**EX NO:5** **REGISTER NO:210701509**

**DATE:**

## SQLite

**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:**

- Open Android Studio and import the package
- In activity_main.xml drag and drop the buttons
- The button needs to perform actions to change the colour, font size and background colour
- Click android virtual device that should control the toolbar
- Design the graphical layout with the textview and buttons
- Run the application
- The version of android and name is displayed
- The theme of the file is also mentioned in a file
- Run the file using the version which is displayed to the users.

**PROGRAM CODE:**

**AndroidManifest.xml**

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

   <application
         android:allowBackup="true"
         android:dataExtractionRules="@xml/data_extraction_rules"
         android:fullBackupContent="@xml/backup_rules"
         android:icon="@mipmap/ic_launcher"
         android:label="@string/app_name"
         android:roundIcon="@mipmap/ic_launcher_round"
         android:supportsRtl="true"
         android:theme="@style/Theme.Ex5"
         tools:targetApi="31">
      <activity
            android:name=".MainActivity"
            android:exported="true">
         <intent-filter>
            <action android:name="android.intent.action.MAIN"/>

            <category android:name="android.intent.category.LAUNCHER"/>
         </intent-filter>
      </activity>
   </application>

</manifest>
```

**Activity_main.xml**

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

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

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

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

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

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

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

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

```
    <Button
        android:id="@+id/btnClear"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Clear" />
    <TextView
        android:text=""
        android:textSize="15dp"
        android:layout_width="376dp"
        android:layout_height="308dp" android:id="@+id/tvDetails"/>

</LinearLayout>
```

**DBContract.kt**

```
package com.example.ex5

import android.provider.BaseColumns

class DBContract {
    class StudentEntry : 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.ex5

data class UserModel(val registerNumber: Int, val name: String, val cgpa: Double)
```

**UserDBHelper.kt**

```
import  android.content.Context
import android.database.sqlite.SQLiteDatabase
import android.database.sqlite.SQLiteOpenHelper
import com.example.ex5.DBContract

class UsersDBHelper(context: Context) : SQLiteOpenHelper(context, DATABASE_NAME, null,
DATABASE_VERSION) {

    override fun onCreate(db: SQLiteDatabase) {
        val SQL_CREATE_ENTRIES =
            "CREATE TABLE ${DBContract.StudentEntry.TABLE_NAME} (" +
                    "${DBContract.StudentEntry.COLUMN_REGISTER_NUMBER} INTEGER PRIMARY
KEY," +
                    "${DBContract.StudentEntry.COLUMN_NAME} TEXT," +
                    "${DBContract.StudentEntry.COLUMN_CGPA} REAL)"
```

```
        db.execSQL(SQL_CREATE_ENTRIES)
    }

    override fun onUpgrade(db: SQLiteDatabase, oldVersion: Int, newVersion: Int) {
        db.execSQL("DROP TABLE IF EXISTS ${DBContract.StudentEntry.TABLE_NAME}")
        onCreate(db)
    }

    companion object {
        const val DATABASE_VERSION = 1
        const val DATABASE_NAME = "Users.db"
    }
}
```

**MainAcytivity.kt**

```
package com.example.ex5

import UsersDBHelper
import android.content.ContentValues
import android.content.Context
import android.database.Cursor
import android.database.sqlite.SQLiteDatabase
import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.TextView
import android.widget.Toast
import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {

    private lateinit var etRegisterNumber: EditText
    private lateinit var etName: EditText
    private lateinit var etCGPA: EditText
    private lateinit var btnAdd: Button
    private lateinit var btnModify: Button
    private lateinit var btnDelete: Button
    private lateinit var btnView: Button
    private lateinit var btnClear: Button
    private lateinit var tvDetails: TextView

    private lateinit var dbHelper: UsersDBHelper

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
```

```
    dbHelper = UsersDBHelper(this)

    etRegisterNumber = findViewById(R.id.etRegisterNumber)
    etName = findViewById(R.id.etName)
    etCGPA = findViewById(R.id.etCGPA)
    btnAdd = findViewById(R.id.btnAdd)
    btnModify = findViewById(R.id.btnModify)
    btnDelete = findViewById(R.id.btnDelete)
    btnView = findViewById(R.id.btnView)
    btnClear = findViewById(R.id.btnClear)
    tvDetails = findViewById(R.id.tvDetails)

    btnAdd.setOnClickListener {
        insertData()
    }

    btnModify.setOnClickListener {
        updateData()
    }

    btnDelete.setOnClickListener {
        deleteData()
    }

    btnView.setOnClickListener {
        viewData()
    }

    btnClear.setOnClickListener {
        clearFields()
    }
}

private fun insertData() {
    val registerNumber = etRegisterNumber.text.toString().toInt()
    val name = etName.text.toString()
    val cgpa = etCGPA.text.toString().toDouble()

    val db = dbHelper.writableDatabase

    val values = ContentValues().apply {
        put(DBContract.StudentEntry.COLUMN_REGISTER_NUMBER, registerNumber)
        put(DBContract.StudentEntry.COLUMN_NAME, name)
        put(DBContract.StudentEntry.COLUMN_CGPA, cgpa)
    }

    val newRowId = db?.insert(DBContract.StudentEntry.TABLE_NAME, null, values)
```

```
    Toast.makeText(this, "Inserted Row ID: $newRowId", Toast.LENGTH_SHORT).show()
}

private fun updateData() {
    val registerNumber = etRegisterNumber.text.toString().toInt()
    val name = etName.text.toString()
    val cgpa = etCGPA.text.toString().toDouble()

    val db = dbHelper.writableDatabase

    val values = ContentValues().apply {
        put(DBContract.StudentEntry.COLUMN_NAME, name)
        put(DBContract.StudentEntry.COLUMN_CGPA, cgpa)
    }

    val selection = "${DBContract.StudentEntry.COLUMN_REGISTER_NUMBER} = ?"
    val selectionArgs = arrayOf(registerNumber.toString())

    val count = db?.update(
        DBContract.StudentEntry.TABLE_NAME,
        values,
        selection,
        selectionArgs
    )

    Toast.makeText(this, "Updated $count rows", Toast.LENGTH_SHORT).show()
}

private fun deleteData() {
    val registerNumber = etRegisterNumber.text.toString().toInt()

    val db = dbHelper.writableDatabase

    val selection = "${DBContract.StudentEntry.COLUMN_REGISTER_NUMBER} = ?"
    val selectionArgs = arrayOf(registerNumber.toString())

    val deletedRows = db?.delete(DBContract.StudentEntry.TABLE_NAME, selection, selectionArgs)

    Toast.makeText(this, "Deleted $deletedRows rows", Toast.LENGTH_SHORT).show()
}

private fun viewData() {
    val db = dbHelper.readableDatabase

    val cursor = db?.query(
        DBContract.StudentEntry.TABLE_NAME,
        null,
```

```
            null,
            null,
            null,
            null,
            null
        )

        tvDetails.text = ""
        cursor?.moveToFirst()
        while (cursor?.moveToNext() == true) {
            val registerNumber =
cursor.getInt(cursor.getColumnIndexOrThrow(DBContract.StudentEntry.COLUMN_REGISTER_NUMBE
R))
            val name =
cursor.getString(cursor.getColumnIndexOrThrow(DBContract.StudentEntry.COLUMN_NAME))
            val cgpa =
cursor.getDouble(cursor.getColumnIndexOrThrow(DBContract.StudentEntry.COLUMN_CGPA))

            tvDetails.append("Register Number: $registerNumber, Name: $name, CGPA: $cgpa\n")
        }

        cursor?.close()
    }

    private fun clearFields() {
        etRegisterNumber.text.clear()
        etName.text.clear()
        etCGPA.text.clear()
    }

    override fun onDestroy() {
        dbHelper.close()
        super.onDestroy()
    }
}
```

**OUTPUT:**


**RESULT:**