PRACTICAL: 1

AIM: Create an application with the help of database.

THEORY:

SQLite Database: SQLite is a opensource SQL database that stores data to a text file on a device. Android comes in with built in SQLite database implementation. SQLite supports all the relational database features. In order to access this database, you don't need to establish any kind of connections for it like JDBC, ODBC etc.

CODE:

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"
   tools:context=".MainActivity"
   android:orientation="vertical"
   android:gravity="top"
   android:textAlignment="center"
   android:layout_marginVertical="20dp">
   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Students Details:"
      android:textAlignment="center"
      android:textSize="25dp"
      android:layout_marginVertical="20dp"/>
   <LinearLayout
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:orientation="horizontal"
      android:layout_marginBottom="10dp">
      <TextView
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:text="Enter Name:"
         android:layout_marginHorizontal="20dp"
         android:textAlignment="center"
         android:textSize="20dp"/>
      <EditText
         android:id="@+id/name"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:hint="Eg. John Cena"
         android:textSize="20dp"
         android:inputType="text"/>
```

```
</LinearLayout>
<LinearLayout
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:orientation="horizontal"
   android:layout_marginBottom="10dp">
   <TextView
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Enter RollNo.:"
      android:layout_marginHorizontal="20dp"
      android:textAlignment="center"
      android:textSize="20dp"/>
   <EditText
      android:id="@+id/rollno"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Eg. 01"
      android:textSize="20dp"
      android:inputType="number"/>
</LinearLayout>
<TextView
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:text="Operations:"
   android:textSize="25dp"
   android:textAlignment="center"
   android:layout_marginTop="35dp" />
<Button
   android:id="@+id/insert"
   android:layout_marginVertical="10dp"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:text="INSERT"
   android:textSize="20dp"
   android:backgroundTint="@color/button"/>
<Button
   android:id="@+id/update"
   android:layout_marginBottom="10dp"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:text="UPDATE"
   android:textSize="20dp"
   android:backgroundTint="@color/button"/>
<Button
   android:id="@+id/delete"
   android:layout_marginBottom="20dp"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:text="DELETE"
```

```
        android:textSize="20dp"
        android:backgroundTint="@color/button"/>
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        android:gravity="center">
        <Button
            android:id="@+id/view"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="View"
            android:textSize="20dp"
            android:paddingHorizontal="60dp"
            android:layout_marginRight="10dp"
            android:backgroundTint="@color/button"/>
        <Button
            android:id="@+id/viewAll"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="View All"
            android:textSize="20dp"
            android:layout_marginLeft="10dp"
            android:paddingHorizontal="50dp"
            android:backgroundTint="@color/button"/>
    </LinearLayout>
</LinearLayout>
```

MainActivity.java

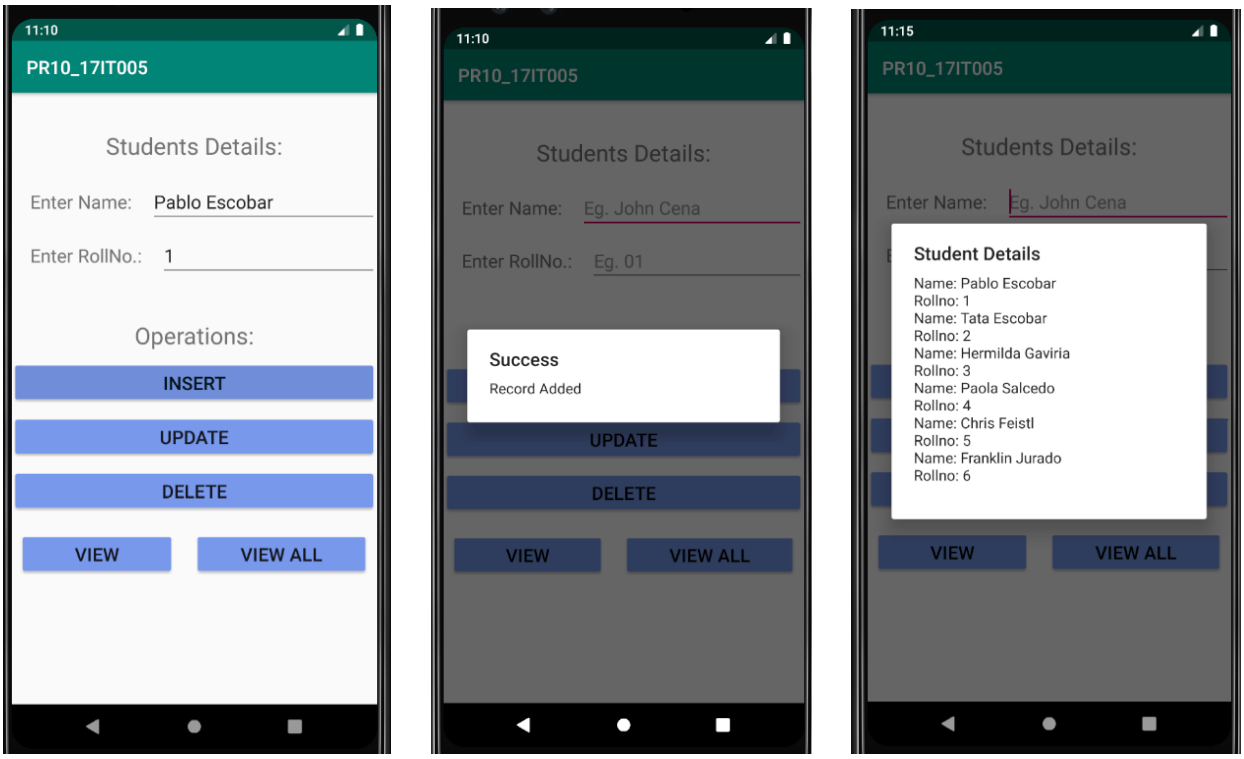
```
package com.example.pr10_17it005;
import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;

import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
public class MainActivity extends AppCompatActivity implements View.OnClickListener {
    EditText RollNo, Name;
    Button Insert, Delete, Update, View, ViewAll;
    SQLiteDatabase db;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        RollNo = findViewById(R.id.rollno);
        Name = findViewById(R.id.name);
        Insert = findViewById(R.id.insert);
```

```
        Delete = findViewById(R.id.delete);
        Update = findViewById(R.id.update);
        View = findViewById(R.id.view);
        ViewAll = findViewById(R.id.viewAll);
        db = openOrCreateDatabase("your database name",MODE_PRIVATE,null);
        db.execSQL("CREATE TABLE IF NOT EXISTS Students(Name VARCHAR, RollNo
VARCHAR)");
        Insert.setOnClickListener(this);
        Delete.setOnClickListener(this);
        Update.setOnClickListener(this);
        View.setOnClickListener(this);
        ViewAll.setOnClickListener(this);
    }
    @Override
    public void onClick(android.view.View view){
        switch (view.getId()){
            case R.id.insert:
              if (Name.getText().toString().trim().length()==0 ||
RollNo.getText().toString().trim().length()==0){
                  showMessage("Error","Invalid Input");
                  return; }
              else{
              db.execSQL("INSERT INTO Students
VALUES('"+Name.getText()+"','"+RollNo.getText()+"')");
              showMessage("Success","Record Added");}
              clearText();
            case R.id.update:
              if (RollNo.getText().toString().trim().length()==0 ||
Name.getText().toString().trim().length()==0){
                  showMessage("Error","Invalid Input");
                  return; }
              Cursor c=db.rawQuery("SELECT * FROM Students WHERE
RollNo='"+RollNo.getText()+"'", null);
              if (c.moveToFirst()){
              db.execSQL("UPDATE Students SET Name = '"+Name.getText()+"' WHERE RollNo =
'"+RollNo.getText()+"' ");
              showMessage("Success","Record Modified");}
              else {showMessage("Error","Invalid RollNo");}
              clearText();
            case R.id.delete:
              if (RollNo.getText().toString().trim().length()==0 ||
Name.getText().toString().trim().length()==0){
                  showMessage("Error","Invalid Input");
                  return; }
              Cursor c3=db.rawQuery("SELECT * FROM Students WHERE
RollNo='"+RollNo.getText()+"'", null);
              if (c3.moveToFirst()){
              db.execSQL("DELETE FROM Students WHERE RollNo = '"+RollNo.getText()+"'");
              showMessage("Success","Record Removed"); }
              else {showMessage("Error","Invalid RollNo");}
              clearText();
```

```
        case R.id.view:
            if (RollNo.getText().toString().trim().length()==0 ||
Name.getText().toString().trim().length()==0){
                showMessage("Error","Invalid Input");
                return; }
            Cursor c2=db.rawQuery("SELECT * FROM Students WHERE
RollNo='"+RollNo.getText()+"'", null);
            if (c2.moveToFirst()){
                Name.setText(c2.getString(0)); }
            else {showMessage("Error","Incorrect RollNo");}
            clearText();
        case R.id.viewAll:
            Cursor c1=db.rawQuery("SELECT * FROM Students", null);
            if (c1.getCount() == 0){
                showMessage("Error", "No records found");
                return; }
            StringBuffer buffer=new StringBuffer();
            while(c1.moveToNext())
            {
                buffer.append("Name: "+c1.getString(0)+"\n");
                buffer.append("Rollno: "+c1.getString(1)+"\n");
            }
            showMessage("Student Details", buffer.toString());
            clearText();
      }
   }
   public void showMessage(String title,String message)
   {
      AlertDialog.Builder builder=new AlertDialog.Builder(this);
      builder.setCancelable(true);
      builder.setTitle(title);
      builder.setMessage(message);
      builder.show();
   }
   public void clearText()
   {
      RollNo.setText("");
      Name.setText("");
      Name.requestFocus();
   }
}
```

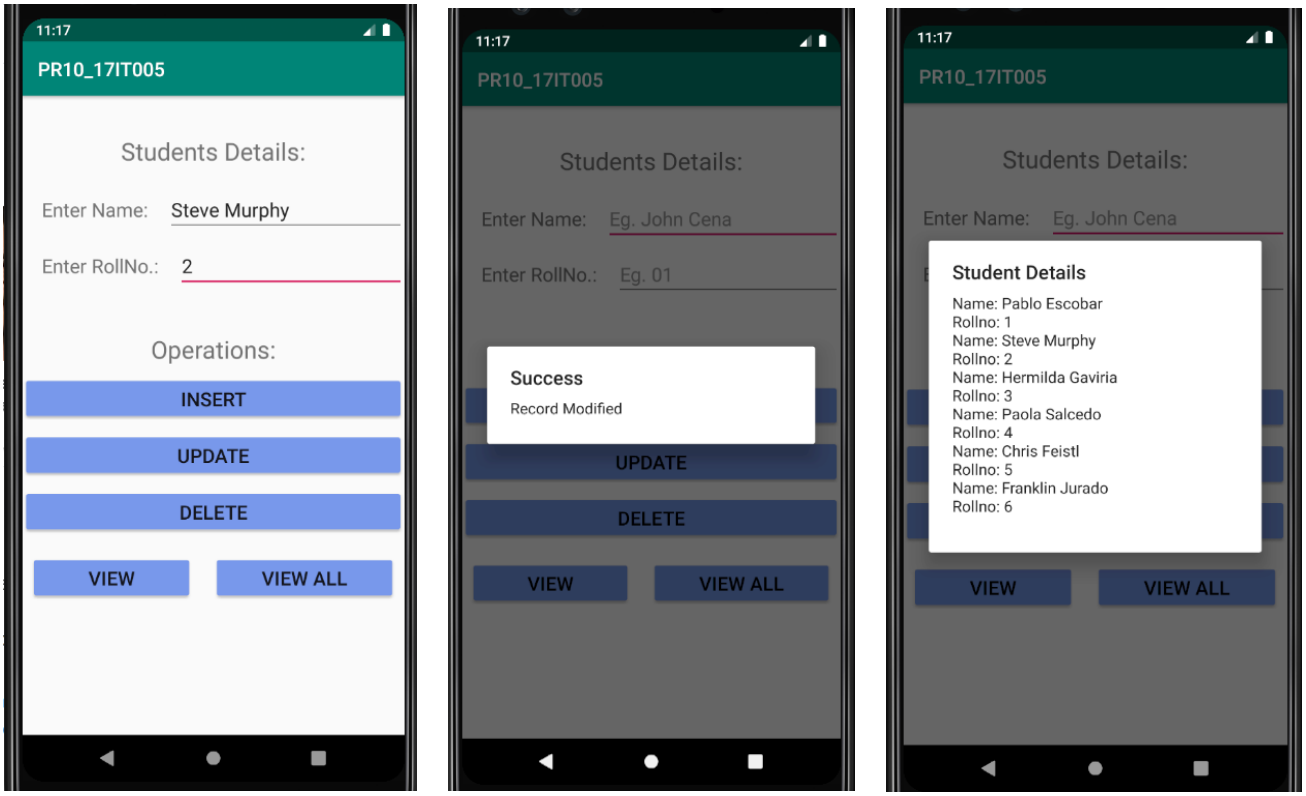
OUTPUT:

Insert Values:

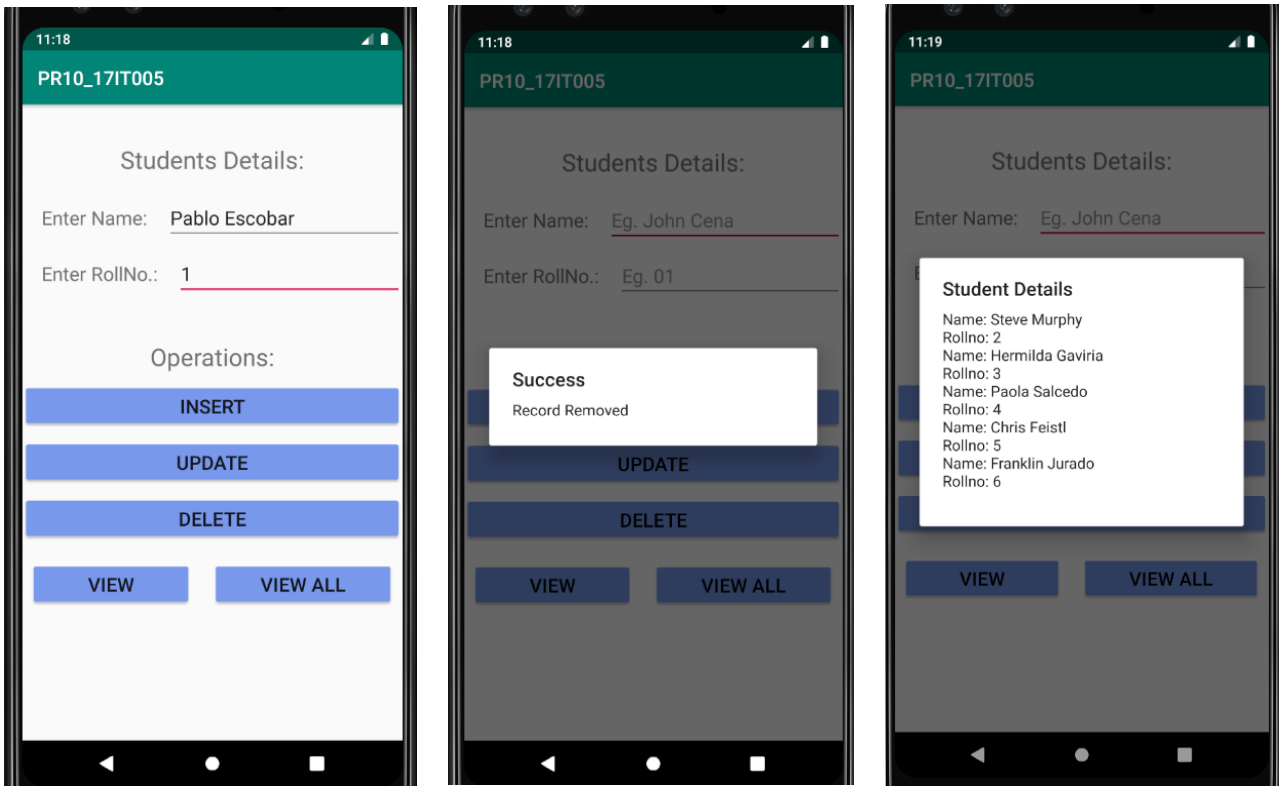


We have added 6 records in the database as we have shown the first one in first two pictures.

Update Values:



Delete Record:



LATEST APPLICATIONS: All the applications that have data storage and manipulation use data base. Though there are different data bases that can be used like SQLite, Realm DB, ORMLite, Berkeley DB, Couchbase Lite, etc.

LEARNING OUTCOME: In this practical we have used SQLite database and it's various function to perform CRUD operation. We have used Cursor class to store the fetched data from our database and to check the given input by the user. Also, we have implemented View.OnClickListener to switch between the functionalities of all the 5 buttons used based on their ids.