EX:NO:05 SQLITE ROLL.NO:210701701

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**AIM:-**

Create a Database table with the following structure using SQLite: Student (Register Number, Name, CGPA). Develop an android application to perform the following operation using SQLite developer classes. 1. Insert student Details 2. Update the student Record 3. Delete a specified record. 4. View the details.

**PROCEDURE:-**

Step 1: Create activities.

Step 2: Define UI.

Step 3: Implement Functionalty.

Step 4: Handle Navigation.

Step 5: Create a database helpher classes.

Step 6: Define database schema.

Step 7: Implement CRUD operations.

Step 8: Use database in Activities.

**PROGRAM CODE:-**

**AndroidManifest.xml:**

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.studentdatabase">
    <application
        android:allowBackup="true"
```

```
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

**activity_main.xml:**

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

```
    android:id="@+id/registerNumberEditText"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Register Number"
    android:inputType="number" />
<EditText
    android:id="@+id/nameEditText"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@id/registerNumberEditText"
    android:layout_marginTop="16dp"
    android:hint="Name" />
<EditText
    android:id="@+id/cgpaEditText"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@id/nameEditText"
    android:layout_marginTop="16dp"
    android:hint="CGPA"
    android:inputType="numberDecimal" />
<Button
    android:id="@+id/insertButton"
    android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:layout_below="@id/cgpaEditText"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="16dp"
        android:text="Insert" />
    <!-- UI elements for viewing student details -->
    <ListView
        android:id="@+id/studentListView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@id/insertButton"
        android:layout_marginTop="16dp" />
</RelativeLayout>
```

**MainActivity.kt:**

```
package com.example.studentdatabase
import android.os.Bundle
import android.widget.ArrayAdapter
import android.widget.Button
import android.widget.EditText
import android.widget.ListView
import androidx.appcompat.app.AppCompatActivity
class MainActivity : AppCompatActivity() {
    private lateinit var registerNumberEditText: EditText
```

```
private lateinit var nameEditText: EditText
private lateinit var cgpaEditText: EditText
private lateinit var insertButton: Button
private lateinit var studentListView: ListView
private lateinit var dbHelper: UserDBHelper
override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_main)
    registerNumberEditText = findViewById(R.id.registerNumberEditText)
    nameEditText = findViewById(R.id.nameEditText)
    cgpaEditText = findViewById(R.id.cgpaEditText)
    insertButton = findViewById(R.id.insertButton)
    studentListView = findViewById(R.id.studentListView)
    dbHelper = UserDBHelper(this)
    insertButton.setOnClickListener {
        val registerNumber = registerNumberEditText.text.toString().toInt()
        val name = nameEditText.text.toString()
        val cgpa = cgpaEditText.text.toString().toDouble()
        val user = UserModel(registerNumber, name, cgpa)
        dbHelper.insertData(user)
        displayStudents()
    }
    displayStudents()
```

```
    }
    private fun displayStudents() {
        val users = dbHelper.getAllData()
        val adapter = ArrayAdapter(this, android.R.layout.simple_list_item_1, users)
        studentListView.adapter = adapter
    }
}
```

**DBContract.kt**:

```
package com.example.studentdatabase
import android.provider.BaseColumns
object DBContract {
    class UserEntry : BaseColumns {
        companion object {
            const val TABLE_NAME = "Student"
            const val COLUMN_REGISTER_NUMBER = "RegisterNumber"
            const val COLUMN_NAME = "Name"
            const val COLUMN_CGPA = "CGPA"
        }
    }
}
```

**UserModel.kt**:

```
package com.example.studentdatabase

data class UserModel(val registerNumber: Int, val name: String, val cgpa: Double)
{
    override fun toString(): String {
        return "$registerNumber - $name - $cgpa"
    }
}
```

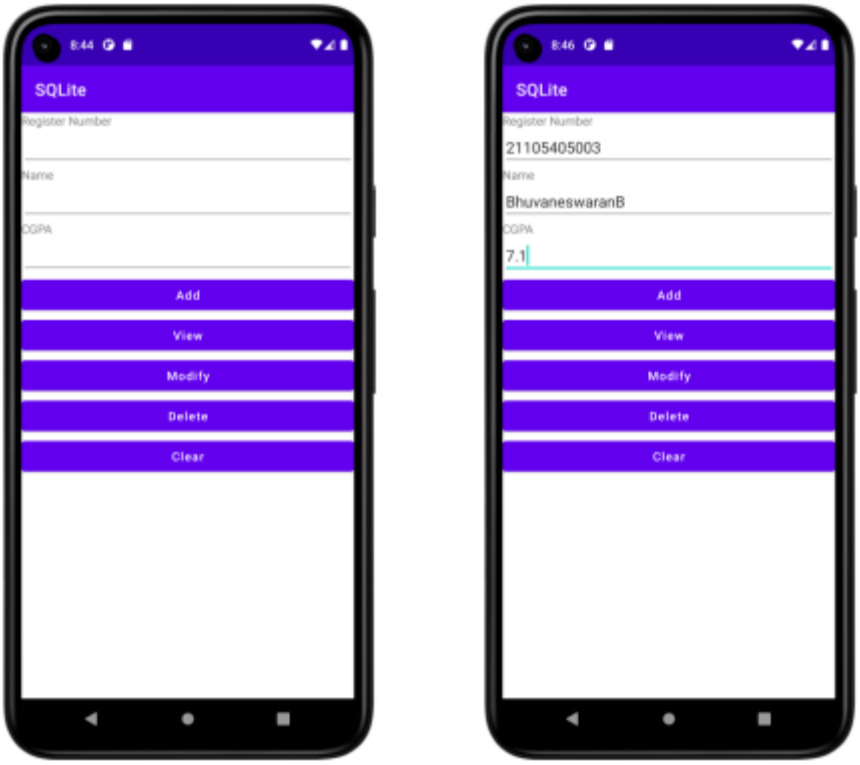
**UserDBHelper.kt**:

```
package com.example.studentdatabase

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

class UserDBHelper(context: Context) :
    SQLiteOpenHelper(context, DATABASE_NAME, null,
DATABASE_VERSION) {
    override fun onCreate(db: SQLiteDatabase) {
        val CREATE_TABLE =
            "CREATE TABLE ${DBContract.UserEntry.TABLE_NAME} (" +
                    "${DBContract.UserEntry.COLUMN_REGISTER_NUMBER}
INTEGER PRIMARY KEY," +
                    "${DBContract.UserEntry.COLUMN_NAME} TEXT," +
                    "${DBContract.UserEntry.COLUMN_CGPA} REAL)"
```

```
        db.execSQL(CREATE_TABLE)
    }
    override fun onUpgrade(db: SQLiteDatabase, oldVersion: Int, newVersion: Int)
{
        db.execSQL("DROP TABLE IF EXISTS
${DBContract.UserEntry.TABLE_NAME}")
        onCreate(db)
    }
    fun insertData(user: UserModel) {
        val db = this.writableDatabase
        val values = ContentValues().apply {
            put(DBContract.UserEntry.COLUMN_REGISTER_NUMBER,
user.registerNumber)
            put(DBContract.UserEntry.COLUMN_NAME, user.name)
            put(DBContract.UserEntry.COLUMN_CGPA, user.cgpa)
        }
        db.insert(DBContract.UserEntry.TABLE_NAME, null, values)
        db.close()
    }
    fun getAllData(): List<UserModel> {
        val userList = mutableListOf<UserModel>()
        val db = this.readableDatabase
        val cursor = db.rawQuery("SELECT * FROM
${DBContract.UserEntry.TABLE_NAME}", null)
```

```
        if (cursor.moveToFirst()) {
            do {
                val registerNumber =
cursor.getInt(cursor.getColumnIndex(DBContract.UserEntry.COLUMN_REGIST
ER_NUMBER))
                val name =
cursor.getString(cursor.getColumnIndex(DBContract.UserEntry.COLUMN_NAM
E))
                val cgpa =
cursor.getDouble(cursor.getColumnIndex(DBContract.UserEntry.COLUMN_CGP
A))
                userList.add(UserModel(registerNumber, name, cgpa))
            } while (cursor.moveToNext())
        }
        cursor.close()
        db.close()
        return userList
    }
    companion object {
        private const val DATABASE_VERSION = 1
        private const val DATABASE_NAME = "StudentDatabase"
    }
}
```

**OUTPUT:-**




**RESULT:-**

Thus to develop an android application to perform the following operation using SQLite developer classes is implemented and executed successfully.