- **MainActivity.kt**

```kotlin
package com.example.lab10sqlite

import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.os.Handler
import android.view.LayoutInflater
import android.view.View
import android.widget.Toast
import androidx.appcompat.app.AlertDialog
import androidx.recyclerview.widget.DividerItemDecoration
import androidx.recyclerview.widget.LinearLayoutManager
import com.example.lab10sqlite.databinding.ActivityMainBinding
import com.google.android.material.textfield.TextInputEditText
import layout.DatabaseHelper
import layout.Student
import layout.StudentsAdapter

class MainActivity : AppCompatActivity() {
    private lateinit var binding: ActivityMainBinding
    private lateinit var dbHandler:DatabaseHelper
    private var studentList = arrayListOf<Student>()
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        binding = ActivityMainBinding.inflate(layoutInflater)
        setContentView(binding.root)

        dbHandler = DatabaseHelper.getInstance(this)
        dbHandler.writableDatabase
        callStudentdata()
        binding.recyclerView.adapter =
StudentsAdapter(studentList,applicationContext)
        binding.recyclerView.layoutManager =
LinearLayoutManager(applicationContext)

binding.recyclerView.addItemDecoration(DividerItemDecoration(applicatio
nContext,
                LinearLayoutManager.VERTICAL ))
    }

    override fun onResume() {
        super.onResume()
        callStudentdata()
    }
    fun callStudentdata(){
        studentList.clear()
        studentList.addAll(dbHandler.getAllStudent())
        binding.recyclerView.adapter?.notifyDataSetChanged()
    }
    fun addStudentDialog(view: View){
        val mDialogView =
LayoutInflater.from(this).inflate(R.layout.insert_layout,null)
        val myBuilder = AlertDialog.Builder(this)
```

```kotlin
            myBuilder.apply {
                setView(mDialogView)
                setPositiveButton("Save"){ dialog, _ ->
                    val id = mDialogView.findViewById(R.id.edtId) as
    TextInputEditText
                    val name = mDialogView.findViewById(R.id.edtName) as
    TextInputEditText
                    val age = mDialogView.findViewById(R.id.edtAge) as
    TextInputEditText
                    var result = dbHandler.insertStudent(Student(
                        id=id.text.toString(),
                        name=name.text.toString(),
                        age=age.text.toString().toInt()
                    ))
                    if(result>-1){
                        Toast.makeText(applicationContext, "Inserted
    success", Toast.LENGTH_LONG).show()
                        dialog.dismiss()
                        callStudentdata()
                    }else{
                        Toast.makeText(applicationContext, "Inserted
    failure", Toast.LENGTH_LONG).show()
                    }

                }
                setNegativeButton("Cancel",){dialog,_ ->
                    dialog.dismiss()
                }
                show()
            }
        }
    }
```

- **EditDeleteActivity.kt**

```kotlin
package com.example.lab10sqlite

import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.view.MenuItem
import android.view.View
import android.widget.Toast
import com.example.lab10sqlite.databinding.ActivityEditDeleteBinding
import layout.DatabaseHelper
import layout.Student

class EditDeleteActivity : AppCompatActivity() {
    private lateinit var binding: ActivityEditDeleteBinding
    private lateinit var dbHandler: DatabaseHelper
    override fun onCreate(savedInstanceState: Bundle?) {
        binding = ActivityEditDeleteBinding.inflate(layoutInflater)
        super.onCreate(savedInstanceState)
```

```kotlin
        setContentView(binding.root)

        dbHandler = DatabaseHelper.getInstance(baseContext)
        val mID = intent.getStringExtra("mId")
        val mName = intent.getStringExtra("mName")
        val mAge = intent.getStringExtra("mAge")

        binding.edtId.setText(mID)
        binding.edtId.isEnabled = false
        binding.edtName.setText(mName)
        binding.edtAge.setText(mAge)

        supportActionBar?.setDisplayHomeAsUpEnabled(true)
    }

    override fun onOptionsItemSelected(item: MenuItem): Boolean {
        if(item.itemId == android.R.id.home){
            finish()
        }
        return super.onOptionsItemSelected(item)
    }
    fun saveStudent(v: View){
        var id = binding.edtId.text.toString()
        var name = binding.edtName.text.toString()
        var age = binding.edtAge.text.toString().toInt()
        var result = dbHandler.updateStudent(
            Student(
            id=id,
            name=name,
            age=age
        )
        )
        if(result > -1){
            Toast.makeText(applicationContext, "Updated success",
Toast.LENGTH_LONG).show()
        }else{
            Toast.makeText(applicationContext, "Updated failure",
Toast.LENGTH_LONG).show()
        }
        finish()
    }

}
```

- **Student.kt**

```kotlin
package layout

data class Student(val id:String,val name: String,val age:Int){

}
```

- **DatabaseHelper.kt**

```kotlin
package layout

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.SQLiteException
import android.database.sqlite.SQLiteOpenHelper
import androidx.core.content.contentValuesOf

class DatabaseHelper private constructor(context:
Context):SQLiteOpenHelper(context,DB_NAME,null,DB_VERSION){
    companion object{
        private val DB_NAME = "StudentDB"
        private val DB_VERSION = 1
        private val TABLE_NAME = "Student"
        private val COLUMN_ID = "id"
        private val COLUMN_NAME = "name"
        private val COLUMN_Age = "age"
        private val sqliteHelper:DatabaseHelper?=null

        @Synchronized
        fun getInstance(c:Context):DatabaseHelper{
            if (sqliteHelper==null) {
                return DatabaseHelper(c.applicationContext)
            }else{
                return sqliteHelper
            }
        }
    }

    override fun onCreate(db: SQLiteDatabase?) {
        val CREATE_TABLE = "CREATE TABLE $TABLE_NAME ($COLUMN_ID TEXT PRIMARY
KEY, "+
                "$COLUMN_NAME TEXT, " + "$COLUMN_Age INTEGER)"
        db?.execSQL(CREATE_TABLE)

        val sqlInsert = "INSERT INTO $TABLE_NAME VALUES('6430202395-
9','SSTOSPHERE',20)"
        db?.execSQL(sqlInsert)
    }

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

    @SuppressLint("Range")
    fun getAllStudent():ArrayList<Student> {
        val studentList = ArrayList<Student>()
        val db = readableDatabase
```

```kotlin
        var cursor: Cursor? = null
        try {
            cursor = db.rawQuery("select * from $TABLE_NAME", null)
        } catch (e: SQLiteException) {
            onCreate(db)
            return ArrayList()
        }
        var id: String
        var name: String
        var age: Int
        if (cursor.moveToFirst()) {
            while (!cursor.isAfterLast){
                id=cursor.getString(cursor.getColumnIndex(COLUMN_ID))
                name = cursor.getString(cursor.getColumnIndex(COLUMN_NAME))
                age = cursor.getInt(cursor.getColumnIndex(COLUMN_Age))
                studentList.add(Student(id,name,age))
                cursor.moveToNext()
            }
        }
        db.close()
        return studentList
    }
    fun insertStudent(std:Student):Long{
        val db = writableDatabase
        val value = ContentValues()
        value.put(COLUMN_ID,std.id)
        value.put(COLUMN_NAME,std.name)
        value.put(COLUMN_Age,std.age)
        val success =db.insert(TABLE_NAME,null,value)
        db.close()
        return success
    }
    fun updateStudent(std: Student):Int{
        val db = writableDatabase
        val value = ContentValues()
        value.put(COLUMN_NAME,std.name)
        value.put(COLUMN_Age,std.age)
        val success = db.update(TABLE_NAME,value,"$COLUMN_ID=?",
arrayOf(std.id))
        db.close()
        return success
    }
    fun deleteStudent(std_id:String):Int{
        val db = writableDatabase
        val success = db.delete(TABLE_NAME,"$COLUMN_ID = ?", arrayOf(std_id))
        db.close()
        return success
    }
}
```

- **StudentsAdapter.kt**

```kotlin
package layout

import android.content.Context
import android.content.Intent
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import android.widget.Toast
import androidx.recyclerview.widget.RecyclerView
import com.example.lab10sqlite.EditDeleteActivity
import com.example.lab10sqlite.databinding.StdItemLayoutBinding

class StudentsAdapter (val items:List<Student>,val context: Context)
    :RecyclerView.Adapter<StudentsAdapter.ViewHolder>(){

    inner class ViewHolder (view: View,val binding:
StdItemLayoutBinding):
        RecyclerView.ViewHolder(view){
        init {
            binding.txtEdit.setOnClickListener{
                val item = items[adapterPosition]
                Toast.makeText(context,"Click on movie: ${item.id}
Year: ${item.name}",
                    Toast.LENGTH_LONG).show()
                val context:Context = view.context
                val intent =
Intent(context,EditDeleteActivity::class.java)
                intent.putExtra("mId",item.id)
                intent.putExtra("mName",item.name)
                intent.putExtra("mAge",item.age.toString())
                context.startActivity(intent)
            }
        }
    }

    override fun onCreateViewHolder(parent: ViewGroup, viewType: Int):
ViewHolder {
        val binding =
StdItemLayoutBinding.inflate(LayoutInflater.from(parent.context),
            parent,false)
        return ViewHolder(binding.root,binding)
    }

    override fun onBindViewHolder(holder: ViewHolder, position: Int) {
        val binding = holder.binding
        binding.txtId.text = "ID:"+items[position].id
        binding.txtName.text = "Name:"+items[position].name
        binding.txtAge.text = "Age:"+items[position].age
    }

    override fun getItemCount(): Int {
        return items.size
    }
```

```
        }
```

- **activity_main.xml**

```xml
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/txt1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Student List"
        android:textColor="#0B0B0B"
        android:textSize="25sp"
        android:textStyle="bold"/>
    <androidx.appcompat.widget.AppCompatButton
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/btnAddstudent"
        android:text="Add Student"
        android:background="#0FEA7F"
        android:textColor="#ffff"
        android:onClick="addStudentDialog"
        android:padding="7dp"
        android:layout_alignParentRight="true"/>
    <androidx.recyclerview.widget.RecyclerView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:id="@+id/recyclerView"
        android:scrollbars="vertical"
        android:layout_below="@id/btnAddstudent"/>
</RelativeLayout>
```

- **insert_layout.xml**

```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="15dp">
    <TextView
```

```xml
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Add Student Dailog"
        android:textAlignment="center"
        android:textSize="25sp"
        android:textStyle="bold"/>
    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"

style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
        android:hint="Student ID"
        android:layout_marginTop="12dp">
        <com.google.android.material.textfield.TextInputEditText
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:id="@+id/edtId"
            android:inputType="text"
            android:textSize="20sp"/>
    </com.google.android.material.textfield.TextInputLayout>

    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"

style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
        android:hint="Student Name"
        android:layout_marginTop="12dp">
        <com.google.android.material.textfield.TextInputEditText
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:id="@+id/edtName"
            android:inputType="text"
            android:textSize="20sp"/>
    </com.google.android.material.textfield.TextInputLayout>

    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"

style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
        android:hint="Age"
        android:layout_marginTop="12dp">
        <com.google.android.material.textfield.TextInputEditText
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:id="@+id/edtAge"
            android:inputType="text"
            android:textSize="20sp"/>
    </com.google.android.material.textfield.TextInputLayout>
</LinearLayout>
```
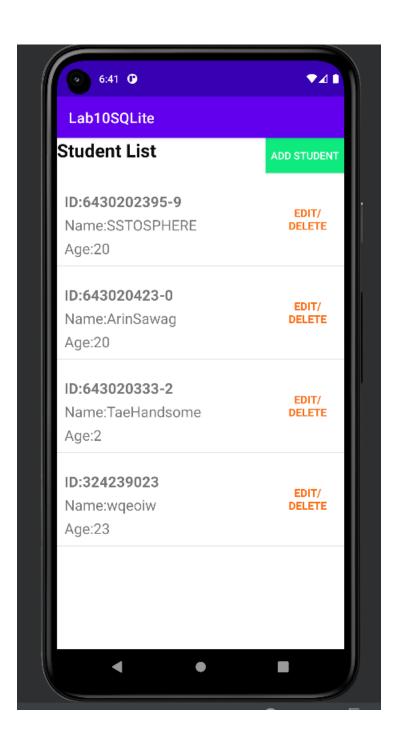
- **activity_edit_delete.xml**

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="15dp"
    tools:context=".EditDeleteActivity">
    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Edit or Delete Student"
        android:textAlignment="center"
        android:textSize="25sp"
        android:textStyle="bold"/>
    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
        android:hint="Student ID"
        android:layout_marginTop="12dp">
        <com.google.android.material.textfield.TextInputEditText
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:id="@+id/edtId"
            android:inputType="text"
            android:textSize="20sp"/>
    </com.google.android.material.textfield.TextInputLayout>

    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
        android:hint="Student Name"
        android:layout_marginTop="12dp">
        <com.google.android.material.textfield.TextInputEditText
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:id="@+id/edtName"
            android:inputType="text"
            android:textSize="20sp"/>
    </com.google.android.material.textfield.TextInputLayout>

    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
        android:hint="Age"
        android:layout_marginTop="12dp">
        <com.google.android.material.textfield.TextInputEditText
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
```

```xml
        android:id="@+id/edtAge"
        android:inputType="text"
        android:textSize="20sp"/>
</com.google.android.material.textfield.TextInputLayout>

<androidx.appcompat.widget.AppCompatButton
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:background="#70ECAF"
    android:onClick="saveStudent"
    android:text="Save"
    android:textSize="20sp"/>
<androidx.appcompat.widget.AppCompatButton
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:background="#FB8E8E"
    android:onClick="deleteStudent"
    android:text="Delete"
    android:textSize="20sp"/>
</LinearLayout>
```

- **std_item_layout.xml**

```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:padding="10dp">

    <TextView
        android:id="@+id/txtId"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_marginTop="15dp"
        android:text="ID"
        android:textStyle="bold"
        android:textSize="20sp"/>
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/txtName"
        android:layout_below="@id/txtId"
        android:layout_marginTop="5dp"
        android:text="Name"
        android:textSize="20sp"/>
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/txtAge"
        android:layout_below="@id/txtName"
        android:layout_marginTop="5dp"
```

```xml
            android:text="Age"
            android:textSize="20sp"/>
        <TextView
            android:id="@+id/txtEdit"
            android:layout_width="80dp"
            android:layout_height="wrap_content"
            android:layout_alignParentEnd="true"
            android:layout_alignParentRight="true"
            android:layout_centerVertical="true"
            android:textColor="#fc6b10"
            android:gravity="center"
            android:textSize="15sp"
            android:textStyle="bold"
            android:text="EDIT/DELETE"/>
    </RelativeLayout>
```
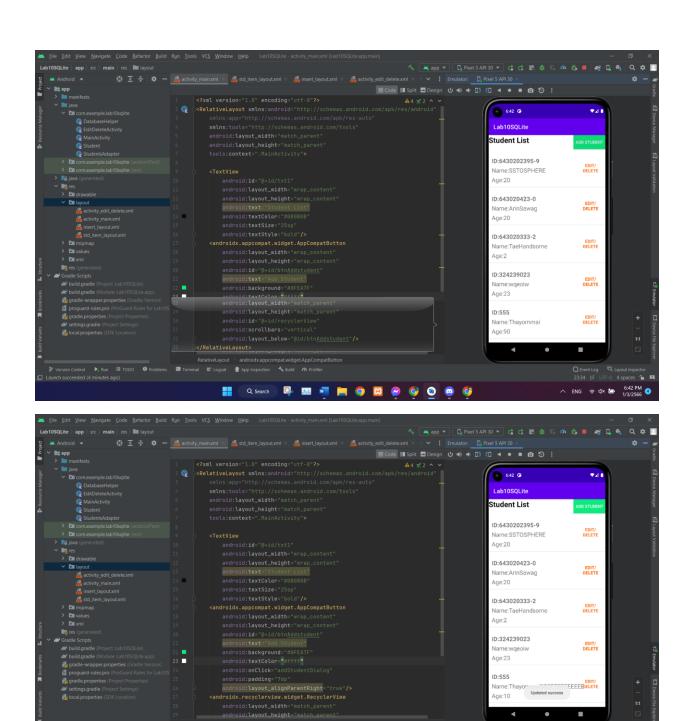
Lab10SQLite

Student List

ID:6430202395-9

Name:SSTOSPHERE

Age:20

EDIT/
DELETE

ID:643020423-0

Name:ArinSawag

Age:20

EDIT/
DELETE

ID:643020333-2

Name:TaeHandsome

Age:2

EDIT/
DELETE

ID:324239023

Name:wqeoiw

Age:23

EDIT/
DELETE

Lab10SQLite

Student List   ADD STUDENT

ID:6430202395-9
Name:SSTOSPHERE   EDIT/
                                    DELETE
A

Add Student Dailog

Student ID
S

Student Name

Age

CANCEL   SAVE

Name:wqeolw   DELETE
Age:23