).show();
                return true;
            default:
                return super.onOptionsItemSelected(item);
        }
    }

    // Context Menu - Inflate menu_context.xml
    @Override
    public void onCreateContextMenu(ContextMenu menu, View v,
ContextMenu.ContextMenuInfo menuInfo) {
        super.onCreateContextMenu(menu, v, menuInfo);
```

```
    MenuInflater inflater = getMenuInflater();
    inflater.inflate(R.menu.menu_context, menu);
    menu.setHeaderTitle("Choose an action");
  }

  @Override
  public boolean onContextItemSelected(@NonNull MenuItem item) {
    switch (item.getItemId()) {
      case R.id.context_edit:
        Toast.makeText(this, "Edit selected", Toast.LENGTH_SHORT).show();
        return true;
      case R.id.context_delete:
        Toast.makeText(this, "Delete selected", Toast.LENGTH_SHORT).show();
        return true;
      case R.id.context_share:
        Toast.makeText(this, "Share selected", Toast.LENGTH_SHORT).show();
        return true;
      default:
        return super.onContextItemSelected(item);
    }
  }

  // Popup Menu - Show Popup Menu
  private void showPopupMenu(View v) {
    PopupMenu popup = new PopupMenu(this, v);
    popup.getMenuInflater().inflate(R.menu.menu_popup, popup.getMenu());

    popup.setOnMenuItemClickListener(new PopupMenu.OnMenuItemClickListener() {
      @Override
      public boolean onMenuItemClick(MenuItem item) {
        switch (item.getItemId()) {
          case R.id.popup_copy:
            Toast.makeText(MainActivity.this, "Copy selected",
Toast.LENGTH_SHORT).show();
            return true;
          case R.id.popup_paste:
            Toast.makeText(MainActivity.this, "Paste selected",
Toast.LENGTH_SHORT).show();
            return true;
          case R.id.popup_cut:
```

```
                Toast.makeText(MainActivity.this, "Cut selected",
Toast.LENGTH_SHORT).show();
                return true;
            default:
                return false;
        }
      }
    });
    popup.show();
  }
}
```

14. Create an application to accept two numbers and find power and Average. Display the result on the next activity on Button click.

activity_main.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:orientation="vertical"
  android:padding="16dp"
  android:gravity="center">

  <EditText
    android:id="@+id/etNumber1"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter First Number"
    android:inputType="numberDecimal"
    android:layout_marginBottom="8dp" />

  <EditText
    android:id="@+id/etNumber2"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter Second Number"
    android:inputType="numberDecimal"
    android:layout_marginBottom="16dp" />
```

```
    <Button
        android:id="@+id/btnCalculate"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Calculate Power and Average" />

</LinearLayout>
```

activity_result.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:gravity="center"
    android:padding="16dp">

    <TextView
        android:id="@+id/tvPower"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Power: "
        android:textSize="18sp"
        android:layout_marginBottom="8dp" />

    <TextView
        android:id="@+id/tvAverage"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Average: "
        android:textSize="18sp"
        android:layout_marginBottom="8dp" />

</LinearLayout>
```

MainActivity.java

```
package com.example.poweraverageapp;

import android.content.Intent;
import android.os.Bundle;
```

```
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText etNumber1, etNumber2;
    private Button btnCalculate;

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

        etNumber1 = findViewById(R.id.etNumber1);
        etNumber2 = findViewById(R.id.etNumber2);
        btnCalculate = findViewById(R.id.btnCalculate);

        btnCalculate.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                if (!etNumber1.getText().toString().isEmpty() &&
!etNumber2.getText().toString().isEmpty()) {
                    double number1 = Double.parseDouble(etNumber1.getText().toString());
                    double number2 = Double.parseDouble(etNumber2.getText().toString());

                    double power = Math.pow(number1, number2);
                    double average = (number1 + number2) / 2;

                    Intent intent = new Intent(MainActivity.this, ResultActivity.class);
                    intent.putExtra("POWER_RESULT", power);
                    intent.putExtra("AVERAGE_RESULT", average);
                    startActivity(intent);
                } else {
                    Toast.makeText(MainActivity.this, "Please enter both numbers",
Toast.LENGTH_SHORT).show();
                }
            }
```

```
        });
    }
}
```

ResultActivity.java

```
package com.example.poweraverageapp;

import android.os.Bundle;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class ResultActivity extends AppCompatActivity {

    private TextView tvPower, tvAverage;

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

        tvPower = findViewById(R.id.tvPower);
        tvAverage = findViewById(R.id.tvAverage);

        // Get the intent and retrieve the results
        double powerResult = getIntent().getDoubleExtra("POWER_RESULT", 0);
        double averageResult = getIntent().getDoubleExtra("AVERAGE_RESULT", 0);

        // Display the results
        tvPower.setText("Power: " + powerResult);
        tvAverage.setText("Average: " + averageResult);
    }
}
```

15. Create an application that accept multiple items from one activity and pass to next activity and display the calculation of the first and second activity data on third.

activity_first.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
```

```
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    android:gravity="center">

    <EditText
        android:id="@+id/etNumber1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter First Number"
        android:inputType="numberDecimal" />

    <EditText
        android:id="@+id/etNumber2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Second Number"
        android:inputType="numberDecimal"
        android:layout_marginTop="16dp" />

    <Button
        android:id="@+id/btnToSecondActivity"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Next" />

</LinearLayout>
```

activity_second.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    android:gravity="center">

    <EditText
        android:id="@+id/etNumber3"
        android:layout_width="match_parent"
```

```
            android:layout_height="wrap_content"
            android:hint="Enter Third Number"
            android:inputType="numberDecimal" />

        <EditText
            android:id="@+id/etNumber4"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Enter Fourth Number"
            android:inputType="numberDecimal"
            android:layout_marginTop="16dp" />

        <Button
            android:id="@+id/btnToThirdActivity"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Calculate and Show Results" />

    </LinearLayout>
```

activity_third.xml

```
    <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical"
        android:gravity="center"
        android:padding="16dp">

        <TextView
            android:id="@+id/tvResultSum"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Sum: "
            android:textSize="18sp"
            android:layout_marginBottom="8dp" />

        <TextView
            android:id="@+id/tvResultAverage"
            android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:text="Average: "
        android:textSize="18sp"
        android:layout_marginBottom="8dp" />

</LinearLayout>
```

FirstActivity.java

```
package com.example.multiinputapp;

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

public class FirstActivity extends AppCompatActivity {

    private EditText etNumber1, etNumber2;
    private Button btnToSecondActivity;

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

        etNumber1 = findViewById(R.id.etNumber1);
        etNumber2 = findViewById(R.id.etNumber2);
        btnToSecondActivity = findViewById(R.id.btnToSecondActivity);

        btnToSecondActivity.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                double number1 = Double.parseDouble(etNumber1.getText().toString());
                double number2 = Double.parseDouble(etNumber2.getText().toString());

                Intent intent = new Intent(FirstActivity.this, SecondActivity.class);
                intent.putExtra("NUMBER_1", number1);
                intent.putExtra("NUMBER_2", number2);
```

```
                startActivity(intent);
            }
        });
    }
}
```

SecondActivity.java

```
package com.example.multiinputapp;

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

public class SecondActivity extends AppCompatActivity {

    private EditText etNumber3, etNumber4;
    private Button btnToThirdActivity;

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

        etNumber3 = findViewById(R.id.etNumber3);
        etNumber4 = findViewById(R.id.etNumber4);
        btnToThirdActivity = findViewById(R.id.btnToThirdActivity);

        // Retrieve numbers from FirstActivity
        final double number1 = getIntent().getDoubleExtra("NUMBER_1", 0);
        final double number2 = getIntent().getDoubleExtra("NUMBER_2", 0);

        btnToThirdActivity.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                double number3 = Double.parseDouble(etNumber3.getText().toString());
                double number4 = Double.parseDouble(etNumber4.getText().toString());
```

```
            Intent intent = new Intent(SecondActivity.this, ThirdActivity.class);
            intent.putExtra("NUMBER_1", number1);
            intent.putExtra("NUMBER_2", number2);
            intent.putExtra("NUMBER_3", number3);
            intent.putExtra("NUMBER_4", number4);
            startActivity(intent);
        }
    });
  }
}
```

ThirdActivity**.java**

```
package com.example.multiinputapp;

import android.os.Bundle;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class ThirdActivity extends AppCompatActivity {

  private TextView tvResultSum, tvResultAverage;

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

    tvResultSum = findViewById(R.id.tvResultSum);
    tvResultAverage = findViewById(R.id.tvResultAverage);

    // Retrieve numbers from FirstActivity and SecondActivity
    double number1 = getIntent().getDoubleExtra("NUMBER_1", 0);
    double number2 = getIntent().getDoubleExtra("NUMBER_2", 0);
    double number3 = getIntent().getDoubleExtra("NUMBER_3", 0);
    double number4 = getIntent().getDoubleExtra("NUMBER_4", 0);

    // Perform calculations
    double sum = number1 + number2 + number3 + number4;
```

```
        double average = sum / 4;

        // Display results
        tvResultSum.setText("Sum: " + sum);
        tvResultAverage.setText("Average: " + average);
    }
}
```

16. **Create Tables Project (pno, p_name, ptype, duration) and Employee (id, e_name, qualification, join-date), assume Project – employee has a many to many relationship. Using database perform following operation. 1) Add new record into table. 2) Accept a project name from user and display information of employees working on the project**

    DatabaseHelper.java

```
package com.example.projectemployeeapp;

import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;

public class DatabaseHelper extends SQLiteOpenHelper {

    private static final String DATABASE_NAME = "ProjectEmployee.db";
    private static final int DATABASE_VERSION = 1;

    // Table and column names
    private static final String TABLE_PROJECT = "Project";
    private static final String COLUMN_PNO = "pno";
    private static final String COLUMN_PNAME = "p_name";
    private static final String COLUMN_PTYPE = "ptype";
    private static final String COLUMN_DURATION = "duration";

    private static final String TABLE_EMPLOYEE = "Employee";
    private static final String COLUMN_ID = "id";
    private static final String COLUMN_ENAME = "e_name";
```

```
    private static final String COLUMN_QUALIFICATION = "qualification";
    private static final String COLUMN_JOIN_DATE = "join_date";

    private static final String TABLE_PROJECT_EMPLOYEE = "ProjectEmployee";
    private static final String COLUMN_PROJECT_ID = "project_id";
    private static final String COLUMN_EMPLOYEE_ID = "employee_id";

    public DatabaseHelper(Context context) {
        super(context, DATABASE_NAME, null, DATABASE_VERSION);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        // Create Project table
        db.execSQL("CREATE TABLE " + TABLE_PROJECT + " (" +
                COLUMN_PNO + " INTEGER PRIMARY KEY AUTOINCREMENT, " +
                COLUMN_PNAME + " TEXT NOT NULL, " +
                COLUMN_PTYPE + " TEXT, " +
                COLUMN_DURATION + " INTEGER)");

        // Create Employee table
        db.execSQL("CREATE TABLE " + TABLE_EMPLOYEE + " (" +
                COLUMN_ID + " INTEGER PRIMARY KEY AUTOINCREMENT, " +
                COLUMN_ENAME + " TEXT NOT NULL, " +
                COLUMN_QUALIFICATION + " TEXT, " +
                COLUMN_JOIN_DATE + " TEXT)");

        // Create ProjectEmployee table for many-to-many relationship
        db.execSQL("CREATE TABLE " + TABLE_PROJECT_EMPLOYEE + " (" +
                COLUMN_PROJECT_ID + " INTEGER, " +
                COLUMN_EMPLOYEE_ID + " INTEGER, " +
                "FOREIGN KEY (" + COLUMN_PROJECT_ID + ") REFERENCES " +
TABLE_PROJECT + "(" + COLUMN_PNO + "), " +
                "FOREIGN KEY (" + COLUMN_EMPLOYEE_ID + ") REFERENCES " +
TABLE_EMPLOYEE + "(" + COLUMN_ID + "), " +
                "PRIMARY KEY (" + COLUMN_PROJECT_ID + ", " +
COLUMN_EMPLOYEE_ID + "))");
    }

    @Override
```

```
public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
    db.execSQL("DROP TABLE IF EXISTS " + TABLE_PROJECT_EMPLOYEE);
    db.execSQL("DROP TABLE IF EXISTS " + TABLE_EMPLOYEE);
    db.execSQL("DROP TABLE IF EXISTS " + TABLE_PROJECT);
    onCreate(db);
}

// Method to add a new project
public long addProject(String name, String type, int duration) {
    SQLiteDatabase db = this.getWritableDatabase();
    ContentValues values = new ContentValues();
    values.put(COLUMN_PNAME, name);
    values.put(COLUMN_PTYPE, type);
    values.put(COLUMN_DURATION, duration);
    return db.insert(TABLE_PROJECT, null, values);
}

// Method to add a new employee
public long addEmployee(String name, String qualification, String joinDate) {
    SQLiteDatabase db = this.getWritableDatabase();
    ContentValues values = new ContentValues();
    values.put(COLUMN_ENAME, name);
    values.put(COLUMN_QUALIFICATION, qualification);
    values.put(COLUMN_JOIN_DATE, joinDate);
    return db.insert(TABLE_EMPLOYEE, null, values);
}

// Method to assign an employee to a project
public long assignEmployeeToProject(long projectId, long employeeId) {
    SQLiteDatabase db = this.getWritableDatabase();
    ContentValues values = new ContentValues();
    values.put(COLUMN_PROJECT_ID, projectId);
    values.put(COLUMN_EMPLOYEE_ID, employeeId);
    return db.insert(TABLE_PROJECT_EMPLOYEE, null, values);
}

// Method to retrieve employees working on a specified project
public Cursor getEmployeesByProjectName(String projectName) {
    SQLiteDatabase db = this.getReadableDatabase();
```

```
        String query = "SELECT Employee." + COLUMN_ENAME + ", Employee." +
    COLUMN_QUALIFICATION + ", Employee." + COLUMN_JOIN_DATE +
                " FROM " + TABLE_EMPLOYEE + " INNER JOIN " +
    TABLE_PROJECT_EMPLOYEE +
                " ON Employee." + COLUMN_ID + " = ProjectEmployee." +
    COLUMN_EMPLOYEE_ID +
                " INNER JOIN " + TABLE_PROJECT +
                " ON Project." + COLUMN_PNO + " = ProjectEmployee." +
    COLUMN_PROJECT_ID +
                " WHERE Project." + COLUMN_PNAME + " = ?";
        return db.rawQuery(query, new String[]{projectName});
    }
    }
```

MainActivity.java

```
package com.example.projectemployeeapp;

import android.content.Intent;
import android.database.Cursor;
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 {

    private DatabaseHelper dbHelper;
    private EditText etProjectName, etProjectType, etProjectDuration, etEmployeeName,
etEmployeeQualification, etEmployeeJoinDate, etProjectSearch;
    private Button btnAddProject, btnAddEmployee, btnAssignEmployee, btnViewEmployees;

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

        dbHelper = new DatabaseHelper(this);
```

```
        etProjectName = findViewById(R.id.etProjectName);
        etProjectType = findViewById(R.id.etProjectType);
        etProjectDuration = findViewById(R.id.etProjectDuration);
        etEmployeeName = findViewById(R.id.etEmployeeName);
        etEmployeeQualification = findViewById(R.id.etEmployeeQualification);
        etEmployeeJoinDate = findViewById(R.id.etEmployeeJoinDate);
        etProjectSearch = findViewById(R.id.etProjectSearch);

        btnAddProject = findViewById(R.id.btnAddProject);
        btnAddEmployee = findViewById(R.id.btnAddEmployee);
        btnAssignEmployee = findViewById(R.id.btnAssignEmployee);
        btnViewEmployees = findViewById(R.id.btnViewEmployees);

        // Add Project
        btnAddProject.setOnClickListener(v -> {
            String name = etProjectName.getText().toString();
            String type = etProjectType.getText().toString();
            int duration = Integer.parseInt(etProjectDuration.getText().toString());

            long projectId = dbHelper.addProject(name, type, duration);
            if (projectId != -1) {
                Toast.makeText(MainActivity.this, "Project added successfully!",
Toast.LENGTH_SHORT).show();
            }
        });

        // Add Employee
        btnAddEmployee.setOnClickListener(v -> {
            String name = etEmployeeName.getText().toString();
            String qualification = etEmployeeQualification.getText().toString();
            String joinDate = etEmployeeJoinDate.getText().toString();

            long employeeId = dbHelper.addEmployee(name, qualification, joinDate);
            if (employeeId != -1) {
                Toast.makeText(MainActivity.this, "Employee added successfully!",
Toast.LENGTH_SHORT).show();
            }
        });
```

```
        // View Employees by Project
        btnViewEmployees.setOnClickListener(v -> {
            String projectName = etProjectSearch.getText().toString();
            Cursor cursor = dbHelper.getEmployeesByProjectName(projectName);

            if (cursor.moveToFirst()) {
                StringBuilder result = new StringBuilder();
                do {
                    String employeeName = cursor.getString(cursor.getColumnIndex("e_name"));
                    String qualification = cursor.getString(cursor.getColumnIndex("qualification"));
                    String joinDate = cursor.getString(cursor.getColumnIndex("join_date"));
                    result.append("Name: ").append(employeeName).append(", Qualification:
").append(qualification).append(", Join Date: ").append(joinDate).append("\n");
                } while (cursor.moveToNext());

                Intent intent = new Intent(MainActivity.this, EmployeeListActivity.class);
                intent.putExtra("employee_data", result.toString());
                startActivity(intent);
            } else {
                Toast.makeText(MainActivity.this, "No employees found for the project.",
Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

EmployeeListActivity.java

```
package com.example.projectemployeeapp;

import android.os.Bundle;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class EmployeeListActivity extends AppCompatActivity {

    private TextView tvEmployeeList;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
```

```
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_employee_list);

        tvEmployeeList = findViewById(R.id.tvEmployeeList);
        String employeeData = getIntent().getStringExtra("employee_data");
        tvEmployeeList.setText(employeeData);
    }
}
```

17. Create Tables Employee (emp_id, emp_name, emp_desg, emp_salary) Using database perform following operation. 1) Add new record into table. 2) Accept employee name from user and display information of employee.

DatabaseHelper.java

```
package com.example.employeeapp;



import android.content.ContentValues;

import android.content.Context;

import android.database.Cursor;

import android.database.sqlite.SQLiteDatabase;

import android.database.sqlite.SQLiteOpenHelper;



public class DatabaseHelper extends SQLiteOpenHelper {



    private static final String DATABASE_NAME = "EmployeeDB";
```

```
private static final int DATABASE_VERSION = 1;

private static final String TABLE_EMPLOYEE = "Employee";



// Columns for Employee table

private static final String COLUMN_EMP_ID = "emp_id";

private static final String COLUMN_EMP_NAME = "emp_name";

private static final String COLUMN_EMP_DESG = "emp_desg";

private static final String COLUMN_EMP_SALARY = "emp_salary";



public DatabaseHelper(Context context) {

    super(context, DATABASE_NAME, null, DATABASE_VERSION);

}



@Override

public void onCreate(SQLiteDatabase db) {

    // SQL command to create the Employee table

    db.execSQL("CREATE TABLE " + TABLE_EMPLOYEE + " (" +

            COLUMN_EMP_ID + " INTEGER PRIMARY KEY AUTOINCREMENT, " +
```

```
            COLUMN_EMP_NAME + " TEXT NOT NULL, " +
            COLUMN_EMP_DESG + " TEXT, " +
            COLUMN_EMP_SALARY + " REAL)");
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
        db.execSQL("DROP TABLE IF EXISTS " + TABLE_EMPLOYEE);
        onCreate(db);
    }

    // Method to add a new employee record
    public long addEmployee(String name, String designation, double salary) {
        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues values = new ContentValues();
        values.put(COLUMN_EMP_NAME, name);
        values.put(COLUMN_EMP_DESG, designation);
        values.put(COLUMN_EMP_SALARY, salary);
```

```
        return db.insert(TABLE_EMPLOYEE, null, values);
    }

    // Method to get employee details by name
    public Cursor getEmployeeByName(String name) {
        SQLiteDatabase db = this.getReadableDatabase();
        return db.query(TABLE_EMPLOYEE, null, COLUMN_EMP_NAME + " = ?", new
String[]{name}, null, null, null);
    }
}
```

MainActivity.java

```
package com.example.employeeapp;

import android.content.Intent;
import android.database.Cursor;
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 {


    private DatabaseHelper dbHelper;

    private EditText etName, etDesignation, etSalary, etSearchName;

    private Button btnAddEmployee, btnSearchEmployee;


    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);


        dbHelper = new DatabaseHelper(this);


        etName = findViewById(R.id.etName);

        etDesignation = findViewById(R.id.etDesignation);
```

```
        etSalary = findViewById(R.id.etSalary);
        etSearchName = findViewById(R.id.etSearchName);

        btnAddEmployee = findViewById(R.id.btnAddEmployee);
        btnSearchEmployee = findViewById(R.id.btnSearchEmployee);

        // Button to add a new employee
        btnAddEmployee.setOnClickListener(v -> {
            String name = etName.getText().toString();
            String designation = etDesignation.getText().toString();
            double salary = Double.parseDouble(etSalary.getText().toString());

            long empId = dbHelper.addEmployee(name, designation, salary);
            if (empId != -1) {
                Toast.makeText(MainActivity.this, "Employee added successfully!",
Toast.LENGTH_SHORT).show();
                etName.setText("");
                etDesignation.setText("");
```

```
        etSalary.setText("");
    }
});

// Button to search for an employee by name
btnSearchEmployee.setOnClickListener(v -> {
    String searchName = etSearchName.getText().toString();
    Cursor cursor = dbHelper.getEmployeeByName(searchName);

    if (cursor != null && cursor.moveToFirst()) {
        String empName = cursor.getString(cursor.getColumnIndex("emp_name"));
        String empDesg = cursor.getString(cursor.getColumnIndex("emp_desg"));
        double empSalary = cursor.getDouble(cursor.getColumnIndex("emp_salary"));

        // Start EmployeeDetailActivity to display employee information
        Intent intent = new Intent(MainActivity.this, EmployeeDetailActivity.class);
        intent.putExtra("emp_name", empName);
        intent.putExtra("emp_desg", empDesg);
```

```
            intent.putExtra("emp_salary", empSalary);

            startActivity(intent);

        } else {

            Toast.makeText(MainActivity.this, "Employee not found!",
Toast.LENGTH_SHORT).show();

        }

    });

  }

}
```

EmployeeDetailActivity.java

```
package com.example.employeeapp;

import android.os.Bundle;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class EmployeeDetailActivity extends AppCompatActivity {

  private TextView tvEmpName, tvEmpDesg, tvEmpSalary;

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

    tvEmpName = findViewById(R.id.tvEmpName);
    tvEmpDesg = findViewById(R.id.tvEmpDesg);
    tvEmpSalary = findViewById(R.id.tvEmpSalary);

    // Get employee details from intent and display them
```

```
        String empName = getIntent().getStringExtra("emp_name");
        String empDesg = getIntent().getStringExtra("emp_desg");
        double empSalary = getIntent().getDoubleExtra("emp_salary", 0);

        tvEmpName.setText("Name: " + empName);
        tvEmpDesg.setText("Designation: " + empDesg);
        tvEmpSalary.setText("Salary: " + empSalary);
    }
}
```

activity_main.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp">

    <EditText
        android:id="@+id/etName"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Employee Name" />

    <EditText
        android:id="@+id/etDesignation"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Designation" />

    <EditText
```

```
        android:id="@+id/etSalary"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Salary"
        android:inputType="numberDecimal" />

    <Button
        android:id="@+id/btnAddEmployee"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Add Employee" />

    <EditText
        android:id="@+id/etSearchName"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Search Employee by Name" />

    <Button
        android:id="@+id/btnSearchEmployee"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Search Employee" />

</LinearLayout>
```

activity_employee_detail.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp">

    <TextView
        android:id="@+id/tvEmpName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="18sp" />

    <TextView
        android:id="@+id/tvEmpDesg"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="18sp" />

    <TextView
        android:id="@+id/tvEmpSalary"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="18sp" />

</LinearLayout>
```