1) Write an application to create play the background music.

Myservice.java

```
package com.example.backgroundmusic;

import android.app.Service;

import android.content.Intent;

import android.media.MediaPlayer;

import android.os.IBinder;

import androidx.annotation.Nullable;

public class MyService extends Service {

private MediaPlayer player;

@Nullable

@Override

public IBinder onBind(Intent intent) {

return null; // Not a bound service

}

@Override

public int onStartCommand(Intent intent, int flags, int startId) {

if (player == null) {

player = MediaPlayer.create(this, R.raw.audio);

player.setLooping(true); // Loop indefinitely

player.setVolume(0.8f, 0.8f); // Volume between 0.0f and 1.0f

player.start();

}

return START_STICKY; // Restart service if killed

}
```

```
@Override
public void onDestroy() {
super.onDestroy();
if (player != null) {
if (player.isPlaying()) {
player.stop();
}
player.release();
player = null;
}


}
}
```

MainActivity

```
btn1.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
Intent intent=new Intent(MainActivity.this,MyService.class);
startService(intent);
}
});
btn2.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
stopService(new Intent(MainActivity.this,MyService.class));
```

}

Set the below property in androidmanifest file

<service android:name=".MyService"> </service>

app → src → main → res → raw → audio.mp3

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.

1 MainActivity.java

```
package com.example.studentdb;

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

import androidx.appcompat.app.AppCompatActivity;

import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {
```

```
    Button btnInsert, btnShow;
    ListView listView;
    DBHandler dbHandler;

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

    btnInsert = findViewById(R.id.btnInsert);
    btnShow = findViewById(R.id.btnShow);
    listView = findViewById(R.id.listView);

    dbHandler = new DBHandler(MainActivity.this);

    // Insert 5 student records
btnInsert.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
            dbHandler.insertFiveStudents();
    }
    });

    // Show all student details
```

```
        btnShow.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                    ArrayList<String> list = dbHandler.getAllStudents();
                ArrayAdapter<String> adapter = new ArrayAdapter<>(
                    MainActivity.this,
                    android.R.layout.simple_list_item_1,
                    list
                    );
                listView.setAdapter(adapter);
            }
            });
            }
}
```

---

2 DBHandler.java

```
package com.example.studentdb;

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 DBHandler extends SQLiteOpenHelper {

    private static final String DB_NAME = "studentDB";
    private static final int DB_VERSION = 1;
    private static final String TABLE_NAME = "Student";

    public DBHandler(Context context) {
    super(context, DB_NAME, null, DB_VERSION);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
    String query = "CREATE TABLE " + TABLE_NAME +
            " (rollno INTEGER PRIMARY KEY AUTOINCREMENT, " +
            "name TEXT, address TEXT, percentage REAL)";
  db.execSQL(query);
    }

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

```
    // Insert 5 student records
    public void insertFiveStudents() {
    SQLiteDatabase db = this.getWritableDatabase();
    db.execSQL("DELETE FROM " + TABLE_NAME); // clear old data
   insertStudent(db, "Ravi", "Pune", 85.5);
   insertStudent(db, "Sneha", "Mumbai", 90.2);
   insertStudent(db, "Arjun", "Delhi", 78.0);
   insertStudent(db, "Neha", "Nashik", 88.8);
   insertStudent(db, "Vikas", "Nagpur", 92.3);
    db.close();
    }

    private void insertStudent(SQLiteDatabase db, String name, String address, double
percentage) {
    ContentValues values = new ContentValues();
    values.put("name", name);
    values.put("address", address);
    values.put("percentage", percentage);
   db.insert(TABLE_NAME, null, values);
    }

    // Fetch all student records
    public ArrayList<String> getAllStudents() {
   ArrayList<String> list = new ArrayList<>();
    SQLiteDatabase db = this.getReadableDatabase();
```

```
        Cursor cursor = db.rawQuery("SELECT * FROM " + TABLE_NAME, null);
        while (cursor.moveToNext()) {
        int roll = cursor.getInt(0);
        String name = cursor.getString(1);
        String address = cursor.getString(2);
        double percentage = cursor.getDouble(3);
        list.add("Roll No: " + roll + "\nName: " + name +
                "\nAddress: " + address + "\n%: " + percentage);
        }
    cursor.close();
        db.close();
        return list;
        }
}
```

---

3 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">

        <Button
        android:id="@+id/btnInsert"
```

```
        android:layout_width="match_parent"

        android:layout_height="wrap_content"

        android:text="Insert 5 Students" />


        <Button

        android:id="@+id/btnShow"

        android:layout_width="match_parent"

        android:layout_height="wrap_content"

        android:text="Show All Students" />


        <ListView

        android:id="@+id/listView"

        android:layout_width="match_parent"

        android:layout_height="wrap_content"

        android:layout_marginTop="10dp" />

</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.

MainActivity.java

```
package com.example.primecheck;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.*;

public class MainActivity extends AppCompatActivity {
```

```
    EditText editNumber;
    Button btnCheck;
    TextView txtResult;

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

        editNumber = findViewById(R.id.editNumber);
        btnCheck = findViewById(R.id.btnCheck);
        txtResult = findViewById(R.id.txtResult);

        btnCheck.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String input = editNumber.getText().toString();
                if (input.isEmpty()) {
                    txtResult.setText("Enter a number");
                    return;
                }

                int num = Integer.parseInt(input);
                boolean isPrime = true;

                if (num <= 1) isPrime = false;
                else {
                    for (int i = 2; i <= num / 2; i++) {
                        if (num % i == 0) {
                            isPrime = false;
                            break;
                        }
                    }
                }

                if (isPrime)
                    txtResult.setText(num + " is Prime");
                else
                    txtResult.setText(num + " is Not Prime");
            }
        });
    }
}
```

✅ **activity_main.xml (minimal version)**

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

    <EditText
        android:id="@+id/editNumber"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter number"
        android:inputType="number" />

    <Button
        android:id="@+id/btnCheck"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Check Prime" />

    <TextView
        android:id="@+id/txtResult"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />
</LinearLayout>
```

4) Java Android Program to perform all arithmetic Operations using Calculators.

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:padding="10dp"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <TextView
        android:id="@+id/tvResult"
        android:text="0"
        android:textSize="30sp"
        android:gravity="end"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />
```

```
  <GridLayout
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:columnCount="4">

     <Button android:id="@+id/btn1" android:text="1" />
     <Button android:id="@+id/btn2" android:text="2" />
     <Button android:id="@+id/btn3" android:text="3" />
     <Button android:id="@+id/btnAdd" android:text="+" />

     <Button android:id="@+id/btn4" android:text="4" />
     <Button android:id="@+id/btn5" android:text="5" />
     <Button android:id="@+id/btn6" android:text="6" />
     <Button android:id="@+id/btnSub" android:text="-" />

     <Button android:id="@+id/btn7" android:text="7" />
     <Button android:id="@+id/btn8" android:text="8" />
     <Button android:id="@+id/btn9" android:text="9" />
     <Button android:id="@+id/btnMul" android:text="x" />

     <Button android:id="@+id/btn0" android:text="0" />
     <Button android:id="@+id/btnDiv" android:text="/" />
     <Button android:id="@+id/btnDel" android:text="DEL" />
     <Button android:id="@+id/btnEqual" android:text="ANSWER" />
  </GridLayout>
</LinearLayout>


package com.example.calc;

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

public class MainActivity extends AppCompatActivity {

  TextView tvResult;
  String input = "";
  char operator;
  double num1, num2, result;
```

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

    tvResult = findViewById(R.id.tvResult);

    // Number buttons
    View.OnClickListener numberListener = v -> {
        Button b = (Button) v;
        input += b.getText().toString();
        tvResult.setText(input);
    };

    int[] numIds = {R.id.btn0, R.id.btn1, R.id.btn2, R.id.btn3,
            R.id.btn4, R.id.btn5, R.id.btn6, R.id.btn7,
            R.id.btn8, R.id.btn9};

    for (int id : numIds)
        findViewById(id).setOnClickListener(numberListener);

    // Operator buttons
    findViewById(R.id.btnAdd).setOnClickListener(v -> setOperator('+'));
    findViewById(R.id.btnSub).setOnClickListener(v -> setOperator('-'));
    findViewById(R.id.btnMul).setOnClickListener(v -> setOperator('x'));
    findViewById(R.id.btnDiv).setOnClickListener(v -> setOperator('/'));

    // Equal button
    findViewById(R.id.btnEqual).setOnClickListener(v -> calculate());

    // Delete button
    findViewById(R.id.btnDel).setOnClickListener(v -> {
        input = "";
        tvResult.setText("0");
    });
}

void setOperator(char op) {
    num1 = Double.parseDouble(input);
    operator = op;
    input = "";
}

void calculate() {
```

```
        num2 = Double.parseDouble(input);
        switch (operator) {
            case '+': result = num1 + num2; break;
            case '-': result = num1 - num2; break;
            case 'x': result = num1 * num2; break;
            case '/': result = num1 / num2; break;
        }
        tvResult.setText(String.valueOf(result));
        input = String.valueOf(result);
    }
}
```

5) Create an android app to demonstrate gridview.

```
<GridView xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/gridView"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:numColumns="2"/>
```

```
package com.example.gridviewexample;

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

public class MainActivity extends AppCompatActivity {

    GridView gridView;
    String[] items = {"Apple", "Banana", "Cherry", "Mango", "Orange", "Grapes"};

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

        gridView = findViewById(R.id.gridView);

        ArrayAdapter<String> adapter = new ArrayAdapter<>(
                this,
                android.R.layout.simple_list_item_1,
                items
        );
```

```
        gridView.setAdapter(adapter);
    }
}
```

6) Create table Employee (E_id, name, address, pho_no). Create Application for performing the following operation on the table. (Using SQLite database).
i. Insert record of 5 new Employees.
ii. Show all the details of Employee.

MainActivity.java

```
package com.example.employeedb;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.*;
import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {

    EditText nameEdt, addressEdt, phoneEdt;
    Button addBtn, showBtn;
    ListView listView;
    DBHandler dbHandler;

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

        nameEdt = findViewById(R.id.nameEdt);
        addressEdt = findViewById(R.id.addressEdt);
        phoneEdt = findViewById(R.id.phoneEdt);
        addBtn = findViewById(R.id.addBtn);
        showBtn = findViewById(R.id.showBtn);
        listView = findViewById(R.id.listView);

        dbHandler = new DBHandler(this);

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

```
        public void onClick(View v) {
            String name = nameEdt.getText().toString();
            String address = addressEdt.getText().toString();
            String phone = phoneEdt.getText().toString();

            if (name.isEmpty() || address.isEmpty() || phone.isEmpty()) {
                Toast.makeText(MainActivity.this, "Enter all details",
Toast.LENGTH_SHORT).show();
                return;
            }

            dbHandler.addEmployee(name, address, phone);
            Toast.makeText(MainActivity.this, "Employee Added",
Toast.LENGTH_SHORT).show();

            nameEdt.setText("");
            addressEdt.setText("");
            phoneEdt.setText("");
        }
    });

    showBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            ArrayList<String> data = dbHandler.getAllEmployees();
            ArrayAdapter<String> adapter = new ArrayAdapter<>(MainActivity.this,
android.R.layout.simple_list_item_1, data);
            listView.setAdapter(adapter);
        }
    });
  }
}
```

✅ **DBHandler.java**

```
package com.example.employeedb;

import android.content.*;
import android.database.Cursor;
import android.database.sqlite.*;
import java.util.ArrayList;
```

```
public class DBHandler extends SQLiteOpenHelper {

    private static final String DB_NAME = "employeeDB";
    private static final int DB_VERSION = 1;
    private static final String TABLE_NAME = "employee";
    private static final String ID_COL = "E_id";
    private static final String NAME_COL = "name";
    private static final String ADDRESS_COL = "address";
    private static final String PHONE_COL = "pho_no";

    public DBHandler(Context context) {
        super(context, DB_NAME, null, DB_VERSION);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        String query = "CREATE TABLE " + TABLE_NAME + " (" +
                ID_COL + " INTEGER PRIMARY KEY AUTOINCREMENT, " +
                NAME_COL + " TEXT, " +
                ADDRESS_COL + " TEXT, " +
                PHONE_COL + " TEXT)";
        db.execSQL(query);
    }

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

    public void addEmployee(String name, String address, String phone) {
        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues values = new ContentValues();
        values.put(NAME_COL, name);
        values.put(ADDRESS_COL, address);
        values.put(PHONE_COL, phone);
        db.insert(TABLE_NAME, null, values);
        db.close();
    }

    public ArrayList<String> getAllEmployees() {
        ArrayList<String> list = new ArrayList<>();
        SQLiteDatabase db = this.getReadableDatabase();
        Cursor cursor = db.rawQuery("SELECT * FROM " + TABLE_NAME, null);
```

```
        while (cursor.moveToNext()) {
            String data = "ID: " + cursor.getInt(0) +
                    "\nName: " + cursor.getString(1) +
                    "\nAddress: " + cursor.getString(2) +
                    "\nPhone: " + cursor.getString(3);
            list.add(data);
        }
        cursor.close();
        return list;
    }
}
```

✅ **activity_main.xml (only main attributes)**

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:padding="10dp"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

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

    <EditText
        android:id="@+id/addressEdt"
        android:hint="Enter Address"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <EditText
        android:id="@+id/phoneEdt"
        android:hint="Enter Phone"
        android:inputType="number"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <Button
```

```
        android:id="@+id/addBtn"
        android:text="Add Employee"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <Button
        android:id="@+id/showBtn"
        android:text="Show Employees"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <ListView
        android:id="@+id/listView"
        android:layout_width="match_parent"
        android:layout_height="match_parent" />

</LinearLayout>
```

7) Create a Application which shows Life Cycle of Activity.

MainActivity.java

```
package com.example.activitylifecycle;

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

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Toast.makeText(this, "onCreate called", Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onStart() {
        super.onStart();
        Toast.makeText(this, "onStart called", Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onResume() {
```

```
        super.onResume();
        Toast.makeText(this, "onResume called", Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onPause() {
        super.onPause();
        Toast.makeText(this, "onPause called", Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onStop() {
        super.onStop();
        Toast.makeText(this, "onStop called", Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onRestart() {
        super.onRestart();
        Toast.makeText(this, "onRestart called", Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onDestroy() {
        super.onDestroy();
        Toast.makeText(this, "onDestroy called", Toast.LENGTH_SHORT).show();
    }
}
```

✅ **activity_main.xml (only main attributes)**

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

    <TextView
        android:text="Activity Lifecycle Demo"
        android:textSize="20sp"
        android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content" />

</LinearLayout>
```

8) Create table Customer (id, name, address, ph_no). Create Application for performing the following operation on the table. (Using SQLite database).
i. Insert new customer details (At least records).
ii. Show all the customer details

MainActivity.java

```
package com.example.customersqlite;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.*;
import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {

   EditText nameEdt, addressEdt, phoneEdt;
   Button addBtn, showBtn;
   ListView listView;
   DBHandler dbHandler;

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

      nameEdt = findViewById(R.id.nameEdt);
      addressEdt = findViewById(R.id.addressEdt);
      phoneEdt = findViewById(R.id.phoneEdt);
      addBtn = findViewById(R.id.addBtn);
      showBtn = findViewById(R.id.showBtn);
      listView = findViewById(R.id.listView);

      dbHandler = new DBHandler(this);

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

```
        public void onClick(View v) {
            String name = nameEdt.getText().toString();
            String address = addressEdt.getText().toString();
            String phone = phoneEdt.getText().toString();

            if (name.isEmpty() || address.isEmpty() || phone.isEmpty()) {
                Toast.makeText(MainActivity.this, "Enter all details",
Toast.LENGTH_SHORT).show();
                return;
            }

            dbHandler.addCustomer(name, address, phone);
            Toast.makeText(MainActivity.this, "Customer Added",
Toast.LENGTH_SHORT).show();

            nameEdt.setText("");
            addressEdt.setText("");
            phoneEdt.setText("");
        }
    });

    showBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            ArrayList<String> data = dbHandler.getAllCustomers();
            ArrayAdapter<String> adapter = new ArrayAdapter<>(MainActivity.this,
                    android.R.layout.simple_list_item_1, data);
            listView.setAdapter(adapter);
        }
    });
  }
}
```

✅ **DBHandler.java**

```
package com.example.customersqlite;

import android.content.*;
import android.database.Cursor;
import android.database.sqlite.*;
import java.util.ArrayList;
```

```
public class DBHandler extends SQLiteOpenHelper {

    private static final String DB_NAME = "customerDB";
    private static final int DB_VERSION = 1;
    private static final String TABLE_NAME = "customer";
    private static final String ID_COL = "id";
    private static final String NAME_COL = "name";
    private static final String ADDRESS_COL = "address";
    private static final String PHONE_COL = "ph_no";

    public DBHandler(Context context) {
        super(context, DB_NAME, null, DB_VERSION);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        String query = "CREATE TABLE " + TABLE_NAME + " (" +
                ID_COL + " INTEGER PRIMARY KEY AUTOINCREMENT, " +
                NAME_COL + " TEXT, " +
                ADDRESS_COL + " TEXT, " +
                PHONE_COL + " TEXT)";
        db.execSQL(query);
    }

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

    public void addCustomer(String name, String address, String phone) {
        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues values = new ContentValues();
        values.put(NAME_COL, name);
        values.put(ADDRESS_COL, address);
        values.put(PHONE_COL, phone);
        db.insert(TABLE_NAME, null, values);
        db.close();
    }

    public ArrayList<String> getAllCustomers() {
        ArrayList<String> list = new ArrayList<>();
        SQLiteDatabase db = this.getReadableDatabase();
        Cursor cursor = db.rawQuery("SELECT * FROM " + TABLE_NAME, null);
```

```
        while (cursor.moveToNext()) {
            String data = "ID: " + cursor.getInt(0) +
                    "\nName: " + cursor.getString(1) +
                    "\nAddress: " + cursor.getString(2) +
                    "\nPhone: " + cursor.getString(3);
            list.add(data);
        }
        cursor.close();
        return list;
    }
}
```

✅ activity_main.xml (only essential attributes)

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:padding="10dp"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

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

    <EditText
        android:id="@+id/addressEdt"
        android:hint="Enter Address"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <EditText
        android:id="@+id/phoneEdt"
        android:hint="Enter Phone Number"
        android:inputType="number"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <Button
```

```
    android:id="@+id/addBtn"
    android:text="Add Customer"
    android:layout_width="match_parent"
    android:layout_height="wrap_content" />

  <Button
    android:id="@+id/showBtn"
    android:text="Show Customers"
    android:layout_width="match_parent"
    android:layout_height="wrap_content" />

  <ListView
    android:id="@+id/listView"
    android:layout_width="match_parent"
    android:layout_height="match_parent" />

</LinearLayout>
```

9) 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.

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

  <EditText
    android:id="@+id/num1"
    android:hint="Enter First Number"
    android:inputType="number"
    android:layout_width="match_parent"
    android:layout_height="wrap_content" />

  <EditText
    android:id="@+id/num2"
    android:hint="Enter Second Number"
    android:inputType="number"
    android:layout_width="match_parent"
    android:layout_height="wrap_content" />

  <Button
    android:id="@+id/btnPower"
    android:text="Power"
```

```
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

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

MainActivity.java

```
package com.example.poweraverage;

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 {

    EditText num1, num2;
    Button btnPower, btnAverage;

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

        num1 = findViewById(R.id.num1);
        num2 = findViewById(R.id.num2);
        btnPower = findViewById(R.id.btnPower);
        btnAverage = findViewById(R.id.btnAverage);

        btnPower.setOnClickListener(v -> {
            double n1 = Double.parseDouble(num1.getText().toString());
            double n2 = Double.parseDouble(num2.getText().toString());
            double result = Math.pow(n1, n2);
            sendResult("Power", result);
        });

        btnAverage.setOnClickListener(v -> {
```

```
            double n1 = Double.parseDouble(num1.getText().toString());
            double n2 = Double.parseDouble(num2.getText().toString());
            double result = (n1 + n2) / 2;
            sendResult("Average", result);
        });
    }

    private void sendResult(String type, double value) {
        Intent i = new Intent(this, ResultActivity.class);
        i.putExtra("type", type);
        i.putExtra("value", value);
        startActivity(i);
    }
}
```

✅ **activity_result.xml**

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

    <TextView
        android:id="@+id/tvResult"
        android:textSize="20sp"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" />
</LinearLayout>
```

✅ **ResultActivity.java**

```
package com.example.poweraverage;

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

public class ResultActivity extends AppCompatActivity {

    TextView tvResult;
```

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

        tvResult = findViewById(R.id.tvResult);

        String type = getIntent().getStringExtra("type");
        double value = getIntent().getDoubleExtra("value", 0);
        tvResult.setText(type + " Result: " + value);
    }
}
```

Manifest

```
 <activity android:name=".ResultActivity" />
        <activity android:name=".MainActivity">
```

10) Create application using JSON to provide Employee Information.

MainActivity.java

```
package com.example.jsonexample;

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

import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;

public class MainActivity extends AppCompatActivity {

    TextView textView;

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

        textView = findViewById(R.id.textView);

        // Sample JSON data
```

```
        String jsonData = "{ \"employees\": [" +
                "{\"id\":1, \"name\":\"John\", \"address\":\"New York\", \"salary\":50000}," +
                "{\"id\":2, \"name\":\"Emma\", \"address\":\"London\", \"salary\":60000}," +
                "{\"id\":3, \"name\":\"Raj\", \"address\":\"Delhi\", \"salary\":55000}" +
                "]}";

        try {
            JSONObject jsonObject = new JSONObject(jsonData);
            JSONArray jsonArray = jsonObject.getJSONArray("employees");

            StringBuilder builder = new StringBuilder();

            for (int i = 0; i < jsonArray.length(); i++) {
                JSONObject emp = jsonArray.getJSONObject(i);
                builder.append("ID: ").append(emp.getInt("id")).append("\n");
                builder.append("Name: ").append(emp.getString("name")).append("\n");
                builder.append("Address: ").append(emp.getString("address")).append("\n");
                builder.append("Salary: ").append(emp.getInt("salary")).append("\n\n");
            }

            textView.setText(builder.toString());

        } catch (JSONException e) {
            e.printStackTrace();
            textView.setText("Error parsing JSON!");
        }
    }
}
```

✅ **activity_main.xml (only main attributes)**

```
<?xml version="1.0" encoding="utf-8"?>
<TextView xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/textView"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp" />
```

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

```
package com.example.numbercheck;
```

```
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.*;

public class MainActivity extends AppCompatActivity {

    EditText editNumber;
    Button btnArmstrong, btnPerfect;
    TextView txtResult;

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

        editNumber = findViewById(R.id.editNumber);
        btnArmstrong = findViewById(R.id.btnArmstrong);
        btnPerfect = findViewById(R.id.btnPerfect);
        txtResult = findViewById(R.id.txtResult);

        btnArmstrong.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                int num = Integer.parseInt(editNumber.getText().toString());
                if (isArmstrong(num))
                    txtResult.setText(num + " is an Armstrong Number");
                else
                    txtResult.setText(num + " is NOT an Armstrong Number");
            }
        });

        btnPerfect.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                int num = Integer.parseInt(editNumber.getText().toString());
                if (isPerfect(num))
                    txtResult.setText(num + " is a Perfect Number");
                else
                    txtResult.setText(num + " is NOT a Perfect Number");
            }
        });
    }
```

```
    boolean isArmstrong(int n) {
        int temp = n, sum = 0, digits = 0;
        int t = n;
        while (t != 0) {
            t /= 10;
            digits++;
        }
        while (n != 0) {
            int r = n % 10;
            sum += Math.pow(r, digits);
            n /= 10;
        }
        return sum == temp;
    }

    boolean isPerfect(int n) {
        int sum = 0;
        for (int i = 1; i < n; i++) {
            if (n % i == 0)
                sum += i;
        }
        return sum == n;
    }
}
```

✅ activity_main.xml (only main attributes)

xml

Copy code

```
<?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">

    <EditText
        android:id="@+id/editNumber"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter a number"
        android:inputType="number" />

    <Button
        android:id="@+id/btnArmstrong"
```

```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Check Armstrong" />

    <Button
        android:id="@+id/btnPerfect"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Check Perfect" />

    <TextView
        android:id="@+id/txtResult"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:textSize="18sp"
        android:paddingTop="10dp" />
</LinearLayout>
```

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

MainActivity.java

```
package com.example.listviewdemo;

import android.os.Bundle;
import android.view.View;
import android.widget.*;
import androidx.appcompat.app.AppCompatActivity;
import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {

    EditText inputEdt;
    Button addBtn, deleteBtn, searchBtn;
    ListView listView;
    ArrayList<String> items;
    ArrayAdapter<String> adapter;

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

```
        inputEdt = findViewById(R.id.inputEdt);
        addBtn = findViewById(R.id.addBtn);
        deleteBtn = findViewById(R.id.deleteBtn);
        searchBtn = findViewById(R.id.searchBtn);
        listView = findViewById(R.id.listView);

        items = new ArrayList<>();
        adapter = new ArrayAdapter<>(this, android.R.layout.simple_list_item_1, items);
        listView.setAdapter(adapter);

        addBtn.setOnClickListener(v -> {
            String value = inputEdt.getText().toString();
            if (!value.isEmpty()) {
                items.add(value);
                adapter.notifyDataSetChanged();
                inputEdt.setText("");
                Toast.makeText(this, "Item Added", Toast.LENGTH_SHORT).show();
            }
        });

        deleteBtn.setOnClickListener(v -> {
            String value = inputEdt.getText().toString();
            if (items.remove(value)) {
                adapter.notifyDataSetChanged();
                Toast.makeText(this, "Item Deleted", Toast.LENGTH_SHORT).show();
            } else {
                Toast.makeText(this, "Item Not Found", Toast.LENGTH_SHORT).show();
            }
        });

        searchBtn.setOnClickListener(v -> {
            String value = inputEdt.getText().toString();
            if (items.contains(value)) {
                Toast.makeText(this, "Item Found", Toast.LENGTH_SHORT).show();
            } else {
                Toast.makeText(this, "Item Not Found", Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

🧩 **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="10dp">

    <EditText
        android:id="@+id/inputEdt"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter item" />

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

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

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

    <ListView
        android:id="@+id/listView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

</LinearLayout>
```

13) Create an application to demonstrate login form with validation

13) Create an application to demonstrate login form with validation.

MainActivity.java

```
package com.example.loginvalidation;

import android.os.Bundle;
import android.view.View;
import android.widget.*;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    EditText emailEdt, passwordEdt;
    Button loginBtn;
    TextView signupTxt;

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

        emailEdt = findViewById(R.id.emailEdt);
        passwordEdt = findViewById(R.id.passwordEdt);
        loginBtn = findViewById(R.id.loginBtn);
        signupTxt = findViewById(R.id.signupTxt);

        loginBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String email = emailEdt.getText().toString().trim();
                String password = passwordEdt.getText().toString().trim();
```

```
            if (email.isEmpty() || password.isEmpty()) {
                Toast.makeText(MainActivity.this, "Please enter all fields",
Toast.LENGTH_SHORT).show();
            } else if (!android.util.Patterns.EMAIL_ADDRESS.matcher(email).matches()) {
                Toast.makeText(MainActivity.this, "Enter valid email",
Toast.LENGTH_SHORT).show();
            } else if (password.length() < 6) {
                Toast.makeText(MainActivity.this, "Password must be at least 6 characters",
Toast.LENGTH_SHORT).show();
            } else {
                Toast.makeText(MainActivity.this, "Login Successful",
Toast.LENGTH_SHORT).show();
            }
        }
    });

    signupTxt.setOnClickListener(v ->
            Toast.makeText(MainActivity.this, "Sign up clicked",
Toast.LENGTH_SHORT).show());
  }
}
```

🧩 **activity_main.xml (basic version)**

```
<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/emailEdt"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Email"
    android:inputType="textEmailAddress" />

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

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

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

    <TextView
        android:id="@+id/signupTxt"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Not a member? Sign up now." />

</LinearLayout>
```

14) Create an application Which reads the person greet message from one activity and display
the Greet message on another activity on click of Button (Use Intent).

MainActivity.java

```
package com.example.greetapp;

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

public class MainActivity extends AppCompatActivity {
    EditText etMessage;
    Button btnSend;

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

        etMessage = findViewById(R.id.etMessage);
        btnSend = findViewById(R.id.btnSend);
```

```
        btnSend.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String message = etMessage.getText().toString();
                Intent intent = new Intent(MainActivity.this, SecondActivity.class);
                intent.putExtra("greet", message);
                startActivity(intent);
            }
        });
    }
}
```

SecondActivity.java

```
package com.example.greetapp;

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

public class SecondActivity extends AppCompatActivity {
    TextView tvGreet;

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

        tvGreet = findViewById(R.id.tvGreet);

        String message = getIntent().getStringExtra("greet");
        tvGreet.setText(message);
    }
}
```

---

activity_main.xml (very basic — only essential attributes)

```
<?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">

    <EditText
        android:id="@+id/etMessage"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter greet message" />

    <Button
        android:id="@+id/btnSend"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Send"
        android:layout_gravity="center_horizontal"
        android:layout_marginTop="16dp" />

</LinearLayout>
```

15) Create an application to change Font Size, Color and Font Family of String

```
package com.example.fontchanger;

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

public class MainActivity extends AppCompatActivity {

    TextView textView;
    Spinner colorSpinner, fontSpinner;
    SeekBar sizeSeekBar;

    String[] colors = {"Black", "Red", "Blue", "Green"};
    String[] fonts = {"DEFAULT", "MONOSPACE", "SANS_SERIF", "SERIF"};

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

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

        textView = findViewById(R.id.textView);
        colorSpinner = findViewById(R.id.colorSpinner);
        fontSpinner = findViewById(R.id.fontSpinner);
        sizeSeekBar = findViewById(R.id.sizeSeekBar);

        // Spinner for colors
        ArrayAdapter<String> colorAdapter = new ArrayAdapter<>(this,
android.R.layout.simple_spinner_item, colors);

colorAdapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item)
;
        colorSpinner.setAdapter(colorAdapter);

        // Spinner for fonts
        ArrayAdapter<String> fontAdapter = new ArrayAdapter<>(this,
android.R.layout.simple_spinner_item, fonts);

fontAdapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
        fontSpinner.setAdapter(fontAdapter);

        // Change text color
        colorSpinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
            @Override
            public void onItemSelected(AdapterView<?> parent, View view, int position, long id)
{
                switch (colors[position]) {
                    case "Red":
                        textView.setTextColor(Color.RED);
                        break;
                    case "Blue":
                        textView.setTextColor(Color.BLUE);
                        break;
                    case "Green":
                        textView.setTextColor(Color.GREEN);
                        break;
                    default:
                        textView.setTextColor(Color.BLACK);
                        break;
                }
            }
```

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

    // Change font family
    fontSpinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
        @Override
        public void onItemSelected(AdapterView<?> parent, View view, int position, long id)
{
            switch (fonts[position]) {
                case "MONOSPACE":
                    textView.setTypeface(Typeface.MONOSPACE);
                    break;
                case "SANS_SERIF":
                    textView.setTypeface(Typeface.SANS_SERIF);
                    break;
                case "SERIF":
                    textView.setTypeface(Typeface.SERIF);
                    break;
                default:
                    textView.setTypeface(Typeface.DEFAULT);
                    break;
            }
        }

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

    // Change font size
    sizeSeekBar.setOnSeekBarChangeListener(new SeekBar.OnSeekBarChangeListener() {
        @Override
        public void onProgressChanged(SeekBar seekBar, int progress, boolean fromUser) {
            textView.setTextSize(progress + 10); // base size 10sp
        }

        @Override
        public void onStartTrackingTouch(SeekBar seekBar) {}

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

activity_main.xml (basic and clean)

```
<?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">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Sample Text"
        android:textSize="20sp"
        android:layout_gravity="center_horizontal"
        android:layout_marginBottom="16dp" />

    <Spinner
        android:id="@+id/colorSpinner"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        />

    <Spinner
        android:id="@+id/fontSpinner"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="8dp"
        />

    <SeekBar
        android:id="@+id/sizeSeekBar"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:max="40"
        android:layout_marginTop="16dp" />

</LinearLayout>
```

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

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">

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

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

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

    <EditText
        android:id="@+id/ageInput"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Age"
        android:inputType="number" />

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

    <Button
```

```
        android:id="@+id/registerBtn"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Register" />

</LinearLayout>
```

🟩 MainActivity.java

```
package com.example.registrationform;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.*;
import android.view.View;

public class MainActivity extends AppCompatActivity {

    EditText nameInput, emailInput, passwordInput, ageInput, mobileInput;
    Button registerBtn;

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

        nameInput = findViewById(R.id.nameInput);
        emailInput = findViewById(R.id.emailInput);
        passwordInput = findViewById(R.id.passwordInput);
        ageInput = findViewById(R.id.ageInput);
        mobileInput = findViewById(R.id.mobileInput);
        registerBtn = findViewById(R.id.registerBtn);

        registerBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                validateFields();
            }
        });
    }

    private void validateFields() {
```

```
        String name = nameInput.getText().toString().trim();
        String email = emailInput.getText().toString().trim();
        String password = passwordInput.getText().toString().trim();
        String ageStr = ageInput.getText().toString().trim();
        String mobile = mobileInput.getText().toString().trim();

        if (name.isEmpty() || email.isEmpty() || password.isEmpty() || ageStr.isEmpty() ||
mobile.isEmpty()) {
            Toast.makeText(this, "All fields are required", Toast.LENGTH_SHORT).show();
            return;
        }

        if (!android.util.Patterns.EMAIL_ADDRESS.matcher(email).matches()) {
            Toast.makeText(this, "Invalid Email", Toast.LENGTH_SHORT).show();
            return;
        }

        if (password.length() < 6) {
            Toast.makeText(this, "Password must be at least 6 characters",
Toast.LENGTH_SHORT).show();
            return;
        }

        int age = Integer.parseInt(ageStr);
        if (age < 18) {
            Toast.makeText(this, "Age must be 18 or above", Toast.LENGTH_SHORT).show();
            return;
        }

        if (mobile.length() != 10) {
            Toast.makeText(this, "Enter valid 10-digit Mobile Number",
Toast.LENGTH_SHORT).show();
            return;
        }

        Toast.makeText(this, "Registration Successful!", Toast.LENGTH_LONG).show();
    }
}
```

17) Create an Android Application to accept a number and display the multiplication table
(Use table Layout).

activity_main.xml

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

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical"
        android:padding="16dp">

        <EditText
            android:id="@+id/numberInput"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Enter a number"
            android:inputType="number" />

        <Button
            android:id="@+id/generateBtn"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Show Table" />

        <TableLayout
            android:id="@+id/tableLayout"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:stretchColumns="1"
            android:paddingTop="10dp" />

    </LinearLayout>
</ScrollView>
```

🟩 **MainActivity.java**

```
package com.example.multiplicationtable;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
```

```
import android.widget.*;
import android.view.View;

public class MainActivity extends AppCompatActivity {

    EditText numberInput;
    Button generateBtn;
    TableLayout tableLayout;

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

        numberInput = findViewById(R.id.numberInput);
        generateBtn = findViewById(R.id.generateBtn);
        tableLayout = findViewById(R.id.tableLayout);

        generateBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                tableLayout.removeAllViews();
                String input = numberInput.getText().toString().trim();

                if (input.isEmpty()) {
                    Toast.makeText(MainActivity.this, "Enter a number",
Toast.LENGTH_SHORT).show();
                    return;
                }

                int num = Integer.parseInt(input);

                for (int i = 1; i <= 10; i++) {
                    TableRow row = new TableRow(MainActivity.this);

                    TextView textView = new TextView(MainActivity.this);
                    textView.setText(num + " × " + i + " = " + (num * i));
                    textView.setPadding(10, 10, 10, 10);

                    row.addView(textView);
                    tableLayout.addView(row);
                }
            }
        });
```

```
    }
}
```

18) Create table Student (id, name, address, phno). Create Application for performing the following operation on the table.
i) Insert New Student Details.
ii) Show All the Students Details.

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">

    <EditText
        android:id="@+id/idInput"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Student ID"
        android:inputType="number" />

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

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

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

```
    <Button
        android:id="@+id/insertBtn"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Insert Student" />

    <Button
        android:id="@+id/showBtn"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Show All Students" />

    <TextView
        android:id="@+id/resultView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:paddingTop="10dp" />

</LinearLayout>
```

🟩 **MainActivity.java**

```
package com.example.studentdb;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.*;
import android.view.View;
import android.database.Cursor;

public class MainActivity extends AppCompatActivity {

    EditText idInput, nameInput, addressInput, phoneInput;
    Button insertBtn, showBtn;
    TextView resultView;
    DBHelper dbHelper;

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

```
        idInput = findViewById(R.id.idInput);
        nameInput = findViewById(R.id.nameInput);
        addressInput = findViewById(R.id.addressInput);
        phoneInput = findViewById(R.id.phoneInput);
        insertBtn = findViewById(R.id.insertBtn);
        showBtn = findViewById(R.id.showBtn);
        resultView = findViewById(R.id.resultView);

        dbHelper = new DBHelper(this);

        insertBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String id = idInput.getText().toString();
                String name = nameInput.getText().toString();
                String address = addressInput.getText().toString();
                String phone = phoneInput.getText().toString();

                boolean inserted = dbHelper.insertStudent(id, name, address, phone);
                if (inserted)
                    Toast.makeText(MainActivity.this, "Student Inserted",
Toast.LENGTH_SHORT).show();
                else
                    Toast.makeText(MainActivity.this, "Error inserting data",
Toast.LENGTH_SHORT).show();
            }
        });

        showBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Cursor cursor = dbHelper.getAllStudents();
                if (cursor.getCount() == 0) {
                    resultView.setText("No records found");
                    return;
                }
                StringBuilder sb = new StringBuilder();
                while (cursor.moveToNext()) {
                    sb.append("ID: ").append(cursor.getString(0)).append("\n");
                    sb.append("Name: ").append(cursor.getString(1)).append("\n");
                    sb.append("Address: ").append(cursor.getString(2)).append("\n");
                    sb.append("Phone: ").append(cursor.getString(3)).append("\n\n");
                }
                resultView.setText(sb.toString());
```

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

🟩 DBHelper.java

```
package com.example.studentdb;

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

public class DBHelper extends SQLiteOpenHelper {

  private static final String DB_NAME = "StudentDB";
  private static final int DB_VERSION = 1;

  public DBHelper(Context context) {
    super(context, DB_NAME, null, DB_VERSION);
  }

  @Override
  public void onCreate(SQLiteDatabase db) {
    db.execSQL("CREATE TABLE Student(id INTEGER PRIMARY KEY, name TEXT,
address TEXT, phno TEXT)");
  }

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

  public boolean insertStudent(String id, String name, String address, String phno) {
    SQLiteDatabase db = this.getWritableDatabase();
    ContentValues cv = new ContentValues();
    cv.put("id", id);
    cv.put("name", name);
    cv.put("address", address);
```

```
        cv.put("phno", phno);
        long result = db.insert("Student", null, cv);
        return result != -1;
    }

    public Cursor getAllStudents() {
        SQLiteDatabase db = this.getReadableDatabase();
        return db.rawQuery("SELECT * FROM Student", null);
    }
}
```

19) Create an application that Demonstrates List View and Onclick of List Display with Toast Message.

MainActivity.java

```
package com.example.listviewtoast;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    ListView listView;
    String[] languages = {"Android", "Java", "PHP", "Hadoop", "SAP", "Python", "Ajax",
"C++", "Ruby on Rails"};

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

        listView = findViewById(R.id.listView);

        // Create adapter
        ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
android.R.layout.simple_list_item_1, languages);
        listView.setAdapter(adapter);
```

```
        // Handle item click
        listView.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
                String selectedItem = languages[position];
                Toast.makeText(MainActivity.this, "You selected: " + selectedItem,
Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

---

activity_main.xml

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

    <ListView
        android:id="@+id/listView"
        android:layout_width="match_parent"
        android:layout_height="match_parent" />
</LinearLayout>
```

20) Create an application to send and receive messages using SMS Manager.

MainActivity.java

```
package com.example.smsdemo;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
```

```
    EditText editPhone, editMessage;
    Button btnSend;

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

        editPhone = findViewById(R.id.editPhone);
        editMessage = findViewById(R.id.editMessage);
        btnSend = findViewById(R.id.btnSend);

        btnSend.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String phoneNo = editPhone.getText().toString();
                String message = editMessage.getText().toString();

                if (phoneNo.isEmpty() || message.isEmpty()) {
                    Toast.makeText(MainActivity.this, "Enter phone and message",
Toast.LENGTH_SHORT).show();
                } else {
                    try {
                        SmsManager smsManager = SmsManager.getDefault();
                        smsManager.sendTextMessage(phoneNo, null, message, null, null);
                        Toast.makeText(MainActivity.this, "Message Sent!",
Toast.LENGTH_SHORT).show();
                    } catch (Exception e) {
                        Toast.makeText(MainActivity.this, "Failed to send message",
Toast.LENGTH_SHORT).show();
                        e.printStackTrace();
                    }
                }
            }
        });
    }
}
```

---

activity_main.xml

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

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

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

    <EditText
        android:id="@+id/editMessage"
        android:hint="Enter Message"
        android:inputType="textMultiLine"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>

    <Button
        android:id="@+id/btnSend"
        android:text="Send SMS"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>
</LinearLayout>
```

SMSReceiver.java

```
package com.example.smsdemo;

import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.os.Bundle;
import android.telephony.SmsMessage;
import android.widget.Toast;

public class SMSReceiver extends BroadcastReceiver {

    @Override
```

```
    public void onReceive(Context context, Intent intent) {
        Bundle bundle = intent.getExtras();
        if (bundle != null) {
            Object[] pdus = (Object[]) bundle.get("pdus");
            if (pdus != null) {
                for (Object pdu : pdus) {
                    SmsMessage smsMessage = SmsMessage.createFromPdu((byte[]) pdu);
                    String sender = smsMessage.getDisplayOriginatingAddress();
                    String messageBody = smsMessage.getMessageBody();
                    Toast.makeText(context, "From: " + sender + "\nMessage: " + messageBody,
Toast.LENGTH_LONG).show();
                }
            }
        }
    }
}
```

Manifest file

```
<uses-permission android:name="android.permission.SEND_SMS"/>
<uses-permission android:name="android.permission.RECEIVE_SMS"/>
<uses-permission android:name="android.permission.READ_SMS"/>

<application ...>
    <receiver android:name=".SMSReceiver">
        <intent-filter>
            <action android:name="android.provider.Telephony.SMS_RECEIVED"/>
        </intent-filter>
    </receiver>
</application>
```

21) Design an application for login activity. Write android code to check login credentials with username = “mca” and password = “android”. Display appropriate toast message to the user.

MainActivity.java

```
package com.example.loginapp;

import androidx.appcompat.app.AppCompatActivity;
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 {

    EditText editUsername, editPassword;
    Button btnLogin;

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

        editUsername = findViewById(R.id.editUsername);
        editPassword = findViewById(R.id.editPassword);
        btnLogin = findViewById(R.id.btnLogin);

        btnLogin.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String user = editUsername.getText().toString().trim();
                String pass = editPassword.getText().toString().trim();

                if (user.equals("mca") && pass.equals("android")) {
                    Toast.makeText(MainActivity.this, "Login Successful",
Toast.LENGTH_SHORT).show();
                } else {
                    Toast.makeText(MainActivity.this, "Invalid Credentials",
Toast.LENGTH_SHORT).show();
                }
            }
        });
    }
}
```

---

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:padding="16dp"
    android:layout_width="match_parent"
```

```
    android:layout_height="match_parent">

    <EditText
        android:id="@+id/editUsername"
        android:hint="Enter Username"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>

    <EditText
        android:id="@+id/editPassword"
        android:hint="Enter Password"
        android:inputType="textPassword"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="8dp"/>

    <Button
        android:id="@+id/btnLogin"
        android:text="Login"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="12dp"/>

</LinearLayout>
```

22) Calc

MainActivity.java

```
package com.example.simplecalculator;

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

public class MainActivity extends AppCompatActivity {

    EditText editText;
    String input = "";
    double num1 = 0, num2 = 0;
    char operator;
```

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

    editText = findViewById(R.id.editText);
    editText.setEnabled(false);

    int[] numberIds = {R.id.btn0, R.id.btn1, R.id.btn2, R.id.btn3, R.id.btn4,
            R.id.btn5, R.id.btn6, R.id.btn7, R.id.btn8, R.id.btn9};

    View.OnClickListener numberClickListener = new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            Button b = (Button) v;
            input += b.getText().toString();
            editText.setText(input);
        }
    };

    for (int id : numberIds) {
        findViewById(id).setOnClickListener(numberClickListener);
    }

    findViewById(R.id.btnAdd).setOnClickListener(v -> setOperator('+'));
    findViewById(R.id.btnSub).setOnClickListener(v -> setOperator('-'));
    findViewById(R.id.btnMul).setOnClickListener(v -> setOperator('*'));
    findViewById(R.id.btnDiv).setOnClickListener(v -> setOperator('/'));
    findViewById(R.id.btnEqual).setOnClickListener(v -> calculateResult());
    findViewById(R.id.btnClear).setOnClickListener(v -> clearAll());
}

private void setOperator(char op) {
    if (!input.isEmpty()) {
        num1 = Double.parseDouble(input);
        operator = op;
        input = "";
        editText.setText("");
    }
}

private void calculateResult() {
    if (!input.isEmpty()) {
        num2 = Double.parseDouble(input);
```

```
            double result = 0;
            switch (operator) {
                case '+': result = num1 + num2; break;
                case '-': result = num1 - num2; break;
                case '*': result = num1 * num2; break;
                case '/': result = (num2 != 0) ? num1 / num2 : 0; break;
            }
            editText.setText(String.valueOf(result));
            input = "";
        }
    }

    private void clearAll() {
        input = "";
        num1 = num2 = 0;
        editText.setText("");
    }
}
```

✅ activity_main.xml

(Looks like your image — simple grid layout with no extra styling)

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

    <EditText
        android:id="@+id/editText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="0"
        android:inputType="none"
        android:gravity="right"
        android:layout_marginBottom="10dp" />

    <TableLayout
        android:layout_width="match_parent"
```

```
    android:layout_height="wrap_content">

    <TableRow>
        <Button android:id="@+id/btn1" android:text="1" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btn2" android:text="2" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btn3" android:text="3" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btnAdd" android:text="+" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
    </TableRow>

    <TableRow>
        <Button android:id="@+id/btn4" android:text="4" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btn5" android:text="5" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btn6" android:text="6" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btnSub" android:text="-" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
    </TableRow>

    <TableRow>
        <Button android:id="@+id/btn7" android:text="7" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btn8" android:text="8" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btn9" android:text="9" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btnMul" android:text="*" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
    </TableRow>

    <TableRow>
        <Button android:id="@+id/btn0" android:text="0" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btnClear" android:text="C" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btnEqual" android:text="=" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
        <Button android:id="@+id/btnDiv" android:text="/" android:layout_width="0dp"
android:layout_weight="1" android:layout_height="wrap_content"/>
```

```
        </TableRow>
    </TableLayout>
</LinearLayout>
```

23) Create an Android Application to find the factorial of a number and Display the Result on alert box.

MainActivity.java

```
package com.example.factorialapp;

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

public class MainActivity extends AppCompatActivity {

    EditText numberInput;
    Button btnCalculate;

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

        numberInput = findViewById(R.id.numberInput);
        btnCalculate = findViewById(R.id.btnCalculate);

        btnCalculate.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String numStr = numberInput.getText().toString();

                if (numStr.isEmpty()) {
                    showMessage("Error", "Please enter a number");
                    return;
                }

                int num = Integer.parseInt(numStr);
                long fact = 1;
```

```
            for (int i = 1; i <= num; i++) {
                fact *= i;
            }

            showMessage("Factorial Result", "Factorial of " + num + " is " + fact);
        }
    });
  }

  private void showMessage(String title, String message) {
    AlertDialog.Builder builder = new AlertDialog.Builder(MainActivity.this);
    builder.setTitle(title);
    builder.setMessage(message);
    builder.setPositiveButton("OK", null);
    builder.show();
  }
}
```

✅ **activity_main.xml**

(Only main attributes, very basic)

```
<?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">

  <EditText
    android:id="@+id/numberInput"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter a number"
    android:inputType="number" />

  <Button
    android:id="@+id/btnCalculate"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Find Factorial" />
```

```
</LinearLayout>
```

24) Create Table Student (Rollno, Name, Class, contact). Create an Android Application for performing the insert and display operation on the table. (Using SQLite Database).

activity_main.xml

Keep it simple — one layout with input fields and two buttons.

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

    <EditText
        android:id="@+id/rollno"
        android:hint="Roll Number"
        android:inputType="number"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

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

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

    <EditText
        android:id="@+id/contact"
        android:hint="Contact"
        android:inputType="phone"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <Button
```

```
        android:id="@+id/insertBtn"
        android:text="Insert"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <Button
        android:id="@+id/displayBtn"
        android:text="Display All"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

</LinearLayout>
```

🧠 2. MainActivity.java

```
package com.example.studentdb;

import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;
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 {

    EditText rollno, name, className, contact;
    Button insertBtn, displayBtn;
    SQLiteDatabase db;

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

        rollno = findViewById(R.id.rollno);
        name = findViewById(R.id.name);
        className = findViewById(R.id.className);
        contact = findViewById(R.id.contact);
```

```
        insertBtn = findViewById(R.id.insertBtn);
        displayBtn = findViewById(R.id.displayBtn);

        // Create Database
        db = openOrCreateDatabase("StudentDB", MODE_PRIVATE, null);
        db.execSQL("CREATE TABLE IF NOT EXISTS Student(rollno INTEGER PRIMARY
KEY, name TEXT, class TEXT, contact TEXT)");

        insertBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String r = rollno.getText().toString();
                String n = name.getText().toString();
                String c = className.getText().toString();
                String con = contact.getText().toString();

                if (r.isEmpty() || n.isEmpty() || c.isEmpty() || con.isEmpty()) {
                    Toast.makeText(MainActivity.this, "Please enter all fields",
Toast.LENGTH_SHORT).show();
                    return;
                }

                db.execSQL("INSERT INTO Student VALUES(" + r + ", '" + n + "', '" + c + "', '" +
con + "')");
                Toast.makeText(MainActivity.this, "Record Inserted",
Toast.LENGTH_SHORT).show();

                rollno.setText("");
                name.setText("");
                className.setText("");
                contact.setText("");
            }
        });

        displayBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Cursor c = db.rawQuery("SELECT * FROM Student", null);
                if (c.getCount() == 0) {
                    showMessage("Error", "No records found");
                    return;
                }

                StringBuilder buffer = new StringBuilder();
```

```
            while (c.moveToNext()) {
                buffer.append("Roll No: ").append(c.getInt(0)).append("\n");
                buffer.append("Name: ").append(c.getString(1)).append("\n");
                buffer.append("Class: ").append(c.getString(2)).append("\n");
                buffer.append("Contact: ").append(c.getString(3)).append("\n\n");
            }

            showMessage("Student Records", buffer.toString());
        }
    });
  }

  public void showMessage(String title, String message) {
    AlertDialog.Builder builder = new AlertDialog.Builder(this);
    builder.setCancelable(true);
    builder.setTitle(title);
    builder.setMessage(message);
    builder.show();
  }
}
```

25) Create an application to find the factorial of a number and Display the Result on another activity.

activity_main.xml

This is the first screen where the user enters a number.

```
<?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="20dp">

  <EditText
    android:id="@+id/numberInput"
    android:hint="Enter a number"
    android:inputType="number"
    android:layout_width="match_parent"
    android:layout_height="wrap_content" />

  <Button
```

```
        android:id="@+id/calcButton"
        android:text="Find Factorial"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

</LinearLayout>
```

🧠 2. MainActivity.java

```
package com.example.factorialapp;

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

public class MainActivity extends AppCompatActivity {

    EditText numberInput;
    Button calcButton;

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

        numberInput = findViewById(R.id.numberInput);
        calcButton = findViewById(R.id.calcButton);

        calcButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String numStr = numberInput.getText().toString();

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

```
            int num = Integer.parseInt(numStr);
            long fact = 1;

            for (int i = 1; i <= num; i++) {
                fact *= i;
            }

            // Send result to another activity
            Intent intent = new Intent(MainActivity.this, ResultActivity.class);
            intent.putExtra("result", fact);
            startActivity(intent);
        }
    });
  }
}
```

🗒️ 3. activity_result.xml

This layout will show the factorial result.

```
<?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:gravity="center"
    android:orientation="vertical">

    <TextView
        android:id="@+id/resultText"
        android:text="Result will appear here"
        android:textSize="18sp"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" />
</LinearLayout>
```

📱 4. ResultActivity.java

```
package com.example.factorialapp;

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

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

public class ResultActivity extends AppCompatActivity {

    TextView resultText;

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

        resultText = findViewById(R.id.resultText);

        // Get data from Intent
        long result = getIntent().getLongExtra("result", 0);
        resultText.setText("Factorial: " + result);
    }
}
```

AndroidManifest.xml

Add the second activity inside the <application> tag:

```
<application
    ... >

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

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

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="20dp">

    <TextView
        android:id="@+id/title"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Bank Menu"
        android:textSize="22sp"
        android:layout_gravity="center_horizontal"
        android:layout_marginBottom="20dp" />

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

    <Button
        android:id="@+id/btnWithdraw"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Withdraw"
        android:layout_marginTop="10dp" />

    <Button
        android:id="@+id/btnCheckBalance"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Check Balance"
        android:layout_marginTop="10dp" />

    <Button
        android:id="@+id/btnExit"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Exit"
        android:layout_marginTop="10dp" />
</LinearLayout>
```

MainActivity.java

```
package com.example.bankapp;
```

```
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.Button;
import android.widget.Toast;
import android.app.AlertDialog;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity {

    Button btnDeposit, btnWithdraw, btnCheckBalance, btnExit;
    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);
        btnCheckBalance = findViewById(R.id.btnCheckBalance);
        btnExit = findViewById(R.id.btnExit);

        btnDeposit.setOnClickListener(v -> showDepositDialog());
        btnWithdraw.setOnClickListener(v -> showWithdrawDialog());
        btnCheckBalance.setOnClickListener(v ->
            Toast.makeText(this, "Current Balance: ₹" + balance,
Toast.LENGTH_LONG).show()
        );
        btnExit.setOnClickListener(v -> finish());
    }

    private void showDepositDialog() {
        AlertDialog.Builder builder = new AlertDialog.Builder(this);
        builder.setTitle("Deposit Amount");

        final EditText input = new EditText(this);
        input.setHint("Enter amount");
        builder.setView(input);

        builder.setPositiveButton("Deposit", (dialog, which) -> {
            String amountStr = input.getText().toString();
            if (!amountStr.isEmpty()) {
                double amount = Double.parseDouble(amountStr);
```

```
            balance += amount;
            Toast.makeText(this, "Deposited ₹" + amount, Toast.LENGTH_SHORT).show();
        } else {
            Toast.makeText(this, "Enter a valid amount", Toast.LENGTH_SHORT).show();
        }
    });

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

  private void showWithdrawDialog() {
    AlertDialog.Builder builder = new AlertDialog.Builder(this);
    builder.setTitle("Withdraw Amount");

    final EditText input = new EditText(this);
    input.setHint("Enter amount");
    builder.setView(input);

    builder.setPositiveButton("Withdraw", (dialog, which) -> {
      String amountStr = input.getText().toString();
      if (!amountStr.isEmpty()) {
        double amount = Double.parseDouble(amountStr);
        if (amount <= balance) {
          balance -= amount;
          Toast.makeText(this, "Withdrawn ₹" + amount,
Toast.LENGTH_SHORT).show();
        } else {
          Toast.makeText(this, "Insufficient balance", Toast.LENGTH_SHORT).show();
        }
      } else {
        Toast.makeText(this, "Enter a valid amount", Toast.LENGTH_SHORT).show();
      }
    });

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

27) Create an application that allows the user to enter a number in the textbox. Check whether
the number in the textbox is Armstrong 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="20dp">

    <EditText
        android:id="@+id/numberInput"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter a number"
        android:inputType="number" />

    <Button
        android:id="@+id/checkButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Check Armstrong"
        android:layout_marginTop="10dp" />

    <TextView
        android:id="@+id/resultLabel"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text=""
        android:layout_marginTop="20dp"
        android:textSize="18sp" />

</LinearLayout>
```

🧠 **MainActivity.java**

```
package com.example.armstrongchecker;

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

```
public class MainActivity extends AppCompatActivity {

    EditText numberInput;
    Button checkButton;
    TextView resultLabel;

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

        numberInput = findViewById(R.id.numberInput);
        checkButton = findViewById(R.id.checkButton);
        resultLabel = findViewById(R.id.resultLabel);

        checkButton.setOnClickListener(v -> {
            String numStr = numberInput.getText().toString();
            if (!numStr.isEmpty()) {
                int num = Integer.parseInt(numStr);
                if (isArmstrong(num)) {
                    resultLabel.setText(num + " is an Armstrong number");
                } else {
                    resultLabel.setText(num + " is not an Armstrong number");
                }
            } else {
                resultLabel.setText("Please enter a number");
            }
        });
    }

    private boolean isArmstrong(int number) {
        int original = number;
        int sum = 0;
        int digits = String.valueOf(number).length();

        while (number != 0) {
            int digit = number % 10;
            sum += Math.pow(digit, digits);
            number /= 10;
        }
        return sum == original;
    }
}
```

28) Create an application that demonstrate Options Menu in android.

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="20dp">

    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Select an option from the menu"
        android:textSize="18sp" />

</LinearLayout>
```

🧠 **MainActivity.java**

```
package com.example.optionsmenu;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    TextView textView;

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

        textView = findViewById(R.id.textView);
    }

    @Override
```

```
    public boolean onCreateOptionsMenu(Menu menu) {
        MenuInflater inflater = getMenuInflater();
        inflater.inflate(R.menu.main_menu, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        switch (item.getItemId()) {
            case R.id.option1:
                textView.setText("You selected Option 1");
                Toast.makeText(this, "Option 1 clicked", Toast.LENGTH_SHORT).show();
                return true;
            case R.id.option2:
                textView.setText("You selected Option 2");
                Toast.makeText(this, "Option 2 clicked", Toast.LENGTH_SHORT).show();
                return true;
            case R.id.option3:
                textView.setText("You selected Option 3");
                Toast.makeText(this, "Option 3 clicked", Toast.LENGTH_SHORT).show();
                return true;
            default:
                return super.onOptionsItemSelected(item);
        }
    }
}
```

🧩 **res/menu/main_menu.xml**

Create this folder if not present:
app/src/main/res/menu/main_menu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">
    <item
        android:id="@+id/option1"
        android:title="Option 1" />
    <item
        android:id="@+id/option2"
        android:title="Option 2" />
    <item
        android:id="@+id/option3"
```

```
        android:title="Option 3" />
</menu>
```

29) Create the following Vertical Scroll View Creation in Android

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

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical"
        android:padding="16dp">

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="A Scroll View"
            android:textSize="18sp"
            android:layout_marginBottom="10dp" />

        <Button
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Button1" />

        <Button
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Button2" />

        <Button
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Button3" />

        <Button
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Button4" />

        <Button
            android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content"
        android:text="Button5" />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Button6" />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Button7" />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Button8" />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Button9" />
  </LinearLayout>
</ScrollView>
```

30) Create First Activity to accept information like Employee First Name, Middle Name, Last Name, Date of birth, Address, Email ID and display all information on Second Activity when user click on Submit button.

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">

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

  <EditText
```

```
        android:id="@+id/middleName"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Middle Name" />

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

    <EditText
        android:id="@+id/dob"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Date of Birth" />

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

    <EditText
        android:id="@+id/email"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Email ID" />

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

</LinearLayout>
```

🧠 **MainActivity.java**

```
package com.example.employeeinfo;

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

```
import android.os.Bundle;
import android.widget.EditText;
import android.widget.Button;
import android.content.Intent;

public class MainActivity extends AppCompatActivity {

    EditText firstName, middleName, lastName, dob, address, email;
    Button submitBtn;

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

        firstName = findViewById(R.id.firstName);
        middleName = findViewById(R.id.middleName);
        lastName = findViewById(R.id.lastName);
        dob = findViewById(R.id.dob);
        address = findViewById(R.id.address);
        email = findViewById(R.id.email);
        submitBtn = findViewById(R.id.submitBtn);

        submitBtn.setOnClickListener(v -> {
            Intent intent = new Intent(MainActivity.this, DisplayActivity.class);
            intent.putExtra("first", firstName.getText().toString());
            intent.putExtra("middle", middleName.getText().toString());
            intent.putExtra("last", lastName.getText().toString());
            intent.putExtra("dob", dob.getText().toString());
            intent.putExtra("address", address.getText().toString());
            intent.putExtra("email", email.getText().toString());
            startActivity(intent);
        });
    }
}
```

---

activity_display.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">

    <TextView
        android:id="@+id/infoText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:textSize="16sp" />

</LinearLayout>
```

DisplayActivity.java

```
package com.example.employeeinfo;

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

public class DisplayActivity extends AppCompatActivity {

    TextView infoText;

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

        infoText = findViewById(R.id.infoText);

        String data = "First Name: " + getIntent().getStringExtra("first") + "\n"
                + "Middle Name: " + getIntent().getStringExtra("middle") + "\n"
                + "Last Name: " + getIntent().getStringExtra("last") + "\n"
                + "DOB: " + getIntent().getStringExtra("dob") + "\n"
                + "Address: " + getIntent().getStringExtra("address") + "\n"
                + "Email: " + getIntent().getStringExtra("email");

        infoText.setText(data);
    }
}
```

```
<activity android:name=".DisplayActivity" />
```

33) Create application to send an email.

activity_main.xml

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

    <EditText
        android:id="@+id/etTo"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter recipient email" />

    <EditText
        android:id="@+id/etSubject"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter subject"
        android:layout_marginTop="10dp" />

    <EditText
        android:id="@+id/etBody"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter message"
        android:layout_marginTop="10dp"
        android:lines="4"
        android:gravity="top" />

    <Button
        android:id="@+id/btnSend"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Send Email"
        android:layout_marginTop="20dp" />

</LinearLayout>
```

🧩 **MainActivity.java**

```
package com.example.sendemail;

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

public class MainActivity extends AppCompatActivity {

    EditText etTo, etSubject, etBody;
    Button btnSend;

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

        etTo = findViewById(R.id.etTo);
        etSubject = findViewById(R.id.etSubject);
        etBody = findViewById(R.id.etBody);
        btnSend = findViewById(R.id.btnSend);

        btnSend.setOnClickListener(v -> {
            String emailTo = etTo.getText().toString();
            String emailSubject = etSubject.getText().toString();
            String emailBody = etBody.getText().toString();

            if (emailTo.isEmpty()) {
                Toast.makeText(this, "Enter recipient email", Toast.LENGTH_SHORT).show();
                return;
            }

            Intent intent = new Intent(Intent.ACTION_SEND);
            intent.putExtra(Intent.EXTRA_EMAIL, new String[]{emailTo});
            intent.putExtra(Intent.EXTRA_SUBJECT, emailSubject);
            intent.putExtra(Intent.EXTRA_TEXT, emailBody);
            intent.setType("message/rfc822");

            startActivity(Intent.createChooser(intent, "Choose an Email App"));
        });
```

```
    }
}
```

34) Impliment a popup menu triggered by a button click.
Menu options-i)change background color ii) reset screen layout

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/layout"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:gravity="center">

    <Button
        android:id="@+id/btnMenu"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Show Menu" />

</LinearLayout>
```

🧩 **MainActivity.java**

```
package com.example.popupmenuapp;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.LinearLayout;
import android.widget.PopupMenu;
import android.graphics.Color;

public class MainActivity extends AppCompatActivity {

    LinearLayout layout;
    Button btnMenu;

    @Override
```

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

        layout = findViewById(R.id.layout);
        btnMenu = findViewById(R.id.btnMenu);

        btnMenu.setOnClickListener(v -> showPopup(v));
    }

    private void showPopup(View view) {
        PopupMenu popupMenu = new PopupMenu(MainActivity.this, view);
        popupMenu.getMenu().add("Change Background Color");
        popupMenu.getMenu().add("Reset Layout");

        popupMenu.setOnMenuItemClickListener(item -> handleMenu(item));
        popupMenu.show();
    }

    private boolean handleMenu(MenuItem item) {
        String title = item.getTitle().toString();

        if (title.equals("Change Background Color")) {
            layout.setBackgroundColor(Color.YELLOW);
        } else if (title.equals("Reset Layout")) {
            layout.setBackgroundColor(Color.WHITE);
        }
        return true;
    }
}
```

35) Create sample application with login module. Verify Check username and password. On successful login, pass username to next screen and if login fails, prompt the user.

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">

    <EditText
```

```
        android:id="@+id/edtUsername"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Username" />

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

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

</LinearLayout>
```

🧩 **MainActivity.java**

```
package com.example.loginmodule;

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

public class MainActivity extends AppCompatActivity {

    EditText edtUsername, edtPassword;
    Button btnLogin;

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

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

```
        edtPassword = findViewById(R.id.edtPassword);
        btnLogin = findViewById(R.id.btnLogin);

        btnLogin.setOnClickListener(v -> {
            String user = edtUsername.getText().toString();
            String pass = edtPassword.getText().toString();

            if (user.equals("admin") && pass.equals("1234")) {
                Intent i = new Intent(MainActivity.this, WelcomeActivity.class);
                i.putExtra("username", user);
                startActivity(i);
            } else {
                Toast.makeText(MainActivity.this, "Invalid Credentials!",
Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

🧩 activity_welcome.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:gravity="center"
    android:orientation="vertical">

    <TextView
        android:id="@+id/tvWelcome"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Welcome!"
        android:textSize="20sp" />

</LinearLayout>
```

🧩 WelcomeActivity.java

```
package com.example.loginmodule;
```

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

public class WelcomeActivity extends AppCompatActivity {

    TextView tvWelcome;

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

        tvWelcome = findViewById(R.id.tvWelcome);

        String user = getIntent().getStringExtra("username");
        tvWelcome.setText("Welcome, " + user + "!");
    }
}
```

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

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">

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

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

```
        android:layout_height="wrap_content"
        android:hint="Designation" />

    <EditText
        android:id="@+id/edtSalary"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Salary"
        android:inputType="numberDecimal" />

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

    <EditText
        android:id="@+id/edtSearchName"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Employee Name to Search" />

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

    <TextView
        android:id="@+id/tvResult"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text=""
        android:paddingTop="10dp" />

</LinearLayout>
```

🧩 **MainActivity.java**

```
package com.example.employeeapp;

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

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

public class MainActivity extends AppCompatActivity {

    EditText edtName, edtDesg, edtSalary, edtSearchName;
    Button btnAdd, btnSearch;
    TextView tvResult;
    DBHandler dbHandler;

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

        edtName = findViewById(R.id.edtName);
        edtDesg = findViewById(R.id.edtDesg);
        edtSalary = findViewById(R.id.edtSalary);
        edtSearchName = findViewById(R.id.edtSearchName);
        btnAdd = findViewById(R.id.btnAdd);
        btnSearch = findViewById(R.id.btnSearch);
        tvResult = findViewById(R.id.tvResult);

        dbHandler = new DBHandler(this);

        btnAdd.setOnClickListener(v -> {
            String name = edtName.getText().toString();
            String desg = edtDesg.getText().toString();
            String salary = edtSalary.getText().toString();

            if (name.isEmpty() || desg.isEmpty() || salary.isEmpty()) {
                Toast.makeText(this, "Please enter all details", Toast.LENGTH_SHORT).show();
            } else {
                dbHandler.addEmployee(name, desg, salary);
                Toast.makeText(this, "Employee Added", Toast.LENGTH_SHORT).show();
                edtName.setText("");
                edtDesg.setText("");
                edtSalary.setText("");
            }
        });

        btnSearch.setOnClickListener(v -> {
            String name = edtSearchName.getText().toString();
```

```
            String result = dbHandler.getEmployeeByName(name);

            if (result.isEmpty()) {
                tvResult.setText("Employee not found");
            } else {
                tvResult.setText(result);
            }
        });
    }
}
```

🧩 **DBHandler.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 DBHandler extends SQLiteOpenHelper {

    private static final String DB_NAME = "employeeDB";
    private static final int DB_VERSION = 1;
    private static final String TABLE_NAME = "Employee";
    private static final String ID_COL = "emp_id";
    private static final String NAME_COL = "emp_name";
    private static final String DESG_COL = "emp_desg";
    private static final String SALARY_COL = "emp_salary";

    public DBHandler(Context context) {
        super(context, DB_NAME, null, DB_VERSION);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        String query = "CREATE TABLE " + TABLE_NAME + " (" +
                ID_COL + " INTEGER PRIMARY KEY AUTOINCREMENT, " +
                NAME_COL + " TEXT, " +
                DESG_COL + " TEXT, " +
                SALARY_COL + " TEXT)";
```

```
        db.execSQL(query);
    }

    public void addEmployee(String name, String desg, String salary) {
        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues values = new ContentValues();
        values.put(NAME_COL, name);
        values.put(DESG_COL, desg);
        values.put(SALARY_COL, salary);
        db.insert(TABLE_NAME, null, values);
        db.close();
    }

    public String getEmployeeByName(String name) {
        SQLiteDatabase db = this.getReadableDatabase();
        Cursor cursor = db.rawQuery("SELECT * FROM " + TABLE_NAME +
                " WHERE " + NAME_COL + "=?", new String[]{name});

        StringBuilder result = new StringBuilder();

        if (cursor.moveToFirst()) {
            result.append("ID: ").append(cursor.getInt(0))
                    .append("\nName: ").append(cursor.getString(1))
                    .append("\nDesignation: ").append(cursor.getString(2))
                    .append("\nSalary: ").append(cursor.getString(3));
        }

        cursor.close();
        db.close();
        return result.toString();
    }

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

37) Create application to search a specific location on Google Map.

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

```
    android:layout_height="match_parent">

    <EditText
        android:id="@+id/locationEditText"
        android:hint="Enter location"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <Button
        android:id="@+id/searchButton"
        android:text="Search Location"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

</LinearLayout>
```

MainActivity.java

```
package com.example.googlemapsearch;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.content.Intent;
import android.net.Uri;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    EditText locationEditText;
    Button searchButton;

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

        locationEditText = findViewById(R.id.locationEditText);
        searchButton = findViewById(R.id.searchButton);

        searchButton.setOnClickListener(v -> {
            String location = locationEditText.getText().toString().trim();
            if (!location.isEmpty()) {
```

```
            Uri uri = Uri.parse("geo:0,0?q=" + Uri.encode(location));
            Intent intent = new Intent(Intent.ACTION_VIEW, uri);
            intent.setPackage("com.google.android.apps.maps"); // optional
            startActivity(intent);
        } else {
            Toast.makeText(MainActivity.this, "Enter a location",
Toast.LENGTH_SHORT).show();
        }
    });
  }
}
```

38) Create Tables Student (roll_no, name, percentage). Using database perform following operation.
i. Add new record into table.
ii. Display information of students passes with first class

activity_main.xml

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

  <EditText
    android:id="@+id/rollNoEditText"
    android:hint="Enter Roll No"
    android:inputType="number"
    android:layout_width="match_parent"
    android:layout_height="wrap_content" />

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

  <EditText
    android:id="@+id/percentageEditText"
    android:hint="Enter Percentage"
    android:inputType="numberDecimal"
    android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content" />

    <Button
        android:id="@+id/addButton"
        android:text="Add Student"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <Button
        android:id="@+id/showFirstClassButton"
        android:text="Show First Class Students"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

</LinearLayout>
```

🧠 **MainActivity.java**

```
package com.example.studentdb;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import android.app.AlertDialog;

public class MainActivity extends AppCompatActivity {

    EditText rollNoEditText, nameEditText, percentageEditText;
    Button addButton, showFirstClassButton;
    StudentDBHelper dbHelper;

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

        rollNoEditText = findViewById(R.id.rollNoEditText);
        nameEditText = findViewById(R.id.nameEditText);
        percentageEditText = findViewById(R.id.percentageEditText);
        addButton = findViewById(R.id.addButton);
```

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

        dbHelper = new StudentDBHelper(this);

        addButton.setOnClickListener(v -> {
            int roll = Integer.parseInt(rollNoEditText.getText().toString());
            String name = nameEditText.getText().toString();
            float percent = Float.parseFloat(percentageEditText.getText().toString());

            boolean inserted = dbHelper.insertStudent(roll, name, percent);
            if (inserted)
                Toast.makeText(this, "Record Added", Toast.LENGTH_SHORT).show();
            else
                Toast.makeText(this, "Insert Failed", Toast.LENGTH_SHORT).show();
        });

        showFirstClassButton.setOnClickListener(v -> {
            String data = dbHelper.getFirstClassStudents();
            if (data.isEmpty())
                data = "No First Class Students Found";
            showMessage("First Class Students", data);
        });
    }

    void showMessage(String title, String message) {
        new AlertDialog.Builder(this)
                .setTitle(title)
                .setMessage(message)
                .setCancelable(true)
                .show();
    }
}
```

🗄️ **StudentDBHelper.java**

```
package com.example.studentdb;

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

```
public class StudentDBHelper extends SQLiteOpenHelper {

    private static final String DB_NAME = "studentDB";
    private static final int DB_VERSION = 1;
    private static final String TABLE_NAME = "Student";

    public StudentDBHelper(Context context) {
        super(context, DB_NAME, null, DB_VERSION);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        db.execSQL("CREATE TABLE " + TABLE_NAME +
                " (roll_no INTEGER PRIMARY KEY, name TEXT, percentage REAL)");
    }

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

    public boolean insertStudent(int roll, String name, float percent) {
        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues cv = new ContentValues();
        cv.put("roll_no", roll);
        cv.put("name", name);
        cv.put("percentage", percent);
        long result = db.insert(TABLE_NAME, null, cv);
        return result != -1;
    }

    public String getFirstClassStudents() {
        SQLiteDatabase db = this.getReadableDatabase();
        Cursor cursor = db.rawQuery("SELECT * FROM " + TABLE_NAME + " WHERE
percentage >= 60", null);
        StringBuilder sb = new StringBuilder();

        while (cursor.moveToNext()) {
            sb.append("Roll No: ").append(cursor.getInt(0))
              .append("\nName: ").append(cursor.getString(1))
              .append("\nPercentage: ").append(cursor.getFloat(2))
              .append("\n\n");
```

```
        }
        cursor.close();
        return sb.toString();
    }
}
```

39) Create application to send and receive messages using SMS Manager.

activity_main.xml

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

    <EditText
        android:id="@+id/editTextNumber"
        android:hint="Enter phone number"
        android:inputType="phone"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>

    <EditText
        android:id="@+id/editTextMessage"
        android:hint="Enter message"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>

    <Button
        android:id="@+id/buttonSend"
        android:text="Send SMS"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>

    <TextView
        android:id="@+id/textViewReceived"
        android:text="Received Message will appear here"
        android:layout_marginTop="16dp"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>

</LinearLayout>
```

🧠 **MainActivity.java**

```
package com.example.smsdemo;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import android.content.IntentFilter;
import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {

    EditText editTextNumber, editTextMessage;
    Button buttonSend;
    TextView textViewReceived;
    SmsReceiver smsReceiver;

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

        editTextNumber = findViewById(R.id.editTextNumber);
        editTextMessage = findViewById(R.id.editTextMessage);
        buttonSend = findViewById(R.id.buttonSend);
        textViewReceived = findViewById(R.id.textViewReceived);

        // Send SMS
        buttonSend.setOnClickListener(v -> {
            String phone = editTextNumber.getText().toString();
            String message = editTextMessage.getText().toString();

            try {
                SmsManager smsManager = SmsManager.getDefault();
                smsManager.sendTextMessage(phone, null, message, null, null);
                Toast.makeText(this, "SMS Sent", Toast.LENGTH_SHORT).show();
```

```
            } catch (Exception e) {
                Toast.makeText(this, "Failed: " + e.getMessage(), Toast.LENGTH_LONG).show();
            }
        });

        // Register SMS Receiver dynamically
        smsReceiver = new SmsReceiver();
        IntentFilter filter = new IntentFilter("android.provider.Telephony.SMS_RECEIVED");
        registerReceiver(smsReceiver, filter);
    }

    @Override
    protected void onDestroy() {
        super.onDestroy();
        unregisterReceiver(smsReceiver);
    }

    // Inner class to receive SMS
    public class SmsReceiver extends BroadcastReceiver {
        @Override
        public void onReceive(Context context, Intent intent) {
            Object[] pdus = (Object[]) intent.getExtras().get("pdus");
            if (pdus != null) {
                StringBuilder msg = new StringBuilder();
                for (Object pdu : pdus) {
                    android.telephony.SmsMessage smsMessage =
                            android.telephony.SmsMessage.createFromPdu((byte[]) pdu);
                    msg.append("From: ").append(smsMessage.getDisplayOriginatingAddress())
                       .append("\nMessage: ").append(smsMessage.getMessageBody());
                }
                textViewReceived.setText(msg.toString());
            }
        }
    }
}
```

⚙️ **AndroidManifest.xml (Only if not already done)**

```
<!-- Add these permissions at the top, outside <application> -->
<uses-permission android:name="android.permission.SEND_SMS"/>
```

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

<!-- Inside your <application> tag, add this receiver -->
<receiver android:name=".MainActivity$SmsReceiver">
    <intent-filter>
        <action android:name="android.provider.Telephony.SMS_RECEIVED"/>
    </intent-filter>
</receiver>
```

41) Create a Simple Application, which reads a positive number from the user and display its square in another activity.

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">

    <EditText
        android:id="@+id/editTextNumber"
        android:hint="Enter a positive number"
        android:inputType="number"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>

    <Button
        android:id="@+id/buttonSquare"
        android:text="Find Square"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="16dp"/>

</LinearLayout>
```

🧠 **MainActivity.java**

```
package com.example.squaredemo;

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

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

public class MainActivity extends AppCompatActivity {

    EditText editTextNumber;
    Button buttonSquare;

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

        editTextNumber = findViewById(R.id.editTextNumber);
        buttonSquare = findViewById(R.id.buttonSquare);

        buttonSquare.setOnClickListener(v -> {
            String numStr = editTextNumber.getText().toString();

            if (numStr.isEmpty()) {
                Toast.makeText(this, "Please enter a number", Toast.LENGTH_SHORT).show();
                return;
            }

            int num = Integer.parseInt(numStr);
            if (num < 0) {
                Toast.makeText(this, "Enter a positive number", Toast.LENGTH_SHORT).show();
                return;
            }

            int square = num * num;

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

🧩 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:padding="16dp">

    <TextView
        android:id="@+id/textViewResult"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:textSize="20sp"/>

</LinearLayout>
```

🧠 ResultActivity.java

```
package com.example.squaredemo;

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

public class ResultActivity extends AppCompatActivity {

    TextView textViewResult;

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

        textViewResult = findViewById(R.id.textViewResult);

        int square = getIntent().getIntExtra("square", 0);
        textViewResult.setText("Square: " + square);
    }
}
```

⚙️ **AndroidManifest.xml (only what to add)**

Add this inside your <application> tag:

<activity android:name=".ResultActivity"/>

42) Create a simple android application to demonstrate datepicker.

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">

    <Button
        android:id="@+id/buttonSelectDate"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Select Date" />

    <TextView
        android:id="@+id/textViewDate"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Selected Date will appear here"
        android:layout_marginTop="16dp"
        android:textSize="18sp"/>
</LinearLayout>
```

🧠 **MainActivity.java**

```
package com.example.datepickerdemo;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.app.DatePickerDialog;
import android.widget.Button;
import android.widget.TextView;
import android.widget.DatePicker;
import java.util.Calendar;
```

```
public class MainActivity extends AppCompatActivity {

    Button buttonSelectDate;
    TextView textViewDate;

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

        buttonSelectDate = findViewById(R.id.buttonSelectDate);
        textViewDate = findViewById(R.id.textViewDate);

        buttonSelectDate.setOnClickListener(v -> {
            final Calendar calendar = Calendar.getInstance();
            int year = calendar.get(Calendar.YEAR);
            int month = calendar.get(Calendar.MONTH);
            int day = calendar.get(Calendar.DAY_OF_MONTH);

            DatePickerDialog datePickerDialog = new DatePickerDialog(
                    MainActivity.this,
                    (view, selectedYear, selectedMonth, selectedDay) -> {
                        String date = selectedDay + "/" + (selectedMonth + 1) + "/" + selectedYear;
                        textViewDate.setText("Selected Date: " + date);
                    },
                    year, month, day
            );
            datePickerDialog.show();
        });
    }
}
```

44) Create an Android application to perform following operations on table Student (Sid, Sname ,phno). Use autoincrement for Sid and Perform following Operations.
i) Add Student and display its information.
ii) Delete Student

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">

    <EditText
        android:id="@+id/editName"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Student Name" />

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

    <Button
        android:id="@+id/buttonAdd"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Add Student" />

    <EditText
        android:id="@+id/editId"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Student ID to Delete"
        android:inputType="number" />

    <Button
        android:id="@+id/buttonDelete"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Delete Student" />

    <ListView
        android:id="@+id/listView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

</LinearLayout>
```

🧠 **MainActivity.java**

```
package com.example.studentdb;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.*;
import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {

    EditText editName, editPhone, editId;
    Button buttonAdd, buttonDelete;
    ListView listView;
    DBHandler dbHandler;

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

        editName = findViewById(R.id.editName);
        editPhone = findViewById(R.id.editPhone);
        editId = findViewById(R.id.editId);
        buttonAdd = findViewById(R.id.buttonAdd);
        buttonDelete = findViewById(R.id.buttonDelete);
        listView = findViewById(R.id.listView);
        dbHandler = new DBHandler(this);

        buttonAdd.setOnClickListener(v -> {
            String name = editName.getText().toString();
            String phone = editPhone.getText().toString();

            if (name.isEmpty() || phone.isEmpty()) {
                Toast.makeText(this, "Enter all fields", Toast.LENGTH_SHORT).show();
            } else {
                dbHandler.addStudent(name, phone);
                Toast.makeText(this, "Student Added", Toast.LENGTH_SHORT).show();
                editName.setText("");
                editPhone.setText("");
                showStudents();
            }
        });

        buttonDelete.setOnClickListener(v -> {
            String idText = editId.getText().toString();
```

```
            if (idText.isEmpty()) {
                Toast.makeText(this, "Enter Student ID", Toast.LENGTH_SHORT).show();
            } else {
                int id = Integer.parseInt(idText);
                dbHandler.deleteStudent(id);
                Toast.makeText(this, "Student Deleted", Toast.LENGTH_SHORT).show();
                editId.setText("");
                showStudents();
            }
        });

        showStudents();
    }

    private void showStudents() {
        ArrayList<String> list = dbHandler.getAllStudents();
        ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
android.R.layout.simple_list_item_1, list);
        listView.setAdapter(adapter);
    }
}
```

🧩 **DBHandler.java**

```
package com.example.studentdb;

import android.content.*;
import android.database.Cursor;
import android.database.sqlite.*;
import java.util.ArrayList;

public class DBHandler extends SQLiteOpenHelper {

    private static final String DB_NAME = "studentdb";
    private static final int DB_VERSION = 1;
    private static final String TABLE_NAME = "student";
    private static final String ID_COL = "Sid";
    private static final String NAME_COL = "Sname";
    private static final String PHONE_COL = "phno";

    public DBHandler(Context context) {
        super(context, DB_NAME, null, DB_VERSION);
```

```
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        String query = "CREATE TABLE " + TABLE_NAME + " (" +
                ID_COL + " INTEGER PRIMARY KEY AUTOINCREMENT, " +
                NAME_COL + " TEXT, " +
                PHONE_COL + " TEXT)";
        db.execSQL(query);
    }

    public void addStudent(String name, String phone) {
        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues values = new ContentValues();
        values.put(NAME_COL, name);
        values.put(PHONE_COL, phone);
        db.insert(TABLE_NAME, null, values);
        db.close();
    }

    public ArrayList<String> getAllStudents() {
        ArrayList<String> list = new ArrayList<>();
        SQLiteDatabase db = this.getReadableDatabase();
        Cursor cursor = db.rawQuery("SELECT * FROM " + TABLE_NAME, null);
        while (cursor.moveToNext()) {
            list.add("ID: " + cursor.getInt(0) + " | Name: " + cursor.getString(1) + " | Phone: " +
cursor.getString(2));
        }
        cursor.close();
        return list;
    }

    public void deleteStudent(int id) {
        SQLiteDatabase db = this.getWritableDatabase();
        db.delete(TABLE_NAME, ID_COL + "=?", new String[]{String.valueOf(id)});
        db.close();
    }

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

45) Create an Android Application that Demonstrate Radio Button.

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:gravity="center"
    android:orientation="vertical"
    android:padding="20dp">

    <RadioGroup
        android:id="@+id/radioGroup"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content">

        <RadioButton
            android:id="@+id/radioMale"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Male" />

        <RadioButton
            android:id="@+id/radioFemale"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Female" />

        <RadioButton
            android:id="@+id/radioOther"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Other" />
    </RadioGroup>

    <Button
        android:id="@+id/btnShow"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Show Selection"
        android:layout_marginTop="20dp" />

    <TextView
```

```
    android:id="@+id/tvResult"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text=""
    android:textSize="18sp"
    android:layout_marginTop="15dp"/>
</LinearLayout>
```

MainActivity.java

```
package com.example.radiobuttonexample;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.*;
import android.view.View;

public class MainActivity extends AppCompatActivity {
   RadioGroup radioGroup;
   Button btnShow;
   TextView tvResult;

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

      radioGroup = findViewById(R.id.radioGroup);
      btnShow = findViewById(R.id.btnShow);
      tvResult = findViewById(R.id.tvResult);

      btnShow.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            int selectedId = radioGroup.getCheckedRadioButtonId();

            if (selectedId == -1) {
               Toast.makeText(MainActivity.this, "Please select an option",
Toast.LENGTH_SHORT).show();
            } else {
               RadioButton selectedRadioButton = findViewById(selectedId);
               String selectedText = selectedRadioButton.getText().toString();
               tvResult.setText("Selected: " + selectedText);
```

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

46) Write a program to find the specific location of an Android device and display details of the place like Address line, city with Geocoding.

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="20dp">

   <Button
      android:id="@+id/btnGetLocation"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Get Current Location" />

   <TextView
      android:id="@+id/tvLocation"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:textSize="18sp"
      android:paddingTop="20dp"
      android:text="" />
</LinearLayout>
```

MainActivity.java

```
package com.example.locationapp;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
```

```
import android.content.pm.PackageManager;
import android.location.Address;
import android.location.Geocoder;
import android.location.Location;
import android.os.Bundle;
import android.widget.*;
import android.view.View;
import android.location.LocationManager;
import android.location.LocationListener;
import android.content.Context;

import java.io.IOException;
import java.util.List;
import java.util.Locale;

public class MainActivity extends AppCompatActivity {

    Button btnGetLocation;
    TextView tvLocation;
    LocationManager locationManager;
    private static final int LOCATION_PERMISSION_CODE = 100;

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

        btnGetLocation = findViewById(R.id.btnGetLocation);
        tvLocation = findViewById(R.id.tvLocation);

        btnGetLocation.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                getLocation();
            }
        });
    }

    private void getLocation() {
        locationManager = (LocationManager)
getSystemService(Context.LOCATION_SERVICE);

        if (ContextCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION)
```

```
            != PackageManager.PERMISSION_GRANTED) {

        ActivityCompat.requestPermissions(this,
            new String[]{Manifest.permission.ACCESS_FINE_LOCATION},
LOCATION_PERMISSION_CODE);
    } else {
        locationManager.requestLocationUpdates(LocationManager.GPS_PROVIDER, 0, 0,
new LocationListener() {
            @Override
            public void onLocationChanged(@NonNull Location location) {
                double latitude = location.getLatitude();
                double longitude = location.getLongitude();

                Geocoder geocoder = new Geocoder(MainActivity.this, Locale.getDefault());
                try {
                    List<Address> addresses = geocoder.getFromLocation(latitude, longitude, 1);
                    if (addresses != null && !addresses.isEmpty()) {
                        Address address = addresses.get(0);
                        String addressLine = address.getAddressLine(0);
                        String city = address.getLocality();
                        String country = address.getCountryName();

                        tvLocation.setText("Latitude: " + latitude +
                                "\nLongitude: " + longitude +
                                "\nAddress: " + addressLine +
                                "\nCity: " + city +
                                "\nCountry: " + country);
                    } else {
                        tvLocation.setText("Unable to fetch address.");
                    }
                } catch (IOException e) {
                    e.printStackTrace();
                    tvLocation.setText("Error: " + e.getMessage());
                }

                locationManager.removeUpdates(this);
            }
        });
    }
}

@Override
public void onRequestPermissionsResult(int requestCode, @NonNull String[] permissions,
@NonNull int[] grantResults) {
```

```
        super.onRequestPermissionsResult(requestCode, permissions, grantResults);
        if (requestCode == LOCATION_PERMISSION_CODE && grantResults.length > 0
&& grantResults[0] == PackageManager.PERMISSION_GRANTED) {
            getLocation();
        } else {
            Toast.makeText(this, "Permission Denied", Toast.LENGTH_SHORT).show();
        }
    }
}
```

🗒️ **AndroidManifest.xml (only changes)**

```
<!-- Add these permissions at the top (outside <application>) -->
<uses-permission android:name="android.permission.ACCESS_FINE_LOCATION"/>
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION"/>
```

47) Create an Android Application that Demonstrate Switch and Toggle Button.

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="20dp">

    <Switch
        android:id="@+id/simpleSwitch"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Switch" />

    <ToggleButton
        android:id="@+id/simpleToggle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textOn="Toggle ON"
        android:textOff="Toggle OFF"
        android:layout_marginTop="20dp" />

    <TextView
        android:id="@+id/statusText"
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Status will appear here"
    android:layout_marginTop="20dp"
    android:textSize="18sp" />
</LinearLayout>
```

MainActivity.java

```
package com.example.switchtoggleapp;

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

public class MainActivity extends AppCompatActivity {

   Switch simpleSwitch;
   ToggleButton simpleToggle;
   TextView statusText;

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

      simpleSwitch = findViewById(R.id.simpleSwitch);
      simpleToggle = findViewById(R.id.simpleToggle);
      statusText = findViewById(R.id.statusText);

      // Switch listener
      simpleSwitch.setOnCheckedChangeListener((buttonView, isChecked) -> {
         if (isChecked) {
            statusText.setText("Switch is ON");
         } else {
            statusText.setText("Switch is OFF");
         }
      });

      // Toggle Button listener
      simpleToggle.setOnCheckedChangeListener((buttonView, isChecked) -> {
         if (isChecked) {
            statusText.setText("Toggle Button is ON");
```

```
        } else {
            statusText.setText("Toggle Button is OFF");
        }
    });
  }
}
```

49) Create a application to make a phone call using services.

MainActivity.java

```
package com.example.callapp;

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

public class MainActivity extends AppCompatActivity {

  EditText mno;
  Button call;

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

    mno = findViewById(R.id.mno);
    call = findViewById(R.id.call);

    call.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View v) {
        Intent ph_intent = new Intent(Intent.ACTION_CALL);
        String ph_no = mno.getText().toString();
        ph_intent.setData(Uri.parse("tel:" + ph_no));
        startActivity(ph_intent);
      }
    });
  }
}
```

---

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="20dp">

    <EditText
        android:id="@+id/mno"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter phone number"
        android:inputType="phone" />

    <Button
        android:id="@+id/call"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Call"
        android:layout_marginTop="20dp" />
</LinearLayout>
```

🧩 **AndroidManifest.xml (only required lines)**

Add these outside <application>:

```
<uses-permission android:name="android.permission.CALL_PHONE" />
<uses-feature android:name="android.hardware.telephony" android:required="true" />
```

50) Create an application to demonstrate time picker.

MainActivity.java

```
package com.example.timepickerapp;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.app.TimePickerDialog;
import android.view.View;
```

```
import android.widget.Button;
import android.widget.TextView;
import android.widget.TimePicker;
import java.util.Calendar;

public class MainActivity extends AppCompatActivity {

    Button btnSelectTime;
    TextView txtTime;

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

        btnSelectTime = findViewById(R.id.btnSelectTime);
        txtTime = findViewById(R.id.txtTime);

        btnSelectTime.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {

                Calendar c = Calendar.getInstance();
                int hour = c.get(Calendar.HOUR_OF_DAY);
                int minute = c.get(Calendar.MINUTE);

                TimePickerDialog timePickerDialog = new TimePickerDialog(
                        MainActivity.this,
                        new TimePickerDialog.OnTimeSetListener() {
                            @Override
                            public void onTimeSet(TimePicker view, int hourOfDay, int minute) {
                                txtTime.setText("Selected Time: " + hourOfDay + ":" + minute);
                            }
                        }, hour, minute, true);
                timePickerDialog.show();
            }
        });
    }
}
```

🧩 **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="20dp">

    <Button
        android:id="@+id/btnSelectTime"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Select Time" />

    <TextView
        android:id="@+id/txtTime"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"
        android:text="Selected Time:" />
</LinearLayout>
```

51) Create an application to demonstrate spinner in android.

MainActivity.java

```
package com.example.spinnerdemo;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.Spinner;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    Spinner spinner;

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

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

        String[] languages = {"Select Language", "Java", "Python", "C++", "Kotlin", "Dart"};

        ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
android.R.layout.simple_spinner_item, languages);
        adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);

        spinner.setAdapter(adapter);

        spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
            @Override
            public void onItemSelected(AdapterView<?> parent, View view, int position, long id)
{
                if (position > 0) {
                    String selected = parent.getItemAtPosition(position).toString();
                    Toast.makeText(MainActivity.this, "Selected: " + selected,
Toast.LENGTH_SHORT).show();
                }
            }

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

🧩 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="20dp">

    <Spinner
        android:id="@+id/spinner"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />
</LinearLayout>
```

52) Create an application to demonstrate working thread using runnable.

MainActivity.java

```
package com.example.threadexample;

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

public class MainActivity extends AppCompatActivity {

   Button bt;

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

      bt = findViewById(R.id.bt);

      bt.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            Runnable objrun = new Runnable() {
               @Override
               public void run() {
                  try {
                     // Simulate a long-running operation (5 seconds)
                     Thread.sleep(5000);

                     // Update UI safely using runOnUiThread
                     runOnUiThread(new Runnable() {
                        @Override
                        public void run() {
                           Toast.makeText(getApplicationContext(), "Download complete",
Toast.LENGTH_SHORT).show();
                        }
                     });
                  } catch (InterruptedException e) {
                     e.printStackTrace();
```

```
                }
            }
        };

        // Create and start the thread
        Thread objthread = new Thread(objrun);
        objthread.start();
    }
  });
 }
}
```

---

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="20dp">

   <Button
      android:id="@+id/bt"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Start Thread" />
</LinearLayout>
```