Practical-7

Implementation of SQLite Database

1. **creating a new application to Complete CRUD operation in application for name, designation and location.**

1)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">

  <EditText
    android:id="@+id/txtID"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter ID"
    android:ems="10"/>
  <TextView
    android:id="@+id/fstTxt"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Name" />

  <EditText
    android:id="@+id/txtName"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:ems="10"/>

  <TextView
    android:id="@+id/secTxt"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Designation" />

  <EditText
    android:id="@+id/txtDesignation"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:ems="10" />

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

```
    android:text="Location" />

  <EditText
    android:id="@+id/txtLocation"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:ems="10" />

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

  <Button
    android:id="@+id/btnUpdate"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Update" />

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

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

</LinearLayout>
```

2)Details.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">

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

```
    <Button
        android:id="@+id/btnBack"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_marginTop="20dp"
   android:text="Back" />
</LinearLayout>
```

3)list_row.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:padding="5dip">

    <TextView
        android:id="@+id/id"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textStyle="bold"
        android:textSize="17sp"
        android:layout_alignParentStart="true"
        android:layout_alignParentTop="true"
        android:layout_marginEnd="16dp"
        android:layout_marginTop="16dp"
        android:text="ID"/>

    <TextView
        android:id="@+id/name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textStyle="bold"
        android:textSize="17sp"
        android:layout_below="@+id/id"
        android:layout_alignParentStart="true"
        android:text="Name"/>

    <TextView
        android:id="@+id/designation"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="14sp"
        android:layout_below="@+id/name"
```

```
    android:layout_alignParentStart="true"
    android:layout_marginTop="7dp"
    android:text="Designation"/>

  <TextView
    android:id="@+id/location"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textSize="14sp"
    android:layout_below="@+id/designation"
    android:layout_alignParentStart="true"
    android:layout_marginTop="7dp"
    android:text="Location"/>

</RelativeLayout>
```

4) DbHandler.java

```
package com.example.apk1;
import android.annotation.SuppressLint;
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;
import java.util.HashMap;
public class DbHandler extends SQLiteOpenHelper {
  private static final int DB_VERSION = 1;
  private static final String DB_NAME = "usersdb";
  private static final String TABLE_Users = "userdetails";
  private static final String KEY_ID = "id";
  private static final String KEY_NAME = "name";
  private static final String KEY_DESIGNATION = "designation";
  private static final String KEY_LOCATION = "location";

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

  @Override
  public void onCreate(SQLiteDatabase db) {
    String CREATE_TABLE = "CREATE TABLE " + TABLE_Users + "("
        + KEY_ID + " INTEGER PRIMARY KEY AUTOINCREMENT,"
        + KEY_NAME + " TEXT,"
        + KEY_DESIGNATION + " TEXT,"
        + KEY_LOCATION + " TEXT"
        + ")";
    db.execSQL(CREATE_TABLE);
```

```
}

@Override
public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
   // Drop older table if exists
   db.execSQL("DROP TABLE IF EXISTS " + TABLE_Users);
   // Create tables again
   onCreate(db);
}

// Insert a new user
public long insertUserDetails(String name, String designation, String location) {
   SQLiteDatabase db = this.getWritableDatabase();
   ContentValues cValues = new ContentValues();
   cValues.put(KEY_NAME, name);
   cValues.put(KEY_DESIGNATION, designation);
   cValues.put(KEY_LOCATION, location);
   long newRowId = db.insert(TABLE_Users, null, cValues);
   db.close();
   return newRowId;
}

// Update user details
public int updateUserDetails(int id, String name, String designation, String location) {
   SQLiteDatabase db = this.getWritableDatabase();
   ContentValues cVals = new ContentValues();
   cVals.put(KEY_NAME, name);
   cVals.put(KEY_DESIGNATION, designation);
   cVals.put(KEY_LOCATION, location);
   return db.update(TABLE_Users, cVals, KEY_ID + " = ?", new String[]{String.valueOf(id)});
}

// Delete a user by ID
public void deleteUser(int id) {
   SQLiteDatabase db = this.getWritableDatabase();
   db.delete(TABLE_Users, KEY_ID + " = ?", new String[]{String.valueOf(id)});
   db.close();
}

// Get all users
@SuppressLint("Range")
public ArrayList<HashMap<String, String>> getAllUsers() {
   SQLiteDatabase db = this.getWritableDatabase();
   ArrayList<HashMap<String, String>> userList = new ArrayList<>();
   String query = "SELECT * FROM " + TABLE_Users;
   Cursor cursor = db.rawQuery(query, null);
   while (cursor.moveToNext()) {
      HashMap<String, String> user = new HashMap<>();
```

```
            user.put("id", cursor.getString(cursor.getColumnIndex(KEY_ID)));
            user.put("name", cursor.getString(cursor.getColumnIndex(KEY_NAME)));
            user.put("designation", cursor.getString(cursor.getColumnIndex(KEY_DESIGNATION)));
            user.put("location", cursor.getString(cursor.getColumnIndex(KEY_LOCATION)));
            userList.add(user);
        }
        cursor.close();
        return userList;
    }

    // Get a user by ID
    @SuppressLint("Range")
    public HashMap<String, String> getUserById(int id) {
        SQLiteDatabase db = this.getWritableDatabase();
        HashMap<String, String> user = new HashMap<>();
        String query = "SELECT * FROM " + TABLE_Users + " WHERE " + KEY_ID + " = ?";
        Cursor cursor = db.rawQuery(query, new String[]{String.valueOf(id)});
        if (cursor.moveToNext()) {
            user.put("id", cursor.getString(cursor.getColumnIndex(KEY_ID)));
            user.put("name", cursor.getString(cursor.getColumnIndex(KEY_NAME)));
            user.put("designation", cursor.getString(cursor.getColumnIndex(KEY_DESIGNATION)));
            user.put("location", cursor.getString(cursor.getColumnIndex(KEY_LOCATION)));
        }
        cursor.close();
        return user;
    }
}
```

5) MainActivity.java

```
package com.example.apk1;
package com.example.apk1;

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

public class MainActivity extends AppCompatActivity {
    EditText id, name, designation, location;
    Button saveBtn, addBtn, updateBtn, deleteBtn, displayBtn;
    Intent intent;

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

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

        // Initialize EditText for entering the ID
        id = findViewById(R.id.txtID);

        name = findViewById(R.id.txtName);
        designation = findViewById(R.id.txtDesignation);
        location = findViewById(R.id.txtLocation);
        addBtn = findViewById(R.id.btnAdd);
        updateBtn = findViewById(R.id.btnUpdate);
        deleteBtn = findViewById(R.id.btnDelete);
        displayBtn = findViewById(R.id.btnDisplay);

        // Click listener for the "Add" button
        addBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String name1 = name.getText().toString();
                String designation1 = designation.getText().toString();
                String location1 = location.getText().toString();

                DbHandler dbHandler = new DbHandler(MainActivity.this);
                long newRowId = dbHandler.insertUserDetails(name1, designation1, location1);

                if (newRowId != -1) {
                    // Insertion successful
                    Toast.makeText(getApplicationContext(), "Details Added Successfully",
Toast.LENGTH_SHORT).show();
                    // Optionally, you can clear the input fields here
                    name.setText("");
                    designation.setText("");
                    location.setText("");
                } else {
                    // Insertion failed
                    Toast.makeText(getApplicationContext(), "Failed to add details",
Toast.LENGTH_SHORT).show();
                }
            }
        });

        // Click listener for the "Update" button
        updateBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String idStr = id.getText().toString();
                if (!idStr.isEmpty()) {
                    int userId = Integer.parseInt(idStr);
                    String name1 = name.getText().toString();
```

```
            String designation1 = designation.getText().toString();
            String location1 = location.getText().toString();

            DbHandler dbHandler = new DbHandler(MainActivity.this);
            int rowsUpdated = dbHandler.updateUserDetails(userId, name1, designation1,
location1);

            if (rowsUpdated > 0) {
              Toast.makeText(getApplicationContext(), "Details Updated Successfully",
Toast.LENGTH_SHORT).show();
              // Optionally, you can clear the input fields here
              id.setText("");
              name.setText("");
              designation.setText("");
              location.setText("");
            } else {
              Toast.makeText(getApplicationContext(), "No user with this ID found",
Toast.LENGTH_SHORT).show();
            }
          } else {
            Toast.makeText(getApplicationContext(), "Please enter an ID to update",
Toast.LENGTH_SHORT).show();
          }
        }
      });

      // Click listener for the "Delete" button
      deleteBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
          String idStr = id.getText().toString();
          if (!idStr.isEmpty()) {
            int userId = Integer.parseInt(idStr);

            DbHandler dbHandler = new DbHandler(MainActivity.this);
            dbHandler.deleteUser(userId);

            // Optionally, you can clear the input fields here
            id.setText("");
            name.setText("");
            designation.setText("");
            location.setText("");

            Toast.makeText(getApplicationContext(),"User_Deleted_Successfully",
            Toast.LENGTH_SHORT).show();
          } else {
            Toast.makeText(getApplicationContext(), "Please enter an ID to delete",
Toast.LENGTH_SHORT).show();
```

```
            }
        }
    });

    // Click listener for the "Display" button
    displayBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            intent = new Intent(MainActivity.this, DetailsActivity.class);
            startActivity(intent);
        }
    });
  }
}
```

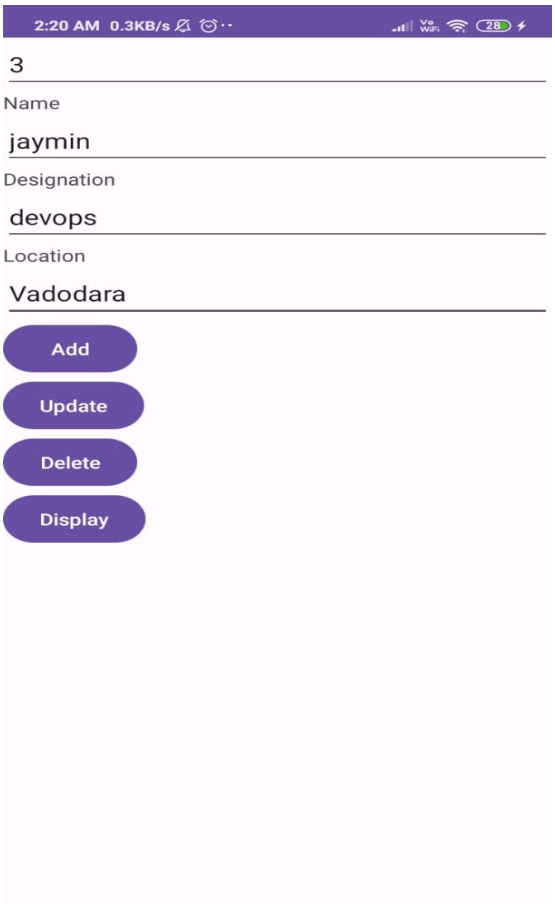
6) DetailsActivity.java

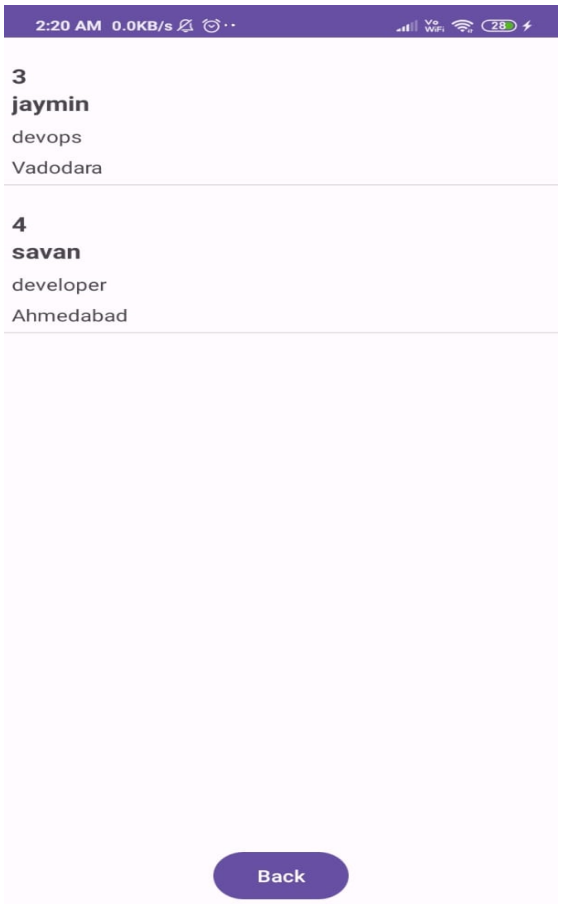
```
package com.example.apk1;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.ListAdapter;
import android.widget.ListView;
import android.widget.SimpleAdapter;
import androidx.appcompat.app.AppCompatActivity;
import java.util.ArrayList;
import java.util.HashMap;
public class DetailsActivity extends AppCompatActivity {
  Intent intent;

  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.details);
    DbHandler db = new DbHandler(this);
    ArrayList<HashMap<String, String>> userList = db.GetUsers();
    ListView lv = findViewById(R.id.user_list);
    ListAdapter adapter = new SimpleAdapter(
        DetailsActivity.this,
        userList,
        R.layout.list_row,
        new String[]{"id", "name", "designation", "location"},
        new int[]{R.id.id, R.id.name, R.id.designation, R.id.location}
    );
    lv.setAdapter(adapter);
    Button back = findViewById(R.id.btnBack);
    back.setOnClickListener(new View.OnClickListener() {
      @Override
```

```
        public void onClick(View v) {
          intent = new Intent(DetailsActivity.this, MainActivity.class);
          startActivity(intent);
        }
      });
    }
}
```

OUTPUT:





Q-2) Create an application which will handle Student Details.

- **Create a database with name "MyDb"**
- **Create a student table with id, rollno, name and marks.**
- **Create a screen to allow user to input student details, and store the details to table. Display error message if data is empty.**
- **Display all students entered.**
- **Allow the user to edit or remove the student.**

Practical-7

1) 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">
   <EditText
      android:id="@+id/txtRollNo"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Roll Number" />
   <EditText
      android:id="@+id/txtName"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Name" />

   <EditText
      android:id="@+id/txtCMarks"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="C Marks" />
   <EditText
      android:id="@+id/txtJavaMarks"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Java Marks" />
   <EditText
      android:id="@+id/txtPythonMarks"
      android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content"
        android:hint="Python Marks" />
    <Button
        android:id="@+id/btnAdd"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Add" />
    <Button
        android:id="@+id/btnUpdate"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Update" />
    <Button
        android:id="@+id/btnDelete"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Delete" />
    <Button
        android:id="@+id/btnDisplay"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Display" />
</LinearLayout>
```

2) details.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">
    <ListView
```

```
        android:id="@+id/studentListView"
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"
        android:dividerHeight="1dp" />
    <Button
        android:id="@+id/btnBack"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Back" />
</LinearLayout>
```

3) list_row.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="wrap_content"
    android:orientation="vertical"
    android:padding="5dip" >
    <TextView
        android:id="@+id/rollNo"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textStyle="bold"
        android:textSize="17dp" />
    <TextView
        android:id="@+id/name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textStyle="bold"
```

```
        android:textSize="17dp" />
    <TextView
        android:id="@+id/cMarks"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="7dp"
        android:textColor="#343434"
        android:textSize="14dp" />
    <TextView
        android:id="@+id/javaMarks"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textColor="#343434"
        android:textSize="14dp" />
    <TextView
        android:id="@+id/pythonMarks"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textColor="#343434"
        android:textSize="14dp" />
</LinearLayout>
```

4)Datahandler.java:

```
package com.example.apk1;
import android.annotation.SuppressLint;
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;
import java.util.HashMap;
public class DbHandler extends SQLiteOpenHelper {
   private static final int DB_VERSION = 1;
   private static final String DB_NAME = "studentdb";
   private static final String TABLE_Students = "studentdetails";
   private static final String KEY_ID = "id";
   private static final String KEY_ROLLNO = "rollno";
   private static final String KEY_NAME = "name";
   private static final String KEY_CMarks = "c_marks";
   private static final String KEY_JavaMarks = "java_marks";
   private static final String KEY_PythonMarks = "python_marks";

   public DbHandler(Context context) {
      super(context, DB_NAME, null, DB_VERSION);
   }
   @Override
   public void onCreate(SQLiteDatabase db) {
      String CREATE_TABLE = "CREATE TABLE " + TABLE_Students + "("
            + KEY_ID + " INTEGER PRIMARY KEY AUTOINCREMENT,"
            + KEY_ROLLNO + " TEXT,"
            + KEY_NAME + " TEXT,"
            + KEY_CMarks + " INTEGER,"
            + KEY_JavaMarks + " INTEGER,"
            + KEY_PythonMarks + " INTEGER"
            + ")";
      db.execSQL(CREATE_TABLE);
   }
   @Override
   public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
```

```
        // Drop older table if exists
        db.execSQL("DROP TABLE IF EXISTS " + TABLE_Students);
        // Create tables again
        onCreate(db);
    }
    // Adding new Student Details
    void insertStudentDetails(String rollNo, String name, int cMarks, int javaMarks, int pythonMarks) {
        // Get the Data Repository in write mode
        SQLiteDatabase db = this.getWritableDatabase();
        // Create a new map of values, where column names are the keys
        ContentValues cValues = new ContentValues();
        cValues.put(KEY_ROLLNO, rollNo);
        cValues.put(KEY_NAME, name);
        cValues.put(KEY_CMarks, cMarks);
        cValues.put(KEY_JavaMarks, javaMarks);
        cValues.put(KEY_PythonMarks, pythonMarks);
        // Insert the new row, returning the primary key value of the new row
        long newRowId = db.insert(TABLE_Students, null, cValues);
        db.close();
    }
    @SuppressLint("Range")
    public ArrayList<HashMap<String, String>> GetStudents() {
        SQLiteDatabase db = this.getWritableDatabase();
        ArrayList<HashMap<String, String>> studentList = new ArrayList<>();
        String query = "SELECT rollno, name, c_marks, java_marks, python_marks, id FROM " +
TABLE_Students;
        Cursor cursor = db.rawQuery(query, null);
        while (cursor.moveToNext()) {
            HashMap<String, String> student = new HashMap<>();
            student.put("rollNo", cursor.getString(cursor.getColumnIndex(KEY_ROLLNO)));
```

```
            student.put("name", cursor.getString(cursor.getColumnIndex(KEY_NAME)));
            student.put("cMarks", cursor.getString(cursor.getColumnIndex(KEY_CMarks)));
            student.put("javaMarks", cursor.getString(cursor.getColumnIndex(KEY_JavaMarks)));
            student.put("pythonMarks", cursor.getString(cursor.getColumnIndex(KEY_PythonMarks)));
            student.put("id", cursor.getString(cursor.getColumnIndex(KEY_ID)));
            studentList.add(student);
        }
        return studentList;
    }
    @SuppressLint("Range")
    public ArrayList<HashMap<String, String>> GetStudentById(int studentId) {
        SQLiteDatabase db = this.getWritableDatabase();
        ArrayList<HashMap<String, String>> studentList = new ArrayList<>();
        String query = "SELECT rollno, name, c_marks, java_marks, python_marks FROM " +
TABLE_Students;
        Cursor cursor = db.query(TABLE_Students, new String[]{KEY_ROLLNO, KEY_NAME, KEY_CMarks,
KEY_JavaMarks, KEY_PythonMarks},
                KEY_ID + "=?", new String[]{String.valueOf(studentId)}, null, null, null, null);
        if (cursor.moveToNext()) {
            HashMap<String, String> student = new HashMap<>();
            student.put("rollNo", cursor.getString(cursor.getColumnIndex(KEY_ROLLNO)));
            student.put("name", cursor.getString(cursor.getColumnIndex(KEY_NAME)));
            student.put("cMarks", cursor.getString(cursor.getColumnIndex(KEY_CMarks)));
            student.put("javaMarks", cursor.getString(cursor.getColumnIndex(KEY_JavaMarks)));
            student.put("pythonMarks", cursor.getString(cursor.getColumnIndex(KEY_PythonMarks)));
            student.put("id", cursor.getString(cursor.getColumnIndex(KEY_ID)));
            studentList.add(student);
        }
        return studentList;
    }
    public void DeleteStudent(int studentId) {
```

```
        SQLiteDatabase db = this.getWritableDatabase();
        db.delete(TABLE_Students, KEY_ID + " = ?", new String[]{String.valueOf(studentId)});
        db.close();
    }
    public int updateStudentDetails(String rollNo, String name, int cMarks, int javaMarks, int
pythonMarks, int id) {
        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues cValues = new ContentValues();
        cValues.put(KEY_ROLLNO, rollNo);
        cValues.put(KEY_NAME, name);
        cValues.put(KEY_CMarks, cMarks);
        cValues.put(KEY_JavaMarks, javaMarks);
        cValues.put(KEY_PythonMarks, pythonMarks);
        int count = db.update(TABLE_Students, cValues, KEY_ID + " = ?", new
String[]{String.valueOf(id)});
        db.close();
        return count;
    }

    // Delete Student Details
    public void deleteStudent(int studentId) {
        SQLiteDatabase db = this.getWritableDatabase();
        db.delete(TABLE_Students, KEY_ID + " = ?", new String[]{String.valueOf(studentId)});
        db.close();
    }

    // Get Student Details (All)
    @SuppressLint("Range")
    public ArrayList<HashMap<String, String>> getStudents() {
        SQLiteDatabase db = this.getWritableDatabase();
        ArrayList<HashMap<String, String>> studentList = new ArrayList<>();
```

```
        String query = "SELECT rollno, name, c_marks, java_marks, python_marks, id FROM " +
TABLE_Students;
        Cursor cursor = db.rawQuery(query, null);
        while (cursor.moveToNext()) {
            HashMap<String, String> student = new HashMap<>();
            student.put("rollNo", cursor.getString(cursor.getColumnIndex(KEY_ROLLNO)));
            student.put("name", cursor.getString(cursor.getColumnIndex(KEY_NAME)));
            student.put("cMarks", cursor.getString(cursor.getColumnIndex(KEY_CMarks)));
            student.put("javaMarks", cursor.getString(cursor.getColumnIndex(KEY_JavaMarks)));
            student.put("pythonMarks", cursor.getString(cursor.getColumnIndex(KEY_PythonMarks)));
            student.put("id", cursor.getString(cursor.getColumnIndex(KEY_ID)));
            studentList.add(student);
        }
        return studentList;
    }
}
```

5)MainActivity.java:

```
package com.example.apk1;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
    EditText rollNo, name, cMarks, javaMarks, pythonMarks;
    Button addButton, updateButton, deleteButton, displayButton;
    Intent intent;
```

```
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        rollNo = findViewById(R.id.txtRollNo);
        name = findViewById(R.id.txtName);
        cMarks = findViewById(R.id.txtCMarks);
        javaMarks = findViewById(R.id.txtJavaMarks);
        pythonMarks = findViewById(R.id.txtPythonMarks);
        addButton = findViewById(R.id.btnAdd);
        updateButton = findViewById(R.id.btnUpdate);
        deleteButton = findViewById(R.id.btnDelete);
        displayButton = findViewById(R.id.btnDisplay);
        addButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String rollNo1 = rollNo.getText().toString();
                String name1 = name.getText().toString();
                String cMarks1 = cMarks.getText().toString();
                String javaMarks1 = javaMarks.getText().toString();
                String pythonMarks1 = pythonMarks.getText().toString();

                if (rollNo1.isEmpty() || name1.isEmpty()) {
                    Toast.makeText(getApplicationContext(), "Roll No and Name are required.",
Toast.LENGTH_SHORT).show();
                    return;
                }
                DbHandler dbHandler = new DbHandler(MainActivity.this);
                dbHandler.insertStudentDetails(rollNo1, name1, Integer.parseInt(cMarks1),
Integer.parseInt(javaMarks1), Integer.parseInt(pythonMarks1));
```

```
            Toast.makeText(getApplicationContext(), "Student Details Inserted Successfully",
Toast.LENGTH_SHORT).show();
        }
    });
    updateButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            String rollNo1 = rollNo.getText().toString();
            String name1 = name.getText().toString();
            String cMarks1 = cMarks.getText().toString();
            String javaMarks1 = javaMarks.getText().toString();
            String pythonMarks1 = pythonMarks.getText().toString();
            // Get the student ID that you want to update (you should have this information)
            int studentIdToUpdate = 1; // Replace with the actual student ID


            DbHandler dbHandler = new DbHandler(MainActivity.this);
            int updatedRowCount = dbHandler.updateStudentDetails(rollNo1, name1,
Integer.parseInt(cMarks1), Integer.parseInt(javaMarks1), Integer.parseInt(pythonMarks1),
studentIdToUpdate);
            if (updatedRowCount > 0) {
                Toast.makeText(getApplicationContext(), "Student Details Updated Successfully",
Toast.LENGTH_SHORT).show();
            } else {
                Toast.makeText(getApplicationContext(), "Failed to update student details",
Toast.LENGTH_SHORT).show();
            }
        }
    });
    deleteButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            // Get the student ID that you want to delete (you should have this information)
```

```
            int studentIdToDelete = 1; // Replace with the actual student ID
            DbHandler dbHandler = new DbHandler(MainActivity.this);
            dbHandler.deleteStudent(studentIdToDelete);
            Toast.makeText(getApplicationContext(), "Student Details Deleted Successfully",
Toast.LENGTH_SHORT).show();
        }
    });
    displayButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            intent = new Intent(MainActivity.this, DetailsActivity.class);
            startActivity(intent);
        }
    });
  }
}
```

6) DetailsActivity.java

```
package com.example.apk1;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.Button;
import android.widget.ListView;
import android.widget.SimpleAdapter;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;

import java.util.ArrayList;
import java.util.HashMap;
```

```
public class DetailsActivity extends AppCompatActivity {
    Intent intent;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.details);
        DbHandler db = new DbHandler(this);
        ArrayList<HashMap<String, String>> studentList = db.GetStudents();
        ListView lv = findViewById(R.id.studentListView);

        // Create a SimpleAdapter to populate the ListView with student data
        SimpleAdapter adapter = new SimpleAdapter(
                DetailsActivity.this,
                studentList,
                R.layout.list_row,
                new String[]{"rollNo", "name", "cMarks", "javaMarks", "pythonMarks"},
                new int[]{R.id.rollNo, R.id.name, R.id.cMarks, R.id.javaMarks, R.id.pythonMarks}
        );
        lv.setAdapter(adapter);

        lv.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
)
                HashMap<String, String> selectedStudent = studentList.get(position);
                String studentId = selectedStudent.get("id");
                Toast.makeText(DetailsActivity.this, "Selected Student ID: " + studentId,
Toast.LENGTH_SHORT).show();
            }
        });
```

```
        Button backButton = findViewById(R.id.btnBack);
        backButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                intent = new Intent(DetailsActivity.this, MainActivity.class);
                startActivity(intent);
            }
        });
    }
}
```

OUTPUT