

## Lab 14

# Reading and Storing App data in to SQLite Databases

### Exercise 14.1:

Implement the following Android App activities using SQLite database to store and read records of students.

OF ENGINEERING

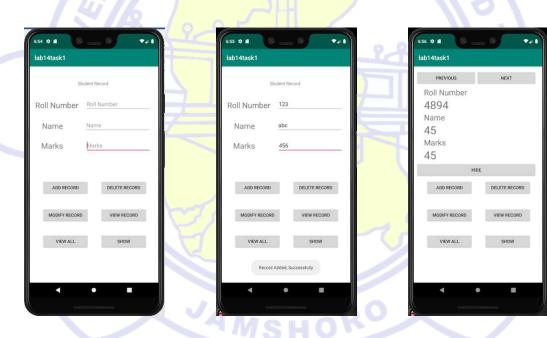
#### Solution

Language: Java

Platform: Android Studio

**Database:** SQLite

**OUTPUT** 



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```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"</pre>
        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:background="#FFFFFF"
tools:context=".MainActivity">
       <TextView
                android:id="@+id/textView"
                 android:layout_width="wrap_content"
                android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="8dp"
android:layout_marginTop="8dp"
android:layout_marginTop="8dp"
                android:text="Student Record"
app:layout_constraintBottom_toBottomOf="parent"
                 app:layout_constraintEnd_toEndOf="parent
                 app:layout_constraintHorizontal_bias="0.491"
                app:layout_constraintStart_toStartOf="parent" app:layout_constraintTop_toTopOf="parent" app:layout_constraintVertical_bias="0.056" />
                 android:id="@+id/textView2"
                android:ld="@4-id/textVlew2"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="8dp"
android:layout_marginTop="8dp"
android:layout_marginEnd="8dp"
android:layout_marginEnd="8dp"
                android:text="Roll Number"
android:textSize="25sp"
                app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toStartOf="@+id/etRoll"
                 app:layout_constraintHorizontal_bias="0.4"
                app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.154" />
                android:id="@+id/etRoll"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
android:layout_marginTop="8dp"
android:layout_marginEnd="24dp"
                android:layout_marginBottom="8dp"
android:ems="10"
android:hint="Roll Number"
                android:inte"Roll Number"
android:inputType="textPersonName"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTOp_toBottomOf="@+id/textView"
app:layout_constraintTOp_toBottomOf="@+id/textView"
app:layout_constraintVertical_bias="0.046" />
       <TextView
                android:id="@+id/textView3"
                android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="8dp"
                android:layout_marginTop="8dp"
android:layout_marginEnd="8dp"
android:layout_marginBottom="8dp"
android:text="Name"
                android:textSize="25sp"
app:layout constraintBottom toBottomOf="parent"
                app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintEorizontal_bias="0.097"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/textView2"
app:layout_constraintVertical_bias="0.05" />
       <EditText
                 android:id="@+id/etName"
                android: layout_width="wrap_content"
android: layout_height="wrap_content"
android: layout_marginStart="8dp"
android: layout_marginTop="8dp"
android: layout_marginEnd="8dp"
android: layout_marginBottom="8dp"
                android:ems="10"
android:hint="Name"
                android:inputType="textPersonName"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
                app:layout_constraintHorizontal_bias="0.786"
app:layout_constraintStart_toEndOf="@+id/textView3"
                 app:layout_constraintTop_toBottomOf="@+id/etRoll"
                app:layout_constraintVertical_bias="0.03" />
```

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```
<TextView
    android:id="@+id/textView4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="8dp"
   android:layout_marginTop="8dp"
android:layout_marginEnd="8dp"
    android:layout_marginBottom="8dp'
    android: text="Marks"
    android:textSize="25sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.089"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/textView3"
    app:layout_constraintVertical_bias="0.051" />
<EditText
    android:id="@+id/etMarks"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="8dp"
    android:layout_marginTop="8dp"
    android:layout_marginEnd="8dp"
    android:layout_marginBottom="8dp"
    android:ems="10"
                                     android:hint="Marks"
    android:inputType="textPersonName"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.807"
    app:layout_constraintStart_toEndOf="@+id/textView4"
    app:layout_constraintTop_toBottomOf="@+id/etName"
    app:layout_constraintVertical_bias="0.028" />
<Button
    android:id="@+id/button"
    android:layout_width="150dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="40dp'
    android:layout_marginTop="364dp"
    android: onClick="onAdd"
    android:text="Add Record"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
<Button
   android:id="@+id/button2"
    android:layout_width="150dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="8dp
    android:layout_marginTop="364dp"
    android:layout_marginEnd="8dp'
    android: onClick="onDelete"
    android:text="Delete Record"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.509"
    app:layout_constraintStart_toEndOf="@+id/button"
    app:layout_constraintTop_toTopOf="parent" />
<Button
    android:id="@+id/button3"
    android:layout_width="150dp"
    android: layout_height="wrap_content"
    android:layout_marginStart="40dp"
    android:layout_marginTop="40dp'
    android:onClick="onUpdate"
    android:text="Modify Record"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/button" />
<Button
    android:id="@+id/button4"
    android:layout_width="150dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="8dp"
    android:layout_marginTop="40dp'
    android:layout_marginEnd="8dp"
    android:onClick="onView"
                                                 android:text="View Record"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout constraintHorizontal bias="0.509"
    app:layout_constraintStart_toEndOf="@+id/button3"
    app:layout_constraintTop_toBottomOf="@+id/button2" />
```

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```
<Button
    android:id="@+id/button5"
    android:layout_width="150dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="40dp'
   android:layout_marginTop="36dp"
android:text="View All"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/button3" />
<Button
    android:id="@+id/button6"
    android:layout_width="150dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="8dp"
    android:layout_marginTop="36dp"
    app:layout_constraintEnd_toEndOf="parent" app:layout_constraintEnd_toEndOf="parent" app:layout_constraintHorizontal_bias="0.509"
    android:layout_marginEnd="8dp"
    app:layout_constraintStart_toEndOf="@+id/button5"
    app:layout_constraintTop_toBottomOf="@+id/button4" />
<ScrollView
    android:id="@+id/sc_view"
    android:layout_width="385dp"
    android:layout_height="410dp"
    android:layout_marginStart="8dp"
    android:layout_marginTop="8dp"
    android:layout_marginEnd="8dp"
    android:layout_marginBottom="8dp"
    android:background="#FFFFFF"
    android:visibility="gone"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.0"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.0">
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical">
        <LinearLayout
            android:layout_width="match_parent"
            android:layout height="match parent"
            android:layout_marginTop="5dp"
            android:layout_marginBottom="5dp"
            android:orientation="horizontal">
            <Button
                android:id="@+id/button7"
                android:layout_width="0dp"
                android:layout_height="wrap_content"
                android:layout_weight="0.5"
                android:onClick="onPrevious"
                android:text="Previous" />
            <Button
                android:id="@+id/button8"
                android:layout_width="0dp"
                android:layout_height="wrap_content"
                android:layout_weight="0.5"
                android:onClick="onNext"
                android:text="Next" />
        </LinearLayout>
        <TextView
            android:id="@+id/textView5"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginLeft="25dp"
            android:layout_marginRight="25dp"
            android:text="Roll Number"
            android:textSize="25sp" />
        <TextView
            android:id="@+id/tvRollNoView"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginLeft="25dp"
            android:layout_marginRight="25dp"
            android:textSize="35sp" />
```

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```
<TextView
                android:id="@+id/textView7"
                android:layout width="match parent"
                android: layout height="wrap content"
                android:layout marginLeft="25dp"
                android:layout marginRight="25dp"
                android: text="Name"
                android:textSize="25sp" />
            <TextView
                android:id="@+id/tvNameView"
                android:layout width="match parent"
                android:layout_height="wrap_content"
                android:layout_marginLeft="25dp"
                android:layout marginRight="25dp"
                android:textSize="35sp" />
            <TextView
                android:id="@+id/textView9"
                android:layout width="match parent"
                android:layout_height="wrap_content"
                android:layout marginLeft="25dp"
                android:layout marginRight="25dp"
                android:text="Marks"
                android:textSize="25sp" />
            <TextView
                android:id="@+id/tvMarksView"
                android:layout width="match parent"
                android:layout height="wrap content"
                android:layout marginLeft="25dp"
                android:layout_marginRight="25dp"
                android:textSize="35sp" />
            <Button
                android:id="@+id/button9"
                android:layout width="match parent"
                android:layout height="wrap content"
                android:onClick="onBack"
                android:text="Hide" />
        </LinearLayout>
    </scrollView>
</androidx.constraintlayout.widget.ConstraintLayout>
```

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#### MainActivity.java 1.1

```
package com.example.lab14task1;
import androidx.appcompat.app.AppCompatActivity;
import android.content.ContentValues;
import android.content.Intent;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.text.TextUtils;
import android.view.View;
import android.widget.EditText;
import android.widget.ScrollView;
import android.widget.TextView;
import android.widget.Toast;
import org.w3c.dom.Text:
import static android.os.Build.ID;
public class MainActivity extends AppCompatActivity {
    EditText etRollNo, etName, etMarks;
      ScrollView sc_View;
      TextView tvRollNumberView, tvNameView, tvMarksView;
      DBHelper helper;
      SOLiteDatabase db;
      Cursor c;
      protected void onCreate(Bundle savedInstanceState) {
            super.onCreate(savedInstanceState);
            setContentView(R.layout.activity_main);
            helper = new DBHelper(this);
            etRollNo = (EditText) findViewById(R.id.etRoll);
            etName = (EditText) findViewById(R.id.etName);
etMarks = (EditText) findViewById(R.id.etName);
sc_View = (ScrollView) findViewById(R.id.sc_view);
            tvRollNumberView = (TextView) findViewById(R.id.tvRollNoView);
tvNameView = (TextView) findViewById(R.id.tvNameView);
tvMarksView = (TextView) findViewById(R.id.tvMarksView);
     public void onAdd(View v) {
   String strRollNumber = etRollNo.getText().toString();
   String strName = etName.getText().toString();
   String strMarks = etMarks.getText().toString();
            if(TextUtils.isEmpty(strRollNumber) ||TextUtils.isEmpty(strName) || TextUtils.isEmpty(strMarks) ) {
    etRollNo.setError("Write Roll Number in Integers");
                  etName.setError("Write your name correctly");
                  etMarks.setError("Enter your marks correctly in Integers");
            db = helper.getWritableDatabase();
            ContentValues values = new ContentValues();
            values.put("rollNumber", Integer.parseInt(etRollNo.getText().toString()));
            values.put("name", (etName.getText().toString()));
values.put("marks", Integer.parseInt(etMarks.getText().toString()));
            db.insert("lab14task", null, values);
Toast.makeText(this, "Record Added, Successfully", Toast.LENGTH_SHORT).show();
      public void onUpdate(View v) {
            if(TextUtils.isEmpty(etRollNo.getText().toString()) || TextUtils.isEmpty(etName.getText().toString()) ||
TextUtils.isEmpty(etMarks.getText().toString()) ) {
                  etRollNo.setError("Write Roll Number in Integers");
                  etName.setError("Write your name correctly");
                  etMarks.setError("Enter your marks correctly in Integers");
                 return;
            ContentValues cv = new ContentValues();
           ContentValues cv = new ContentValues();
cv.put("rollNumber", etRollNo.getText().toString());
cv.put("name", etName.getText().toString());
cv.put("marks", etMarks.getText().toString());
String where = "rollNumber = " + etRollNo.getText().toString();
String whereArgs[] = null;
SQLiteDatabase db = helper.getWritableDatabase();
db.update("lab14task", cv, where, whereArgs);
Toast.makeText(this, "Data Updated, successfully", Toast.LENGTH_SHORT).show();
```

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#### MainActivity.java 1.2

```
public void onDelete(View v) {
        db= helper.getWritableDatabase();
        ContentValues cv = new ContentValues();
        cv.put("rollNumber", etRollNo.getText().toString());
        String where = "rollNumber = " + etRollNo.getText().toString();
        db.delete("lab14task", where, null);
        Toast.makeText(this, "Data Deleted, successfully", Toast.LENGTH SHORT).show();
   public void onView(View v) {
        sc View.setVisibility(View.VISIBLE);
        db = helper.getReadableDatabase();
        c = db.rawQuery("SELECT rollNumber, name, marks FROM lab14task",null);
         if(c == null) {
             Toast.makeText(this, "Empty", Toast.LENGTH_SHORT).show();
         }else if(c.moveToFirst()){
             tvRollNumberView.setText(c.getString(0));
             tvNameView.setText(c.getString(1));
             tvNameView.setText(c.getString(2));
         }
    }
    public void onNext(View v) {
        if(c == null) {
            Toast.makeText(this, "Empty", Toast.LENGTH SHORT).show();
        }else if(c.moveToNext()){
            tvRollNumberView.setText((c.getString(0)));
            tvNameView.setText(c.getString(1));
            tvMarksView.setText(c.getString(2));
        }
   public void onPrevious(View v) {
        if(c.moveToPrevious()){
            tvRollNumberView.setText((c.getString(0)));
            tvNameView.setText(c.getString(1));
            tvMarksView.setText(c.getString(2));
        }
   public void onBack(View v) {
        sc View.setVisibility(View.GONE);
}
```

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#### DBHelper.java 1.1

```
package com.example.lab14task1;
import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
public class DBHelper extends SQLiteOpenHelper {
    private static String DBNAME = "StudentsDB.db";
   private static int DB VERSION = 1;
    public DBHelper(Context context) {
        super(context, DBNAME, null, DB_VERSION);
    @Override
    public void onCreate(SQLiteDatabase db) {
       db.execSQL("CREATE TABLE lab14task( id INTEGER PRIMARY KEY AUTOINCREMENT,
rollNumber INTEGER, name TEXT, marks INTEGER)");
    @Override
   public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion)
        db.execSQL("DROP TABLE IF EXISTS lab14task");
        onCreate(db);
}
```

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