SQLite.txt

```Project Name: Student Database```

1. xml Layouts:

1.1. 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"
    android:padding="16dp"
    android:background="@drawable/background_picture"
    android:gravity="center_vertical">

    <!-- Name EditText -->
    <EditText
        android:id="@+id/edtName"
        android:layout_marginTop="100dp"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Name"
        android:textColorHint="@color/black"
        android:textColor="@color/black"
        android:inputType="textPersonName"
        android:importantForAccessibility="yes"
        android:contentDescription="Edit Text for Name"/>

    <!-- Age EditText -->
    <EditText
        android:id="@+id/edtAge"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Age"
        android:inputType="number"
        android:textColorHint="@color/black"
        android:textColor="@color/black"
        android:importantForAccessibility="yes"
        android:contentDescription="Edit Text for Age"/>

    <!-- Email EditText -->
    <EditText
        android:id="@+id/edtEmail"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Email"
        android:textColorHint="@color/black"
        android:textColor="@color/black"
        android:inputType="textEmailAddress"
        android:importantForAccessibility="yes"
        android:contentDescription="Edit Text for Email"/>

    <!-- Insert Button -->
    <Button
        android:id="@+id/btnInsert"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="Insert Data"
        android:textStyle="bold"
        android:textSize="15sp"
        android:layout_gravity="center"
        android:importantForAccessibility="yes"
        android:contentDescription="Button to Insert Data"/>

    <!-- Show Button -->
    <Button
        android:id="@+id/btnShowData"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"
        android:textSize="19sp"
        android:textStyle="bold"
        android:text="Show Data"
        android:onClick="showData"
        android:layout_gravity="center"
        android:importantForAccessibility="yes"
        android:contentDescription="Button to Insert Data"/>
</LinearLayout>
```

1.2 activity_show_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"
    android:padding="16dp"
    android:gravity="center_vertical"
    android:background="@drawable/background_picture">

    <!-- ScrollView to enable scrolling for large data -->
    <LinearLayout
        android:layout_width="264dp"
        android:layout_height="70dp"
        android:layout_marginLeft="40dp"
        android:layout_marginTop="30dp">

        <TextView
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:text="Student Details"
            android:gravity="center"
            android:textStyle="bold"
            android:textSize="35sp"
            android:textColor="@color/purple_700"
            android:fontFamily="sans-serif-smallcaps"/>
    </LinearLayout>

    <ScrollView
        android:layout_marginTop="20dp"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

        <!-- TextView to show data -->
        <TextView
            android:id="@+id/txtShowData"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
```
```

```
            android:text="No Data"
            android:textSize="18sp"
            android:textColor="@color/black"
            android:gravity="start|top"
            android:padding="8dp"
            android:scrollHorizontally="false"
            android:ellipsize="none" />
    </ScrollView>
</LinearLayout>
```

2. Java Activites :

2.1. MainActivity.java :

```
package com.example.studentdatabase;

import android.content.ContentValues;
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;
import android.content.Intent;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText edtName, edtAge, edtEmail;
    private Button btnInsert;

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

        edtName = findViewById(R.id.edtName);
        edtAge = findViewById(R.id.edtAge);
        edtEmail = findViewById(R.id.edtEmail);
        btnInsert = findViewById(R.id.btnInsert);

        final DatabaseHelper dbHelper = new DatabaseHelper(this);

        // Insert button click listener
        btnInsert.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String name = edtName.getText().toString().trim();
                String email = edtEmail.getText().toString().trim();
                String ageText = edtAge.getText().toString().trim();

                // Input validation
                if (name.isEmpty() || email.isEmpty() || ageText.isEmpty()) {
                    Toast.makeText(MainActivity.this, "Please fill all fields", Toast.LENGTH_SHORT).show();
                    return;
                }

                int age;
                try {
                    age = Integer.parseInt(ageText);  // Parsing age to integer
                } catch (NumberFormatException e) {
                    Toast.makeText(MainActivity.this, "Invalid age. Please enter a valid number.", Toast.LENGTH_SHORT).show();
                    return;
                }

                SQLiteDatabase db = dbHelper.getWritableDatabase();
                ContentValues values = new ContentValues();
                values.put(DatabaseHelper.COLUMN_NAME, name);
                values.put(DatabaseHelper.COLUMN_AGE, age);
                values.put(DatabaseHelper.COLUMN_EMAIL, email);

                // Inserting the data into the database
                long rowId = db.insert(DatabaseHelper.TABLE_STUDENTS, null, values);
                db.close();  // Closing the database

                // Checking if the insertion was successful
                if (rowId != -1) {
                    Toast.makeText(MainActivity.this, "Data Inserted Successfully!", Toast.LENGTH_SHORT).show();

                    // Navigate to ShowDataActivity to display the data
                    Intent intent = new Intent(MainActivity.this, ShowDataActivity.class);
                    startActivity(intent);

                } else {
                    Toast.makeText(MainActivity.this, "Failed to Insert Data", Toast.LENGTH_SHORT).show();
                }
            }
        });


    }

    public void showData(View view){
        Button showBtn = findViewById(R.id.btnShowData);
        showBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {

                Toast.makeText(MainActivity.this, "Opening Database..", Toast.LENGTH_SHORT).show();

                Intent intent = new Intent(MainActivity.this, ShowDataActivity.class);
                startActivity(intent);
            }
        });

    }
}
```

2.2. ShowDataActivity :

```
package com.example.studentdatabase;

import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.util.Log;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class ShowDataActivity extends AppCompatActivity {
```

```
    private TextView txtShowData;

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

        // Initialize TextView for displaying data
        txtShowData = findViewById(R.id.txtShowData);

        // Create instance of DatabaseHelper
        DatabaseHelper dbHelper = new DatabaseHelper(this);
        SQLiteDatabase db = dbHelper.getReadableDatabase();

        // Query all student data
        Cursor cursor = db.query(DatabaseHelper.TABLE_STUDENTS, null, null, null, null, null, null);

        StringBuilder data = new StringBuilder();

        // Check if data exists
        if (cursor != null && cursor.getCount() > 0) {
            // Iterate over the result set
            while (cursor.moveToNext()) {
                // Get the column indices
                int idIndex = cursor.getColumnIndex(DatabaseHelper.COLUMN_ID);
                int nameIndex = cursor.getColumnIndex(DatabaseHelper.COLUMN_NAME);
                int ageIndex = cursor.getColumnIndex(DatabaseHelper.COLUMN_AGE);
                int emailIndex = cursor.getColumnIndex(DatabaseHelper.COLUMN_EMAIL);

                // Check if columns are valid
                if (idIndex != -1 && nameIndex != -1 && ageIndex != -1 && emailIndex != -1) {
                    int id = cursor.getInt(idIndex);
                    String name = cursor.getString(nameIndex);
                    int age = cursor.getInt(ageIndex);
                    String email = cursor.getString(emailIndex);

                    // Append the data to the StringBuilder
                    data.append("ID: ").append(id).append("\n")
                            .append("Name: ").append(name).append("\n")
                            .append("Age: ").append(age).append("\n")
                            .append("Email: ").append(email).append("\n\n");
                } else {
                    Log.e("DatabaseError", "One or more columns are missing in the cursor.");
                }
            }

            // Close the cursor after use
            cursor.close();
        } else {
            data.append("No data available.");
        }

        // Set the data to the TextView
        txtShowData.setText(data.toString());
    }
}
```

3. Java Class :

3.1. DatabaseHelper.java :

```
package com.example.studentdatabase;

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

public class DatabaseHelper extends SQLiteOpenHelper {

    // Database constants
    private static final String DATABASE_NAME = "studentDatabase.db";
    private static final int DATABASE_VERSION = 1;

    // Table and columns names
    public static final String TABLE_STUDENTS = "students";
    public static final String COLUMN_ID = "id";
    public static final String COLUMN_NAME = "name";
    public static final String COLUMN_AGE = "age";
    public static final String COLUMN_EMAIL = "email";

    // SQL query to create the table
    private static final String TABLE_CREATE =
            "CREATE TABLE " + TABLE_STUDENTS + " (" +
                    COLUMN_ID + " INTEGER PRIMARY KEY AUTOINCREMENT, " +
                    COLUMN_NAME + " TEXT NOT NULL, " +
                    COLUMN_AGE + " INTEGER NOT NULL, " +
                    COLUMN_EMAIL + " TEXT NOT NULL);";

    // Constructor for DatabaseHelper
    public DatabaseHelper(Context context) {
        super(context, DATABASE_NAME, null, DATABASE_VERSION);
    }

    // This method is called when the database is created for the first time
    @Override
    public void onCreate(SQLiteDatabase db) {
        db.execSQL(TABLE_CREATE);
    }

    // This method is called when the database needs to be upgraded (e.g., schema changes)
    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
        // Log to see when the upgrade happens (useful during debugging)
        // You may want to handle more complex upgrade scenarios in future versions
        db.execSQL("DROP TABLE IF EXISTS " + TABLE_STUDENTS);
        onCreate(db);  // Recreate the table after dropping it
    }
}
```

4. Gradle.kts :

```
// Add:
    buildFeatures{
        viewBinding = true
    }
```