CS 432: Databases

Assignment 2: DEVELOPING THE DBMS

Group Name: Bro Code

Project Name: Neev Management System

Here are the name & Roll no. of the Group members:

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Responsibility of G1:

Question 1

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1. Populate the tables that you created in the previous assignment with random data with the following constraints. All tables must follow the ACID properties and the previous constraints mentioned in Assignment 1

= Following our ER Diagram we have created 6 Entities, namely:

1. Students
2. NEEV members
3. Instructors
4. Donor
5. Volunteer
6. Admin
7. Course

1. Populating the Student table

```
>> use test;
>> select * from students;
```

Attributes used: (S_ID, Name, email, Identification ID, Gender, Photo, family Background, address, M_ID(f))

Note: Our populated table Student satisfies the ACID properties.

```sql
CREATE TABLE IF NOT EXISTS students (
    S_ID INT PRIMARY KEY,
    Name VARCHAR(255),
    Email VARCHAR(255),
    Identification_ID VARCHAR(10),
    Gender ENUM('Male', 'Female'),
    Photo VARCHAR(255),
    Family_Background VARCHAR(255),
    Address VARCHAR(255),
    M_ID INT,
    FOREIGN KEY (M_ID) REFERENCES Members(M_ID)
);
```

```sql
INSERT INTO Persons (S_ID, Name, Email, Identification_ID, Gender, Photo, Family_Background, Address, M_ID) VALUES
(0001, 'Johny Pal', 'john@example.com', '1234567890', 'Male', 'photo.jpg', 'Upper class', '123 Main St, City', 1),
(0002, 'Emma Brown', 'emma@example.com', '0987654321', 'Female', 'pic.jpg', 'Middle class', '456 Elm St, Town', 2),
(0003, 'Michael Lee', 'michael@example.com', '4567890123', 'Male', 'image.jpg', 'Lower class', '789 Oak St, Village', 3),
(0004, 'Sarah Johnson', 'sarah@example.com', '9876543210', 'Female', 'img.jpg', 'Upper middle class', '321 Pine St, City', 4),
(0005, 'David Wilson', 'david@example.com', '1357902468', 'Male', 'photo2.jpg', 'Lower middle class', '654 Cedar St, Town', 5),
(0006, 'Emily Davis', 'emily@example.com', '2468013579', 'Female', 'pic2.jpg', 'Upper class', '987 Maple St, City', 1),
(0007, 'Daniel Martinez', 'daniel@example.com', '5791357024', 'Male', 'image2.jpg', 'Lower class', '258 Oak St, Village', 1),
(0008, 'Olivia Taylor', 'olivia@example.com', '7024579135', 'Female', 'img2.jpg', 'Middle class', '753 Elm St, Town', 3),
(0009, 'James Brown', 'james@example.com', '0147852369', 'Male', 'photo3.jpg', 'Lower middle class', '159 Cedar St, City', 3),
(0010, 'Sophia Garcia', 'sophia@example.com', '3691478520', 'Female', 'pic3.jpg', 'Upper middle class', '852 Pine St, Town', 3);
```

1.Students table

S_ID	Name	Email	Identification ID	Gender	Photo	Family Background	Address	M_ID (f)
0001	Johny Pal	john@example.com	1234567890	Male	photo.jpg	Upper class	123 Main St, City	1
0002	Emma Brown	emma@example.com	0987654321	Female	pic.jpg	Middle class	456 Elm St, Town	2
0003	Michael Lee	michael@example.com	4567890123	Male	image.jpg	Lower class	789 Oak St, Village	3
0004	Sarah Johnson	sarah@example.com	9876543210	Female	img.jpg	Upper middle class	321 Pine St, City	4
0005	David Wilson	david@example.com	1357902468	Male	photo2.jpg	Lower middle class	654 Cedar St, Town	5
0006	Emily Davis	emily@example.com	2468013579	Female	pic2.jpg	Upper class	987 Maple St, City	1
0007	Daniel Martinez	daniel@example.com	5791357024	Male	image2.jpg	Lower class	258 Oak St, Village	1

S_ID	Name	Email	Identification ID	Gender	Photo	Family Background	Address	M_ID (f)
0008	Olivia Taylor	olivia@example.com	7024579135	Female	img2.jpg	Middle class	753 Elm St, Town	3
0009	James Brown	james@example.com	0147852369	Male	photo3.jpg	Lower middle class	159 Cedar St, City	3
0010	Sophia Garcia	sophia@example.com	3691478520	Female	pic3.jpg	Upper middle class	852 Pine St, Town	3

S_ID	Name	Email	Identification_ID	Gender	Photo	Family_Background	Address	M_ID
1	Johny Pal	john@example.com	1234567890	Male	photo.jpg	Upper class	123 Main St, City	1
2	Emma Brown	emma@example.com	987654321	Female	pic.jpg	Middle class	456 Elm St, Town	2
3	Michael Lee	michael@example.com	4567890123	Male	image.jpg	Lower class	789 Oak St, Village	3
4	Sarah Johnson	sarah@example.com	9876543210	Female	img.jpg	Upper middle class	321 Pine St, City	4
5	David Wilson	david@example.com	1357902468	Male	photo2.jpg	Lower middle class	654 Cedar St, Town	5
6	Emily Davis	emily@example.com	2468013579	Female	pic2.jpg	Upper class	987 Maple St, City	1
7	Daniel Martinez	daniel@example.com	5791357024	Male	image2.jpg	Lower class	258 Oak St, Village	1
8	Olivia Taylor	olivia@example.com	7024579135	Female	img2.jpg	Middle class	753 Elm St, Town	3
9	James Brown	james@example.com	147852369	Male	photo3.jpg	Lower middle class	159 Cedar St, City	3
10	Sophia Garcia	sophia@example.com	3691478520	Female	pic3.jpg	Upper middle class	852 Pine St, Town	3
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

2. Populating the NEEV member's table

>> use test;
>> select * from NEEV members;

Attributes used:(M_ID, name, email, Identification ID, gender, designation, photo, password, phone no., AD_ID(f))

Note: Our populated table Student satisfies the ACID properties

```
CREATE TABLE IF NOT EXISTS NEEV_Members (
    M_ID INT PRIMARY KEY,
    Name VARCHAR(255),
    Email VARCHAR(255),
    Identification_ID VARCHAR(10),
    Gender ENUM('Male', 'Female'),
    Designation VARCHAR(255),
    Photo VARCHAR(255),
    Password VARCHAR(255),
    Phone_No VARCHAR(20)
);
```

```
INSERT INTO Employees (M_ID, Name, Email, Identification_ID, Gender, Designation, Photo, Password, Phone_No)
VALUES
(1, 'John Smith', 'john@example.com', '1234567890', 'Male', 'Manager', 'link_to_photo1', 'password1', '123-456-7890'),
(2, 'Emily Jones', 'emily@example.com', '0987654321', 'Female', 'Developer', 'link_to_photo2', 'password2', '987-654-3210'),
(3, 'Michael Lee', 'michael@example.com', '1357924680', 'Male', 'Analyst', 'link_to_photo3', 'password3', '456-789-1230'),
(4, 'Sarah Brown', 'sarah@example.com', '2468013579', 'Female', 'Designer', 'link_to_photo4', 'password4', '789-123-4560'),
(5, 'David Kim', 'david@example.com', '3692581470', 'Male', 'Intern', 'link_to_photo5', 'password5', '321-654-9870');
```

2. NEEV Members

M_ID	Name	Email	Identification ID	Gender	Designation	Photo	Password	Phone N
1	John Smith	john@example.com	1234567890	Male	Manager	(link to photo)	password1	123-456-7890
2	Emily Jones	emily@example.com	0987654321	Female	Developer	(link to photo)	password2	987-654-3210
3	Michael Lee	michael@example.com	1357924680	Male	Analyst	(link to photo)	password3	456-789-1230
4	Sarah Brown	sarah@example.com	2468013579	Female	Designer	(link to photo)	password4	789-123-4560
5	David Kim	david@example.com	3692581470	Male	Intern	(link to photo)	password5	321-654-9870

M_ID	Name	Email	Identification_ID	Gender	Designation	Photo	Password	Phone_No
1	John Smith	john@example.com	1234567890	Male	Manager	link_to_photo	password1	123-456-7890
2	Emily Jones	emily@example.com	987654321	Female	Developer	link_to_photo	password2	987-654-3210
3	Michael Lee	michael@example.com	1357924680	Male	Analyst	link_to_photo	password3	456-789-1230
4	Sarah Brown	sarah@example.com	2468013579	Female	Designer	link_to_photo	password4	789-123-4560
5	David Kim	david@example.com	3692581470	Male	Intern	link_to_photo	password5	321-654-9870
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

3. Populating the Instructors table

>> use test;
>> select * from instructors;

Attributes used: (I_ID, name, email, phone no., gender, Identification ID, type, S_ID(f), M_ID(f))

Note: Our populated table Student satisfies the ACID properties.

```sql
CREATE TABLE IF NOT EXISTS Instructors(
    I_ID INT NOT NULL,
    Name VARCHAR(255) NOT NULL,
    Email VARCHAR(255) NOT NULL,
    Phone_No VARCHAR(12) NOT NULL,
    Gender ENUM('Male', 'Female') NOT NULL,
    Identification_ID VARCHAR(9) NOT NULL,
    Type ENUM('Full', 'Part') NOT NULL,
    S_ID VARCHAR(4) NOT NULL,
    M_ID INT NOT NULL,
    PRIMARY KEY (I_ID)
);
```

```sql
INSERT INTO Instructors (I_ID, Name, Email, Phone_No, Gender, Identification_ID, Type, S_ID, M_ID) VALUES
(101, 'John Doe', 'johndoe@example.com', '123-456-789', 'Male', '123456789', 'Full', '0001', 1),
(102, 'Jane Smith', 'janesmith@example.com', '987-654-321', 'Female', '987654321', 'Part', '0007', 1),
(103, 'Alex Lee', 'alexlee@example.com', '456-789-012', 'Male', '456789012', 'Full', '0002', 1),
(104, 'Emily Chen', 'emilychen@example.com', '741-852-963', 'Female', '741852963', 'Full', '0003', 2),
(105, 'Mark Kim', 'markkim@example.com', '369-258-147', 'Male', '369258147', 'Part', '0010', 1);
```

3. Instructors table

I_ID	Name	Email	Phone No.	Gender	Identification ID	Type	S_ID (f)	M_ID (f)
101	John Doe	johndoe@example.com	123-456-789	Male	123456789	Full	0001	1
102	Jane Smith	janesmith@example.com	987-654-321	Female	987654321	Part	0007	1
103	Alex Lee	alexlee@example.com	456-789-012	Male	456789012	Full	0002	1
104	Emily Chen	emilychen@example.com	741-852-963	Female	741852963	Full	0003	2
105	Mark Kim	markkim@example.com	369-258-147	Male	369258147	Part	0010	1

I_ID	Name	Email	Phone_No	Gender	Identification_ID	Type	S_ID	M_ID
101	John Doe	johndoe@example.com	123-456-789	Male	123456789	Full	1	1
102	Jane Smith	janesmith@example.com	987-654-321	Female	987654321	Part	7	1
103	Alex Lee	alexlee@example.com	456-789-012	Male	456789012	Full	2	1
104	Emily Chen	emilychen@example.com	741-852-963	Female	741852963	Full	3	2
105	Mark Kim	markkim@example.com	369-258-147	Male	369258147	Part	10	1
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

4. Populating the Donation table

>> use test;

>> select * from Donation;

Attributes used: (D_ID, donor_name, amount, details, phone no., email)

Note: Our populated table Student satisfies the ACID properties

```
CREATE TABLE Donation (
    D_ID INT PRIMARY KEY,
    Donor_Name VARCHAR(255),
    Amount DECIMAL(10, 2),
    Details VARCHAR(255),
    Phone_No VARCHAR(15),
    Email VARCHAR(255)
);
```

```
INSERT INTO Donation (D_ID, Donor_Name, Amount, Details, Phone_No, Email) VALUES
(11, 'Joey Tribianni', 100, 'Transaction ID', '123-456-789', 'johntribianni@example.com'),
(12, 'Jane Smith', 250, 'Transaction ID', '987-654-321', 'janesmith@example.com'),
(23, 'Alice Lee', 50, 'Transaction ID', '555-123-456', 'alicelee@example.com'),
(54, 'Bob Johnson', 150, 'Transaction ID', '111-222-333', 'bobjohnson@example.com'),
(55, 'Sarah Brown', 75, 'Transaction ID', '444-555-666', 'sarahbrown@example.com');
```

4. Donation table

D_ID	Donor Name	Amount	Details	Phone No.	Email
11	Joey Tribianni	100	Transaction ID	123-456-789	johntribianni@example.com
12	Jane Smith	250	Transaction ID	987-654-321	janesmith@example.com
23	Alice Lee	50	Transaction ID	555-123-456	alicelee@example.com
54	Bob Johnson	150	Transaction ID	111-222-333	bobjohnson@example.com
55	Sarah Brown	75	Transaction ID	444-555-666	sarahbrown@example.com

D_ID	Donor_Name	Amount	Details	Phone_No	Email
11	Joey Tribianni	100	Transaction ID	123-456-789	johntribianni@example.com
12	Jane Smith	250	Transaction ID	987-654-321	janesmith@example.com
23	Alice Lee	50	Transaction ID	555-123-456	alicelee@example.com
54	Bob Johnson	150	Transaction ID	111-222-333	bobjohnson@example.com
55	Sarah Brown	75	Transaction ID	444-555-666	sarahbrown@example.com
NULL	NULL	NULL	NULL	NULL	NULL

5. Populating the Volunteer table

>> use test;
>> select * from Volunteer;

Attributes used: (V_ID, name, email, Identification ID, gender, photo, phone no., M_ID(f), address)

Note: Our populated table Student satisfies the ACID properties

```
CREATE TABLE Persons (
    V_ID INT AUTO_INCREMENT PRIMARY KEY,
    Name VARCHAR(255) NOT NULL,
    Email VARCHAR(255) NOT NULL,
    Identification_ID BIGINT NOT NULL,
    Gender ENUM('Male', 'Female') NOT NULL,
    Photo VARCHAR(255),
    Phone_No VARCHAR(20) NOT NULL,
    M_ID INT,
    Address VARCHAR(255),
    FOREIGN KEY (M_ID) REFERENCES Courses(C_ID)
);
```

```
INSERT INTO Members (Name, Email, Identification_ID, Gender, Photo, Phone_No, V_ID, Address) VALUES
('Steve Smith', 'steve@example.com', '123456789', 'Male', '[Link]', '123-456-789', 1, '123 Main St, City'),
('Emily Johnson', 'emily@example.com', '987654321', 'Female', '[Link]', '987-654-321', 2, '456 Oak Ave, Town'),
('Michael Brown', 'michael@example.com', '567890123', 'Male', '[Link]', '567-890-123', 1, '789 Elm St, Village'),
('Sarah Davis', 'sarah@example.com', '456789012', 'Female', '[Link]', '456-789-012', 4, '321 Pine St, County'),
('David Wilson', 'david@example.com', '234567890', 'Male', '[Link]', '234-567-890', 1, '654 Maple Dr, Township');
```

5. Volunteer table

V_ID	Name	Email	Identification ID	Gender	Photo	Phone No.	M_ID (f)	Address
1	steve Smith	steve@example.com	123456789	Male	[Link]	123-456-789	1	123 Main St, City
2	Emily Johnson	emily@example.com	987654321	Female	[Link]	987-654-321	2	456 Oak Ave, Town
3	Michael Brown	michael@example.com	567890123	Male	[Link]	567-890-123	1	789 Elm St, Village
4	Sarah Davis	sarah@example.com	456789012	Female	[Link]	456-789-012	4	321 Pine St, County
5	David Wilson	david@example.com	234567890	Male	[Link]	234-567-890	1	654 Maple Dr, Township

V_ID	Name	Email	Identification_ID	Gender	Photo	Phone_No	M_ID	Address
1	Steve Smith	steve@example.com	123456789	Male	[Link]	123-456-789	1	123 Main St, City
2	Emily Johnson	emily@example.com	987654321	Female	[Link]	987-654-321	2	456 Oak Ave, Town
3	Michael Brown	michael@example.com	567890123	Male	[Link]	567-890-123	1	789 Elm St, Village
4	Sarah Davis	sarah@example.com	456789012	Female	[Link]	456-789-012	4	321 Pine St, County
5	David Wilson	david@example.com	234567890	Male	[Link]	234-567-890	1	654 Maple Dr, Township
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

6. Populating the Admin table

>> use test;
>> select * from Admin;

Attributes used: (AD_ID, email, name, password)

Note: Our populated table Student satisfies the ACID properties

```
CREATE TABLE Admin (
    AD_ID INT AUTO_INCREMENT PRIMARY KEY,
    Email VARCHAR(255) NOT NULL,
    Name VARCHAR(255) NOT NULL,
    Password VARCHAR(255) NOT NULL
);
```

```
INSERT INTO Admin (Email, Name, Password)
VALUES ('admin1@example.com', 'John Doe', 'johndoe123');
```

6. Admin Table

AD_ID	Email	Name	Password
1	admin1@example.com	John Doe	johndoe123

AD_ID	Email	Name	Password
1	admin1@example.com	John Doe	johndoe123
NULL	NULL	NULL	NULL

7. Populating the course table

>> use test;
>> select * from Course;

Attributes used: (C_ID, Course_name, Details, Venue)

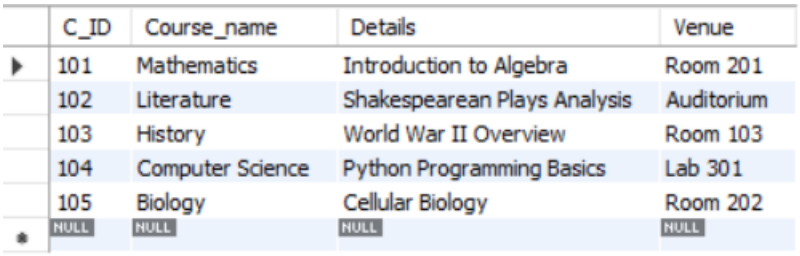
Note: Our populated table Student satisfies the ACID properties

```
CREATE TABLE Course (
    C_ID INT PRIMARY KEY,
    Course_name VARCHAR(255),
    Details VARCHAR(255),
    Venue VARCHAR(255)
);
```

```
INSERT INTO Course (C_ID, Course_name, Details, Venue) VALUES
(101, 'Mathematics', 'Introduction to Algebra', 'Room 201'),
(102, 'Literature', 'Shakespearean Plays Analysis', 'Auditorium'),
(103, 'History', 'World War II Overview', 'Room 103'),
(104, 'Computer Science', 'Python Programming Basics', 'Lab 301'),
(105, 'Biology', 'Cellular Biology', 'Room 202');
```

7. Course table

C_ID	Course_name	Details	Venue
101	Mathematics	Introduction to Algebra	Room 201
102	Literature	Shakespearean Plays Analysis	Auditorium
103	History	World War II Overview	Room 103
104	Computer Science	Python Programming Basics	Lab 301
105	Biology	Cellular Biology	Room 202



C_ID	Course_name	Details	Venue
101	Mathematics	Introduction to Algebra	Room 201
102	Literature	Shakespearean Plays Analysis	Auditorium
103	History	World War II Overview	Room 103
104	Computer Science	Python Programming Basics	Lab 301
105	Biology	Cellular Biology	Room 202
NULL	NULL	NULL	NULL

Question 2

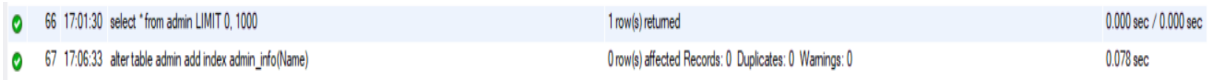
Please explain and implement the indexing over one of the columns (where the search needs to be optimized), user-defined data types, and table extensions.

- Indexing

1. Admin:

An index was created named admin_info. It was indexed over one column of the Admin table. The below are the edited query code of question G1Q1 (same applied to all the tables) action output to the following code. The optimization may happen by creating the index by fraction seconds.

```
1 •    select * from admin;
2
3 •    alter table admin add index admin_info(Name);
```



2. Course:

An index was created named course_info. It was indexed over two columns of the Course table in which C_ID is primary key.

```
5 •    select * from course;
6
7 •    alter table course add index course_info(C_ID,Course_name);
```

3.Donation:

An index was created named donation_info. It was indexed over two columns of the Course table in which D_ID is primary key.

```
9 •    select * from donation;
10
11 •   alter table donation add index donation_info(D_ID,Donor_Name);
```

4. Instructors:

An index was created named instructors_info. It was indexed over two columns of the Instructor table in which I_ID is primary key.

```
13 •    select * from instructors;
14
15 •    alter table instructors add index instructors_info(I_ID,Name);
```

72	17:21:19	select * from instructors LIMIT 0, 1000	0 row(s) returned
73	17:23:26	alter table instructors add index instructors_info(I_ID,Name)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0

5. neev_members:

An index was created named neev_members_info. It was indexed over two columns of the neev_members table in which M_ID is primary key.

```
17 •    select * from neev_members;
18
19 •    alter table neev_members add index neev_members_info(M_ID,Name);
20
```

74	17:25:10	select * from neev_members LIMIT 0, 1000	5 row(s) returned
75	17:25:26	alter table neev_members add index neev_members_info(M_ID,Name)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0

6. Students:

An index was created named students_info. It was indexed over two columns of the students table in which S_ID is a primary key.

```
21 •    select * from students;
22
23 •    alter table students add index students_info(S_ID,Name);
```

76	17:26:49	select * from students LIMIT 0, 1000	10 row(s) returned
77	17:27:46	alter table students add index students_info(S_ID,Name)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0

7.Volunteer :

An index was created named volunteer_info. It was indexed over two columns of the volunteer table in which V_ID is primary key.

```
25 •    select * from volunteer;
26
27 •    alter table volunteer add index volunteer_info(V_ID,Name);
```

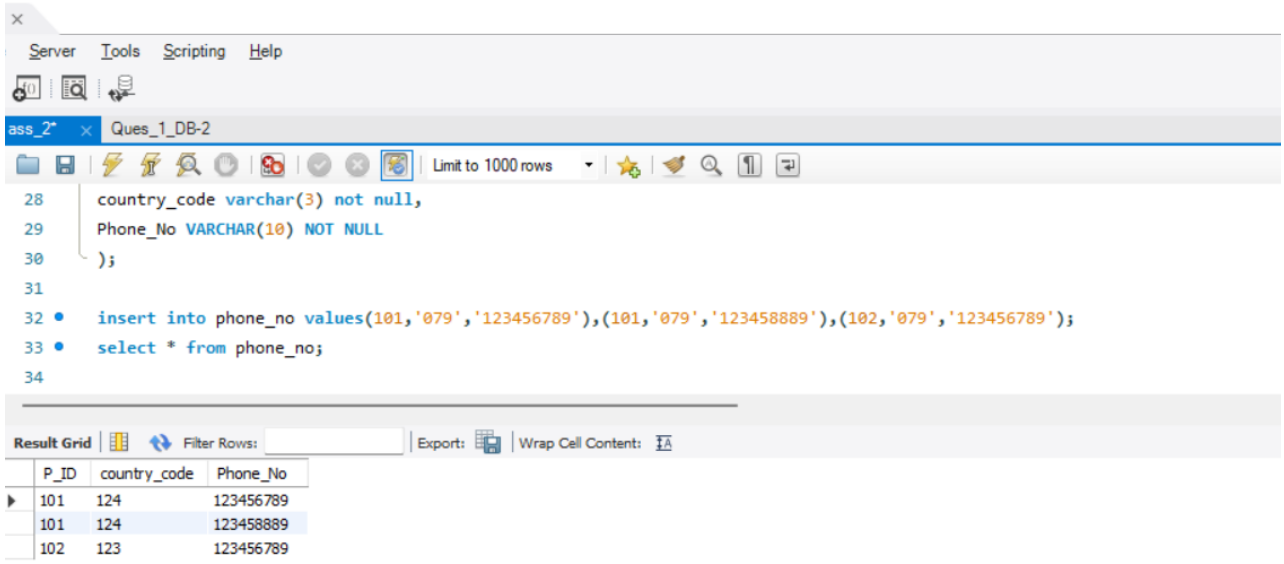
- User-defined data types:

78	17:29:00	select * from volunteer LIMIT 0, 1000	5 row(s) returned
79	17:29:30	alter table volunteer add index volunteer_info(V_ID,Name)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0

Here we implemented user-defined data type phone_no which has 2 fields , phone no and country code and p_id which stores the id of the person whose phone no is to stored.

The MySQL query for this:

```
24
25    #user defined data type phone_no which stores the code,nd number
26    create table phone_no(
27    P_ID INT NOT NULL,
28    country_code varchar(3) not null,
29    Phone_No VARCHAR(10) NOT NULL
30    );
31
32    insert into phone_no values(101,'079','123456789'),(101,'079','123458889'),(102,'079','123456789');
33    select * from phone_no;
34
35
```



- Table Extension

MySQL has an extension for the CREATE TABLE clause that can be used to generate a new table with the same schema as an existing table in the database. This is typically used to temporarily store the output of complex queries in a new table. The resulting table has identical column names and data types as the original table.

Here we implemented the table extension over volunteer. Our extension creates new table having three attributes from the table volunteer.

Separate table to of volunteers.

```
CREATE TABLE extendeds_table AS
SELECT V_id, Name, Gender
FROM volunteer;

select * from extendeds_table;
```

V_id	Name	Gender
1	Steve Smith	Male
2	Emily Johnson	Female
3	Michael Brown	Male
4	Sarah Davis	Female
5	David Wilson	Male

```
45  19:16:42  CREATE TABLE extendeds_table AS SELECT V_id, Name, Gender FROM volunteer
```

5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0

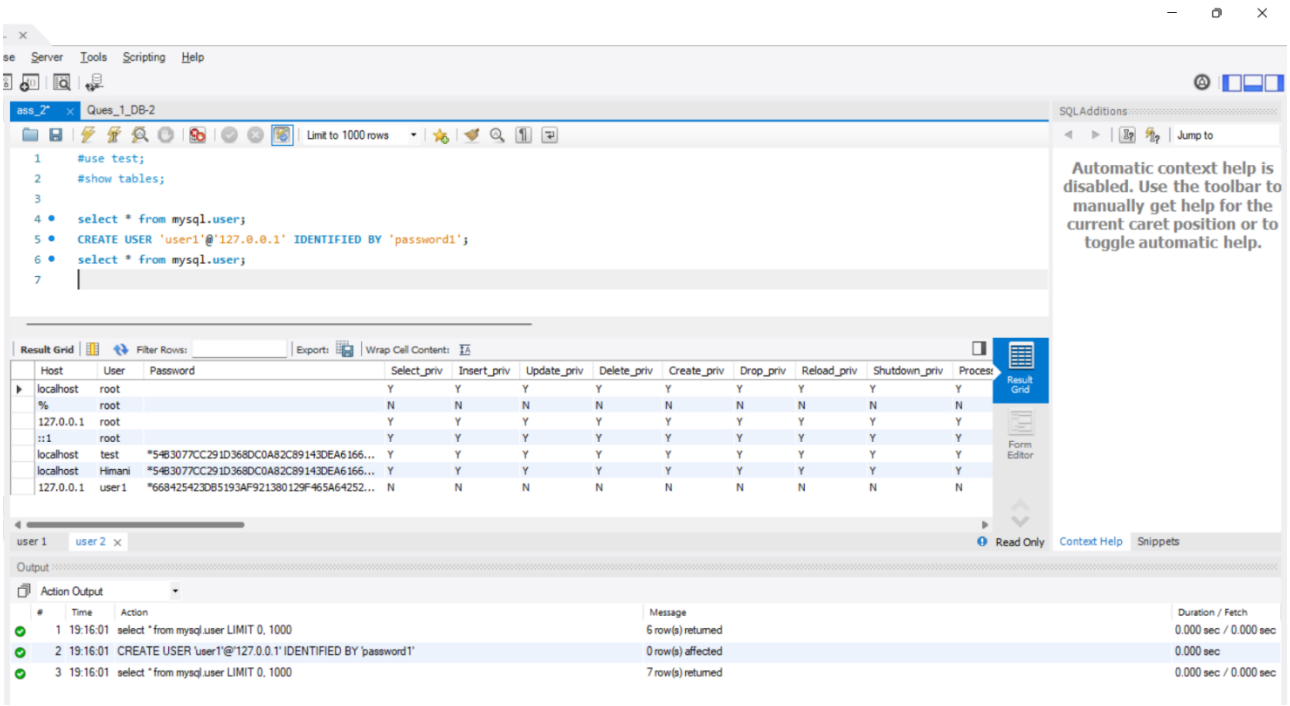
Responsibility of G2:

Question 3

To demonstrate the process of creating a user, granting different permissions on tables and views, and revoking the permissions in a database management system. You are supposed to use the database created by the G1.

1. Create a user named "user1" with the password "password1". 1 x 1 = 1 Pts

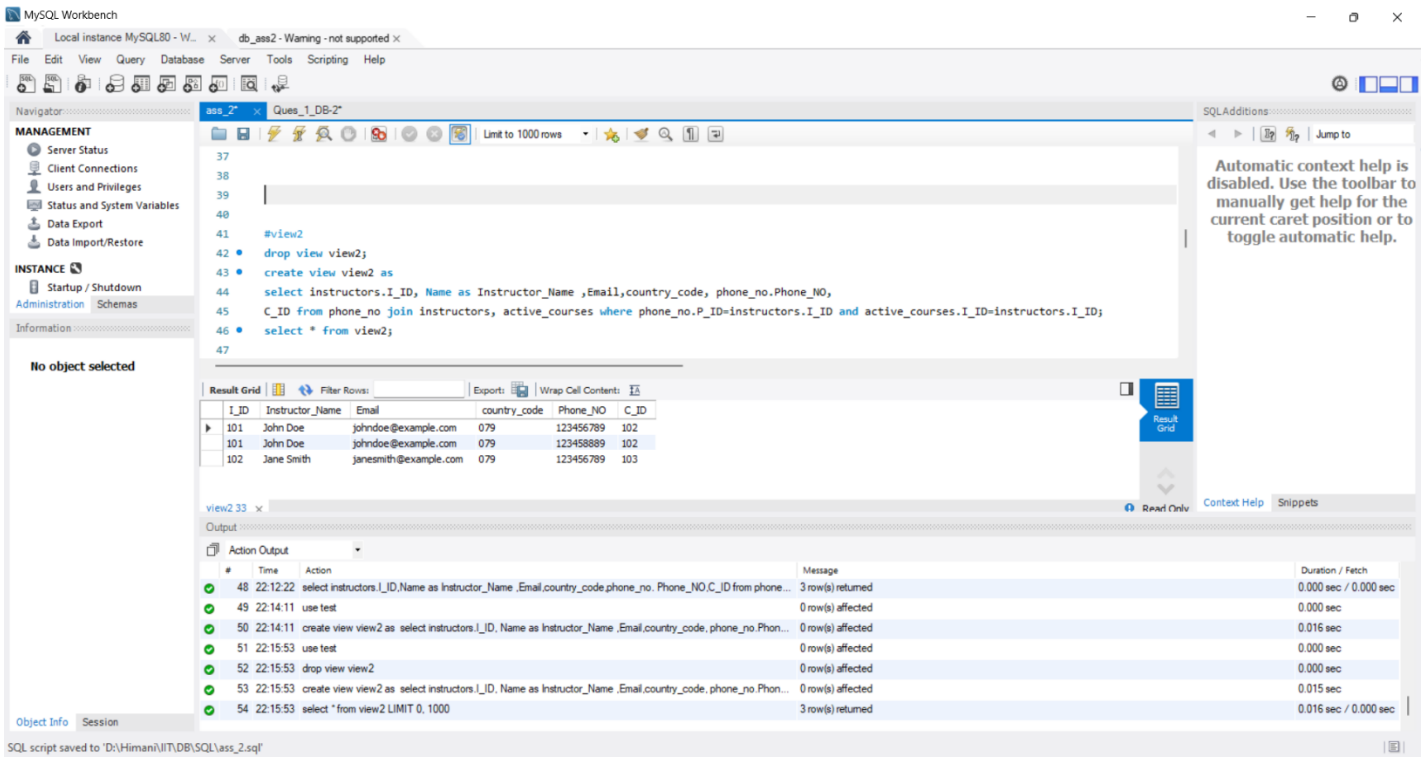
```
CREATE USER 'user1'@'127.0.0.1' IDENTIFIED BY 'password1';
select * from mysql.user;
```



2. Create Views on any of the two tables formed by G1 as view1 and view2. And make sure that views contain columns from at least two tables and one additional column with the user-defined data type. 6 x 1 = 6 Pts

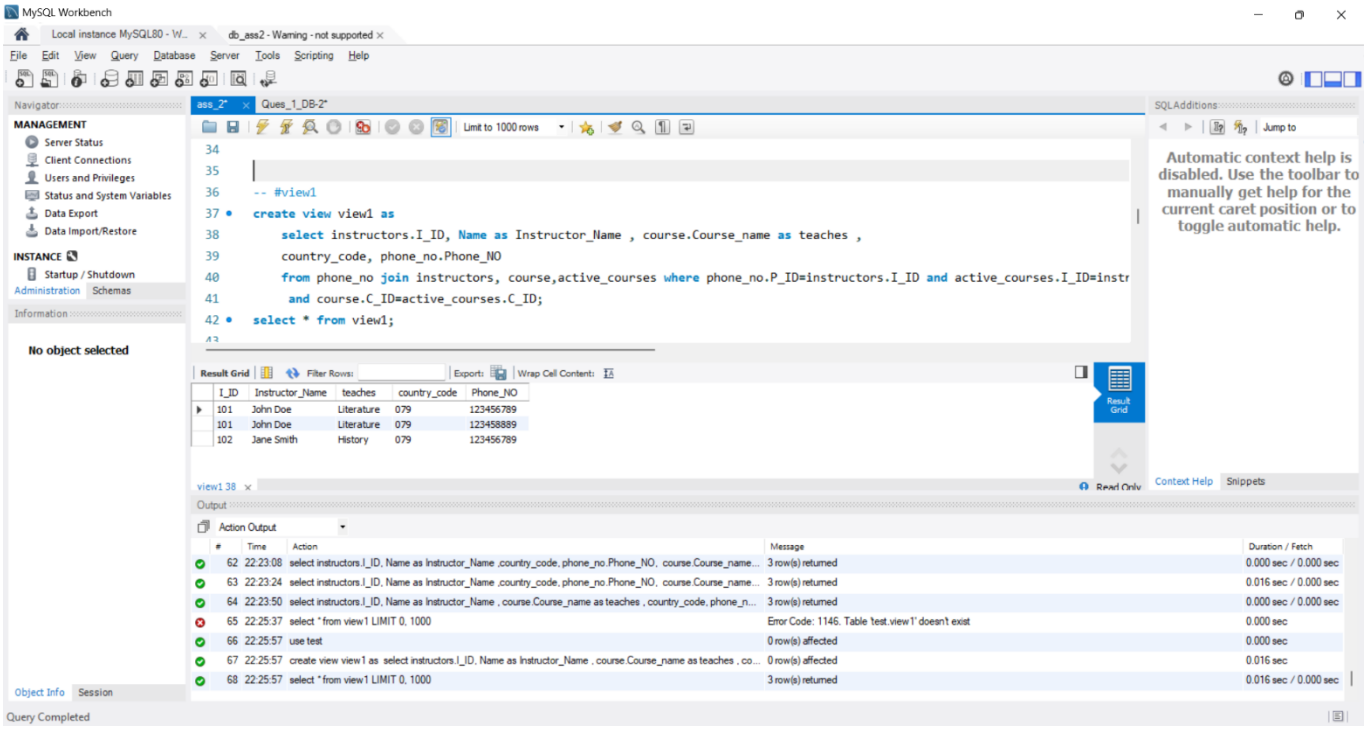
```
create view view2 as
select instructors.I_ID, Name as Instructor_Name ,Email,country_code, phone_no.Phone_NO,
C_ID from phone_no join instructors, active_courses where phone_no.P_ID=instructors.I_ID and
active_courses.I_ID=instructors.I_ID;
```

- Phone_no is user defined data type which stores the phone no of each person with it's country code.

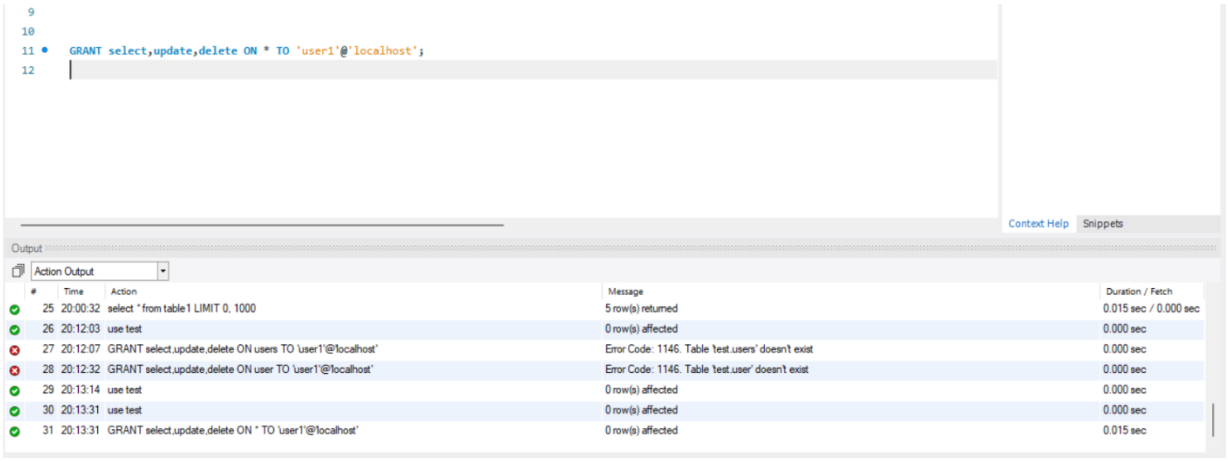


- Instructors and active_courses are 2 tables from which view is created.

```
create view view1 as
        select instructors.I_ID, Name as Instructor_Name , course.Course_name as teaches ,
        country_code, phone_no.Phone_NO
        from phone_no join instructors, course,active_courses where phone_no.P_ID=instructors.I_ID
and active_courses.I_ID=instructors.I_ID
         and course.C_ID=active_courses.C_ID;
select * from view1;
```


MySQL Workbench
Local instance MySQL80 - W...
db_ass2 - Warning - not supported
File Edit View Query Database Server Tools Scripting Help
Navigator
MANAGEMENT
Server Status
Client Connections
Users and Privileges
Status and System Variables
Data Export
Data Import/Restore
INSTANCE
Startup / Shutdown
Administration Schemas
Information
No object selected
Object Info Session
ass_2*
Ques_1_DB-2*
Limit to 1000 rows
34
35
36 -- #view1
37 • create view view1 as
38 select instructors.I_ID, Name as Instructor_Name , course.Course_name as teaches ,
39 country_code, phone_no.Phone_NO
40 from phone_no join instructors, course,active_courses where phone_no.P_ID=instructors.I_ID and active_courses.I_ID=instr
41 and course.C_ID=active_courses.C_ID;
42 • select * from view1;
Result Grid
Filter Rows:
Export:
Wrap Cell Content:
I_ID Instructor_Name teaches country_code Phone_NO
101 John Doe Literature 079 123456789
101 John Doe Literature 079 123458889
102 Jane Smith History 079 123456789
Result Grid
Read Only
view1 38
SQLAdditions
Jump to
Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.
Context Help Snippets
Output
Action Output
Time Action Message Duration / Fetch
62 22:23:08 select instructors.I_ID, Name as Instructor_Name ,country_code, phone_no.Phone_NO, course.Course_name... 3 row(s) returned 0.000 sec / 0.000 sec
63 22:23:24 select instructors.I_ID, Name as Instructor_Name ,country_code, phone_no.Phone_NO, course.Course_name... 3 row(s) returned 0.016 sec / 0.000 sec
64 22:23:50 select instructors.I_ID, Name as Instructor_Name , course.Course_name as teaches , country_code, phone_n... 3 row(s) returned 0.000 sec / 0.000 sec
65 22:25:37 select * from view1 LIMIT 0, 1000 Error Code: 1146. Table 'test.view1' doesn't exist 0.000 sec
66 22:25:57 use test 0 row(s) affected 0.000 sec
67 22:25:57 create view view1 as select instructors.I_ID, Name as Instructor_Name , course.Course_name as teaches , co... 0 row(s) affected 0.016 sec
68 22:25:57 select * from view1 LIMIT 0, 1000 3 row(s) returned 0.016 sec / 0.000 sec
Query Completed

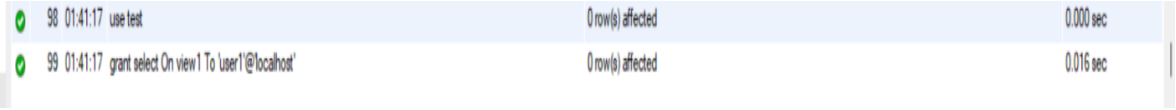
3. Grant "user1" the following permissions on "table1":
    - SELECT
    - UPDATE
    - DELETE



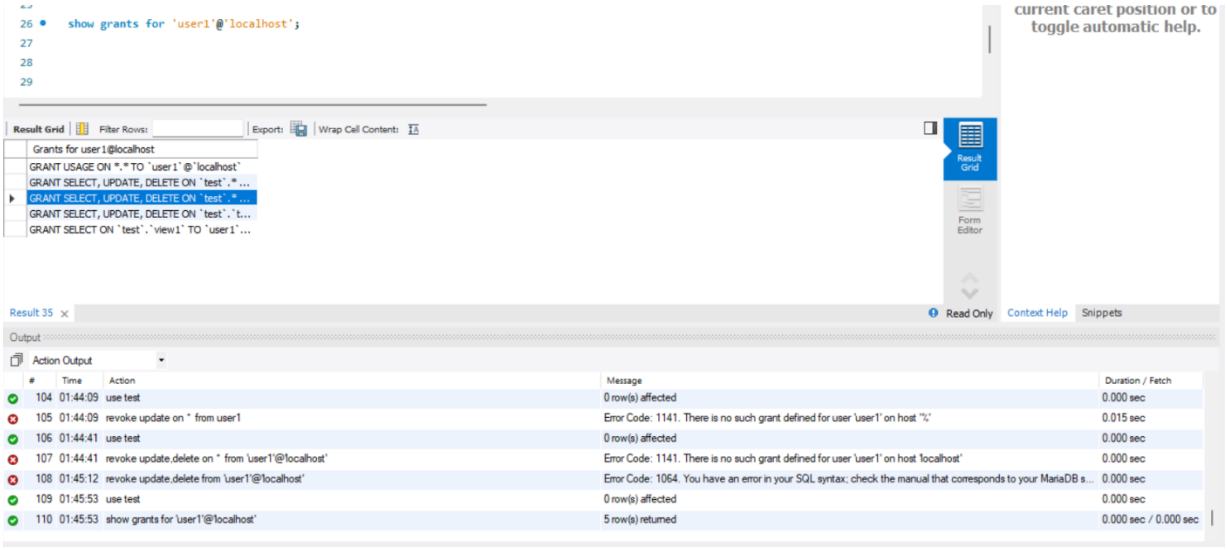
4. Grant "user1" the following permissions on "view1": 2 x 1 = 2 Pts

- SELECT

```
grant select On view1 To 'user1'@'localhost';
```

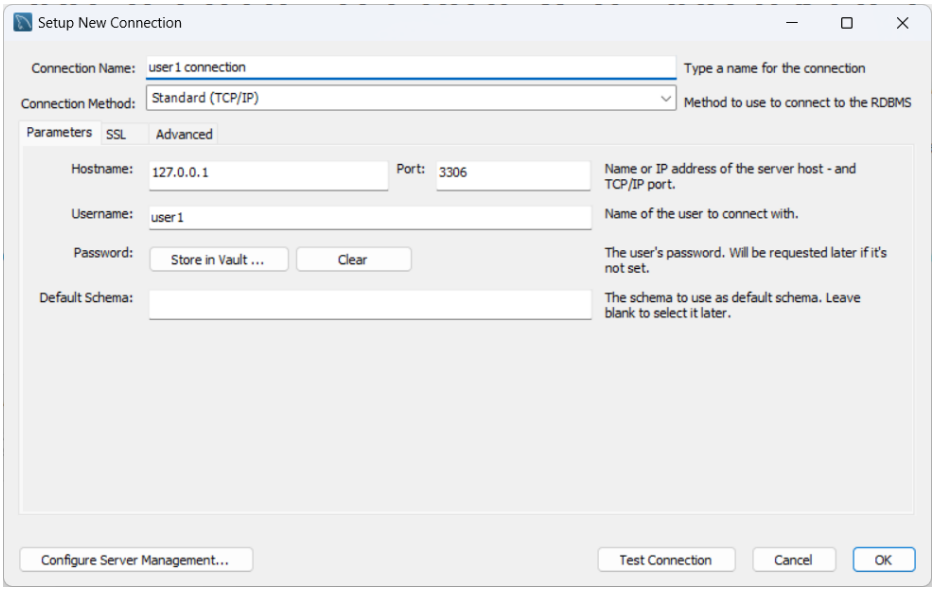



```
show grants for 'user1'@'localhost';
```



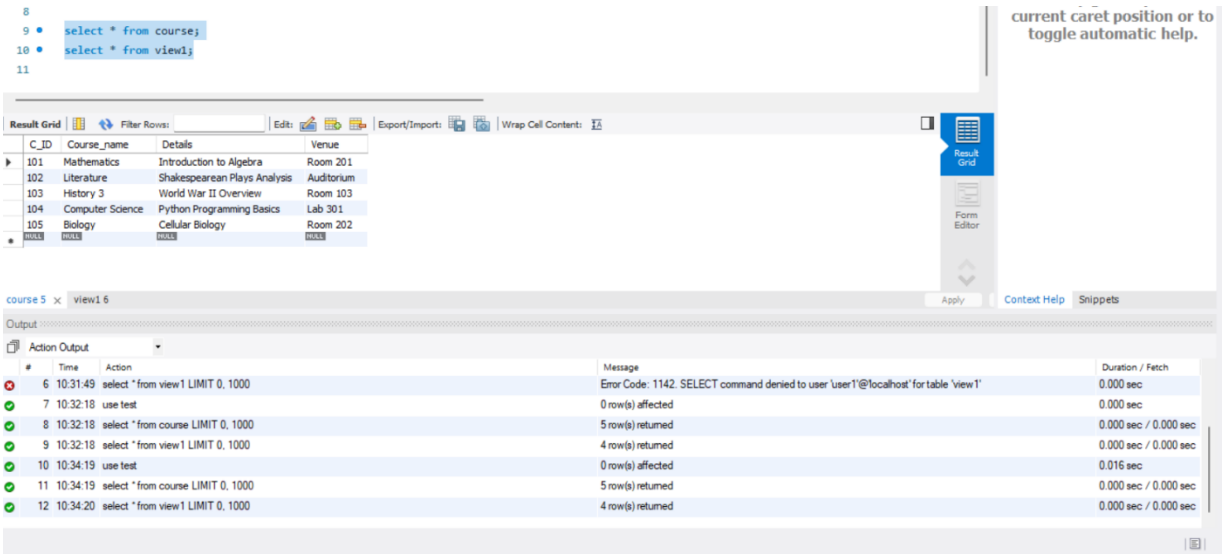
5. Try to perform SELECT, UPDATE, and DELETE operations on "table1" and "view1" as "user1" and report your findings. 6 x 1 = 6 Pts

- I have taken “table1” as “course” table for this question.
- Connected as user1:

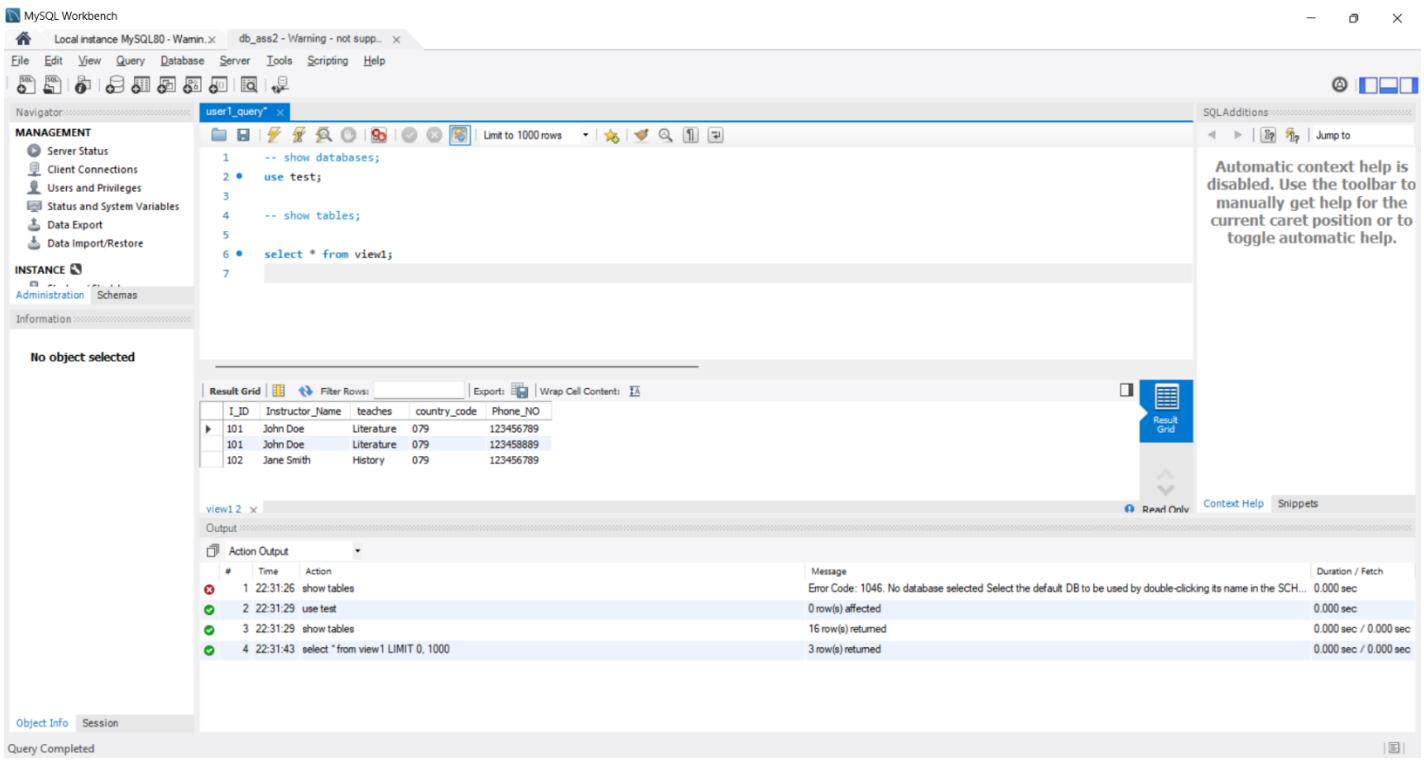


- Select:

select * from course;

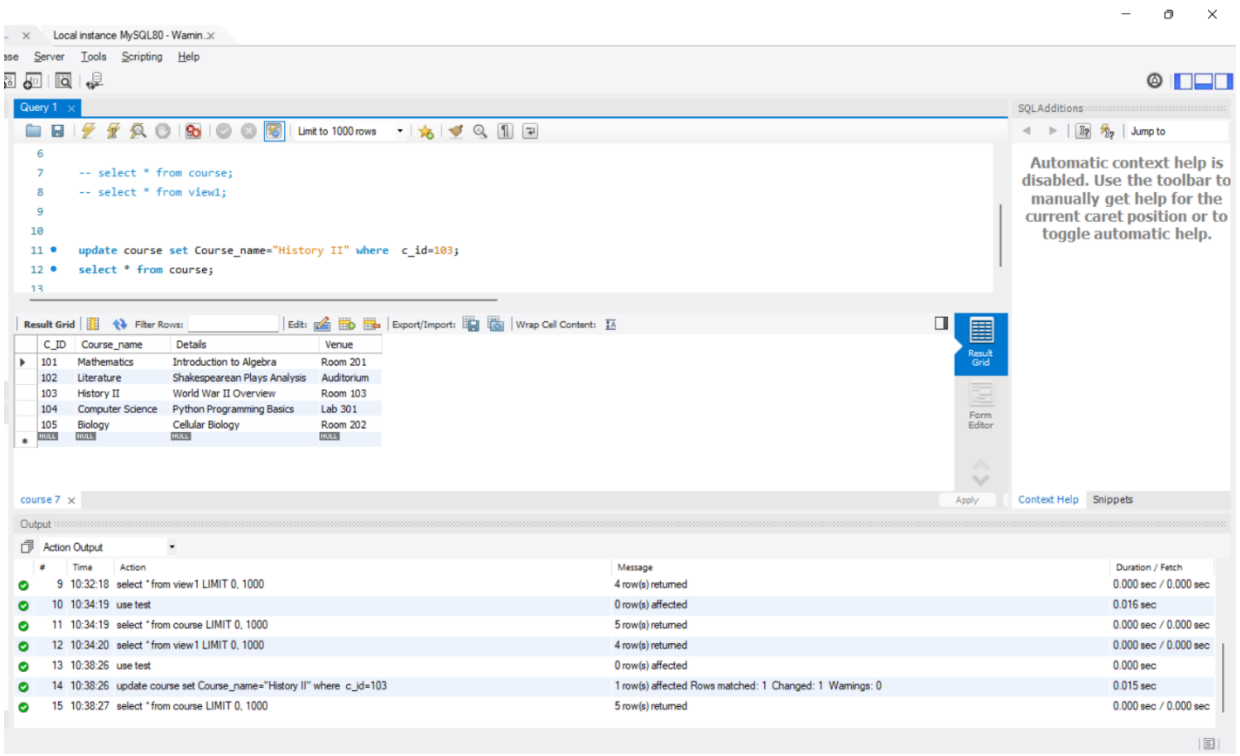


select * from view1;



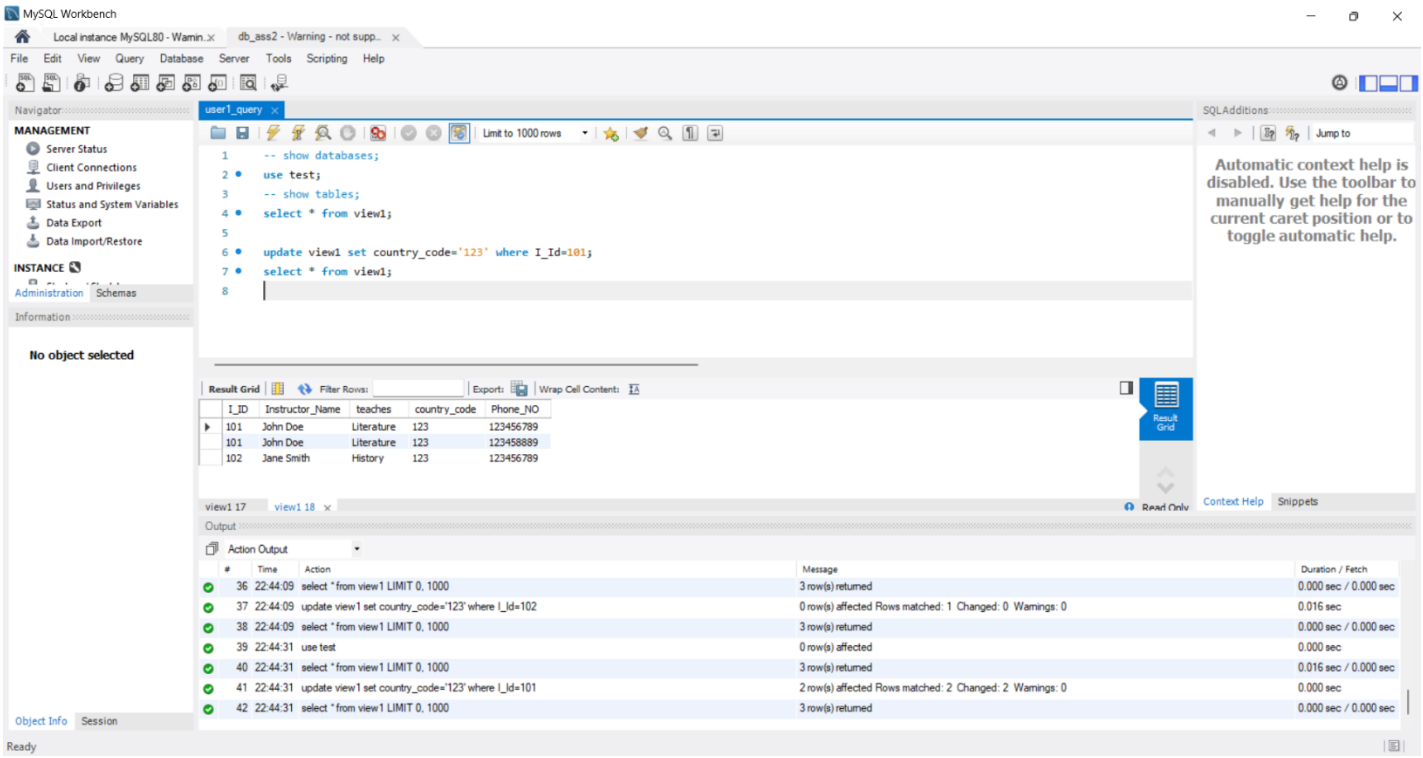
- Update:

```
update course set Course_name="History II" where  c_id=103;
select * from course;
```



```
update view1 set country_code='123' where I_Id=101;
select * from view1;
```

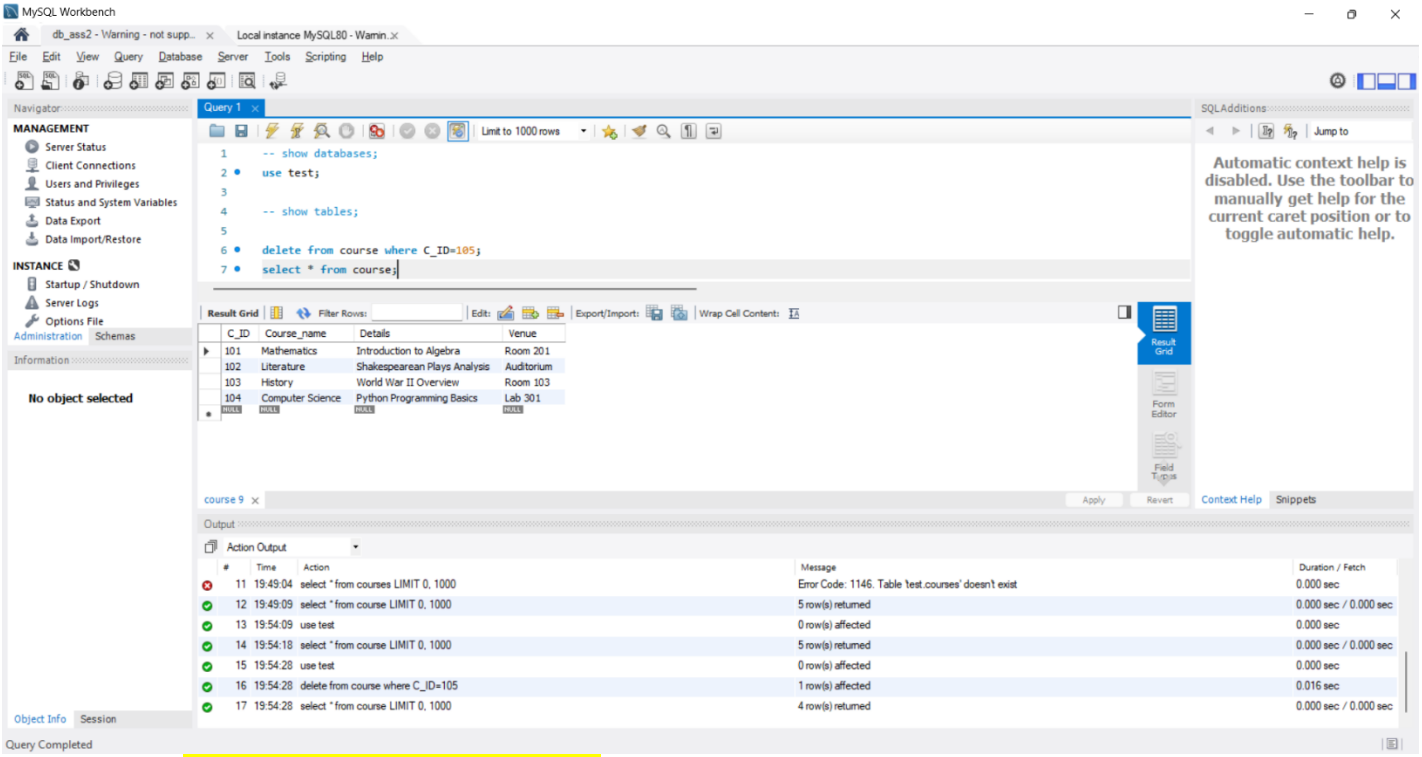
- This will update the view only not the base table.



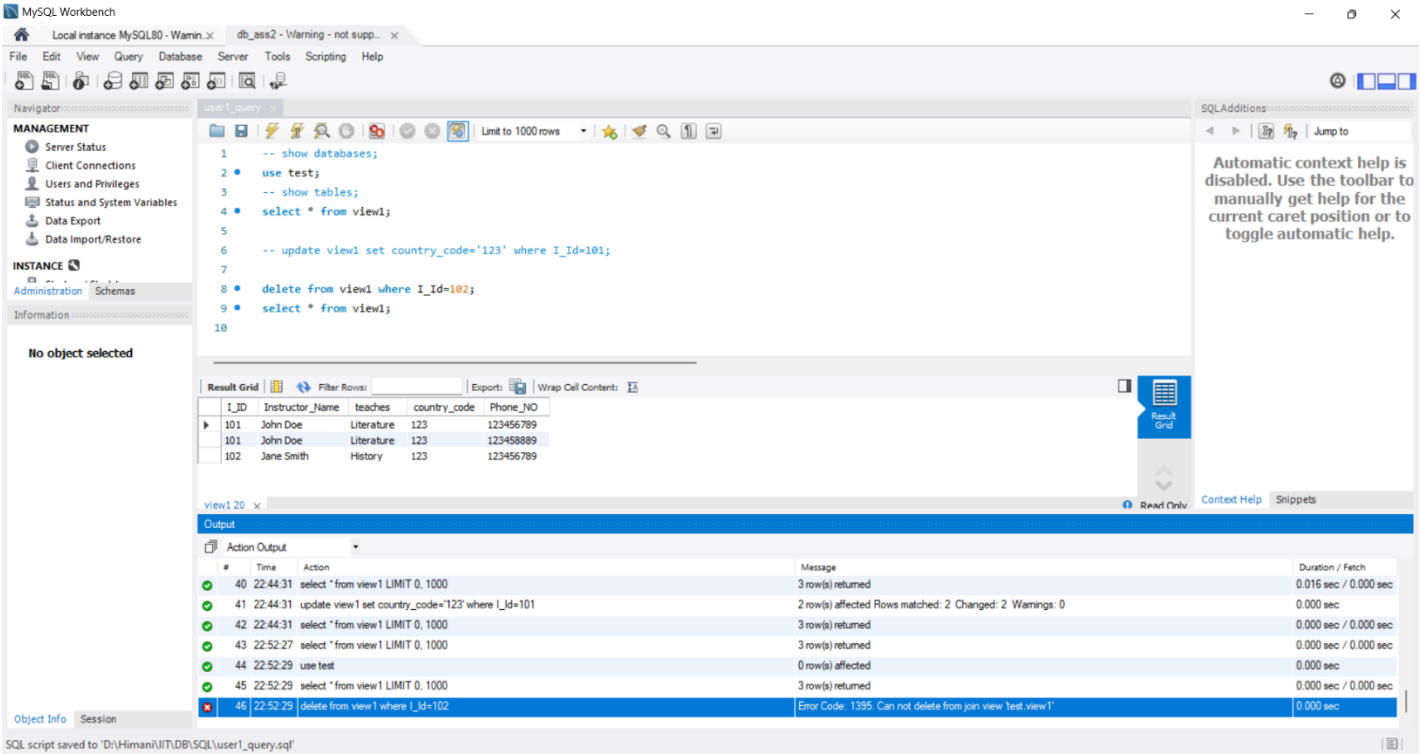
- Delete:

```
delete from course where C_ID=105;
```

select * from course;



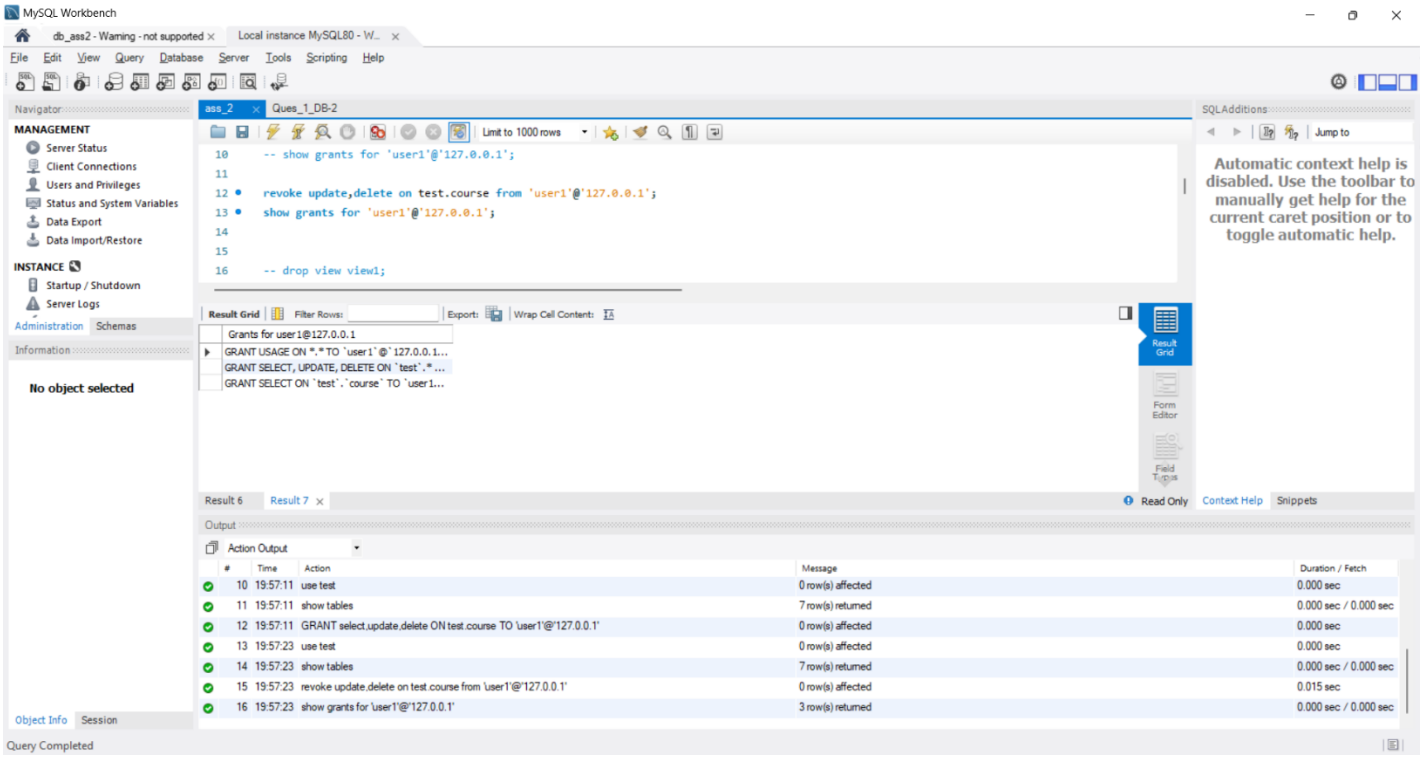
delete from view1 where I_Id=102;
select * from view1;



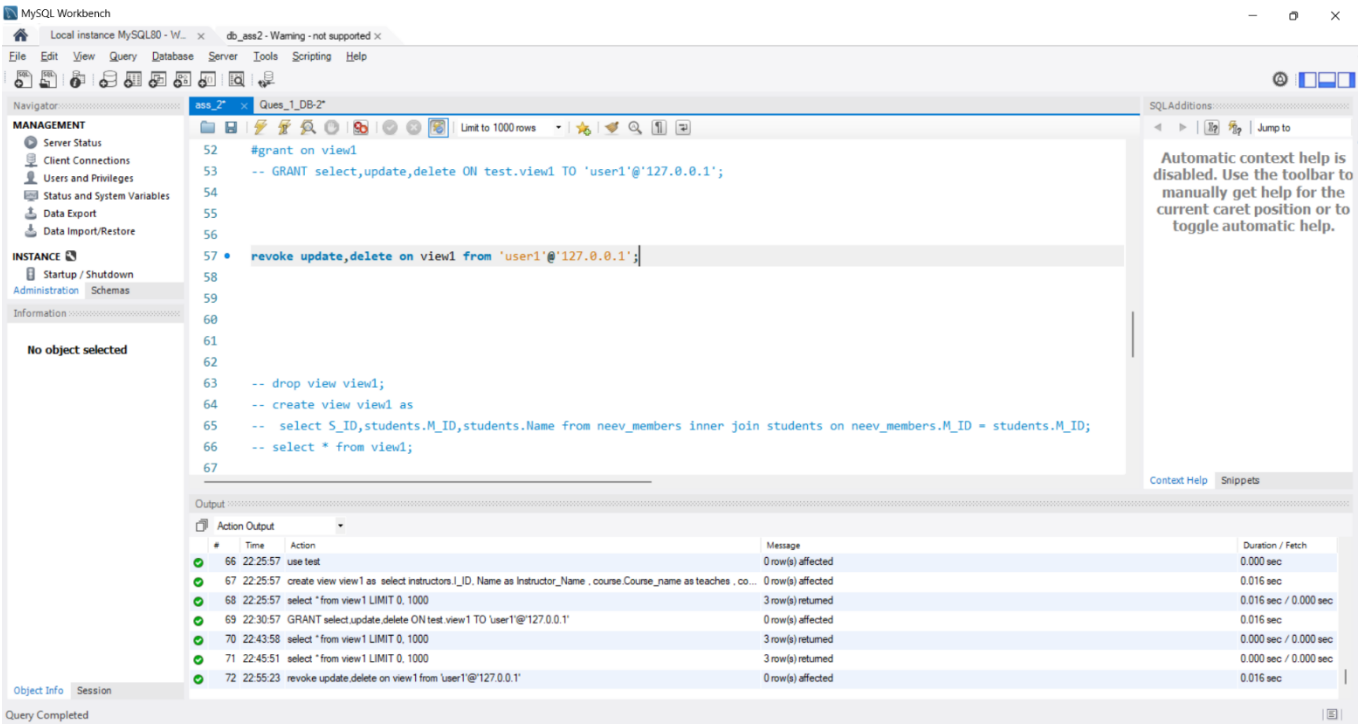
6. Revoke the UPDATE and DELETE permissions on "table1" for "user1" and report your findings. 4 x 1 = 4 Pts

- Again connected to root account and revoke the permissions:
- After revoking, user1 is not able to make changes to the table course and view1.

```
revoke update,delete on test.course from 'user1'@'127.0.0.1';
show grants for 'user1'@'127.0.0.1';
```

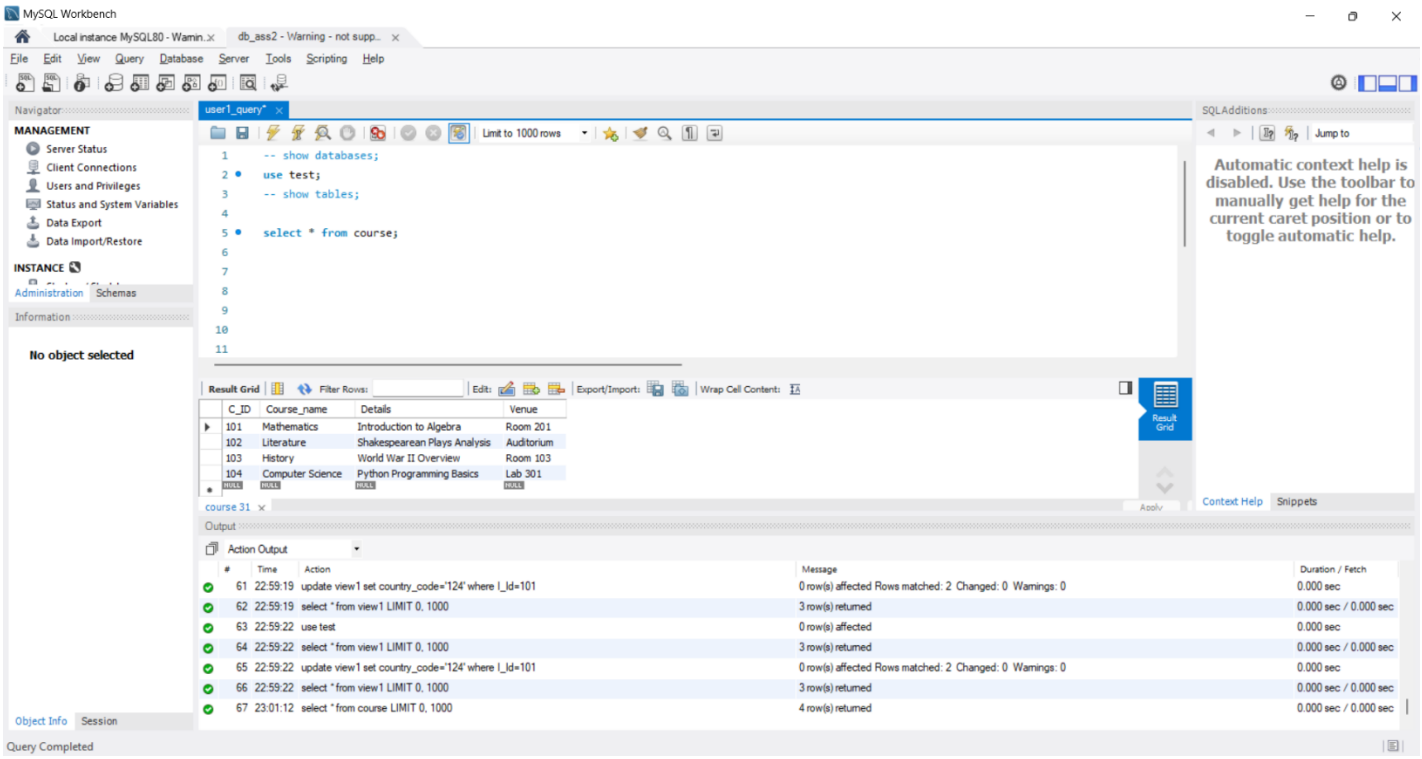


revoke update,delete on view1 from 'user1'@'127.0.0.1';

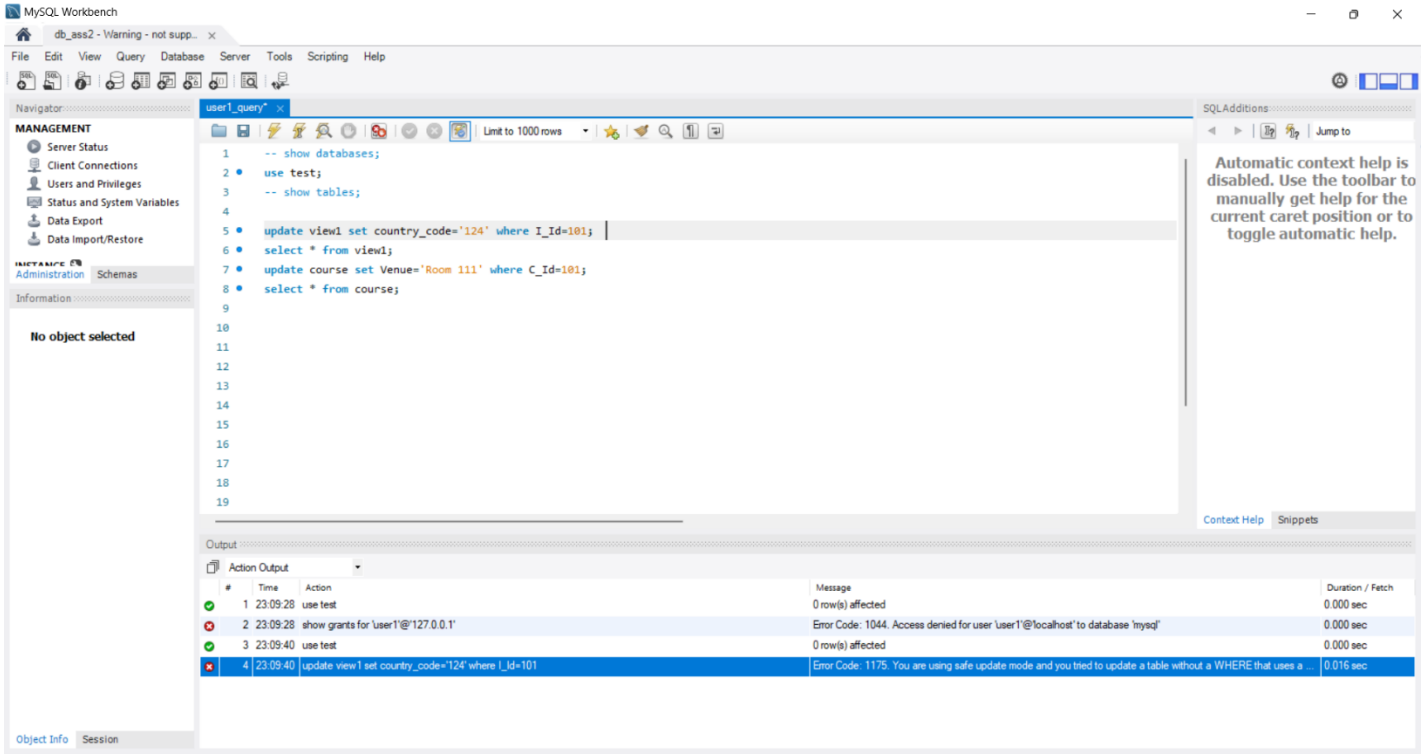


7. Try to perform SELECT, UPDATE, and DELETE operations on "table1" and "view1" as "user1" again. 3 x 1 = 3 Pts

- Select:



- update:



- Delete:

Question 2

Mention the situation that violates the referential integrity, show the updates in the table, and how we can solve such problems.

Here in our NEEV system, we have certain referential keys like S_ID in the student_course, instructors table, M_ID in the Volunteer table, C_ID in the student_course, active_courses and Volunteeer_course,I_ID in the active_courses, AD_ID in the funds, V_ID in the volunteer_courses.

A database error will be occurred here because there are certain column that is referenced by other tables through referential integrity constraints. As a result, it is not possible to update or delete rows from the tables that are referenced by the other tables, as it would violate the constraints.

So, to get rid of the problem we use the below given script to fetch/update the records without violating the referential integrity problems. The above SQL statements adds a rule to the Student_course table. This rule ensures that whenever we add a new row to Student_course, the value in the S_ID column must already exist in the Student table's S_ID column.The ON DELETE CASCADE part means that if we delete a student record from the Student table, all corresponding rows in the Student_course table will also be deleted.

Similarly, ON UPDATE CASCADE means that if we change a student's ID in the Student table, all related records in the Student_course table will also have their student IDs updated to match. Overall, this rule keeps things tidy and ensures that every S_ID in Student_course points to a valid student in the Student table.

```
-- Student_course
ALTER TABLE `Student_course`
ADD CONSTRAINT `fk_student_course_student`
FOREIGN KEY (`S_ID`)
REFERENCES `Students` (`S_ID`)
ON DELETE CASCADE
ON UPDATE CASCADE;
```

Output:

SHOW TABLES	11 row(s) returned
ALTER TABLE `Student_course` ADD CONSTRAINT `fk_student_course_student` FOREIGN KEY (`S_ID`) R...	2 row(s) affected Records: 2 Duplicates: 0 Warnings: 0

Here,we will do the same for as the above query by taking every individual schema into account and apply same kind of the query to make sure no violation happens.

```
ALTER TABLE `Student_course`
ADD CONSTRAINT `fk_student_course_course`
FOREIGN KEY (`C_ID`)
REFERENCES `Course` (`C_ID`)
ON DELETE CASCADE
ON UPDATE CASCADE;
```

Output:

```
ALTER TABLE `Student_course` ADD CONSTRAINT `fk_student_course_course` FOREIGN KEY (`C_ID`) RE... 2 row(s) affected Records: 2  Duplicates: 0  Warnings: 0
```

```
-- Active_courses
ALTER TABLE `Active_courses`
ADD CONSTRAINT `fk_active_courses_course`
FOREIGN KEY (`C_ID`)
REFERENCES `Course` (`C_ID`)
ON DELETE CASCADE
ON UPDATE CASCADE;
```

Output:

```
ALTER TABLE `Active_courses` ADD CONSTRAINT `fk_active_courses_course` FOREIGN KEY (`C_ID`) RE... 2 row(s) affected Records: 2  Duplicates: 0  Warnings: 0
```

```
-- Active_courses
ALTER TABLE `Active_courses`
ADD CONSTRAINT `fk_active_courses_instructor`
FOREIGN KEY (`I_ID`)
REFERENCES `Instructors` (`I_ID`)
ON DELETE CASCADE
ON UPDATE CASCADE;
```

Output:

Here, we can also have instructors table depended on both S_ID and M_ID, the below given case is for the case where the foreign key is taken as S_ID.

```
-- Instructors

ALTER TABLE `Instructors`
ADD CONSTRAINT `fk_instructor_student`
FOREIGN KEY (`S_ID`)
REFERENCES `Students` (`S_ID`)
ON DELETE CASCADE
ON UPDATE CASCADE;
```

Output:

```
-- Volunteer

ALTER TABLE `Volunteer`
ADD CONSTRAINT `fk_volunteer_member`
FOREIGN KEY (`M_ID`)
REFERENCES `NEEV_Members` (`M_ID`)
ON DELETE CASCADE
ON UPDATE CASCADE;
```

Output:

```
ALTER TABLE 'Volunteer' ADD CONSTRAINT 'fk_volunteer_member' FOREIGN KEY ('M_ID') REFERENCE...  5 row(s) affected Records: 5  Duplicates: 0  Warnings: 0
```

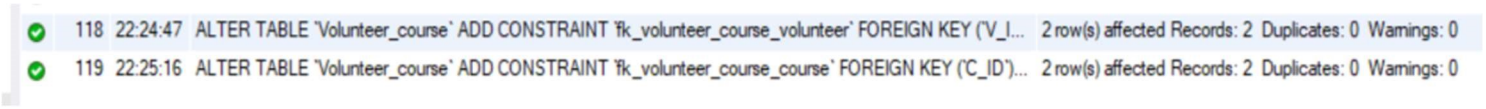
```
-- Volunteer_course

ALTER TABLE `Volunteer_course`
ADD CONSTRAINT `fk_volunteer_course_volunteer`
FOREIGN KEY (`V_ID`)
REFERENCES `Volunteer` (`V_ID`)
ON DELETE CASCADE
ON UPDATE CASCADE;
```

```
-- Volunteer_course

ALTER TABLE `Volunteer_course`
ADD CONSTRAINT `fk_volunteer_course_course`
FOREIGN KEY (`C_ID`)
REFERENCES `Course` (`C_ID`)
ON DELETE CASCADE
ON UPDATE CASCADE;
```

Output:




```
-- Funds
ALTER TABLE `Funds`
ADD CONSTRAINT `fk_funds_admin`
FOREIGN KEY (`AD_ID`)
REFERENCES `Admin` (`AD_ID`)
ON DELETE CASCADE
ON UPDATE CASCADE;
```

Output:

3.3 Responsibility of G1 & G2:

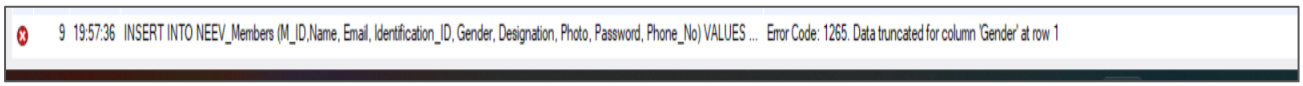
Using the optimized ER diagram, write **five** operations, their corresponding **nested** SQL queries, and tuple relational calculus/relational algebra with the following specifications:

1. Two queries must throw an error due to violation of constraints specified by **G1**.

Let the five operations be denoted by F1,F2,F3,F4 and F5.

F1:

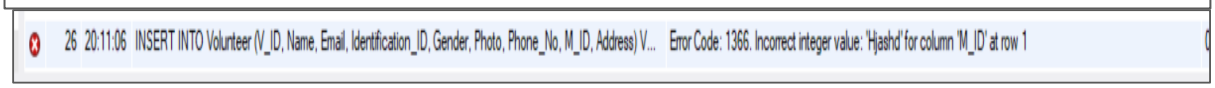
```
INSERT INTO NEEV_Members (M_ID,Name, Email, Identification_ID, Gender, Designation, Photo, Password, Phone_No)
VALUES
    (89,'John Smith', 'john@example.com', 1234567890, 'other', 'Manager', 'link_to_photo', 'password1', '123-456-7890')
```



This error occurs because we had specified a constraint for Gender in the table NEEV_Members, i.e. it can either be “Male” or “Female”. So here, it will not accept the Gender as “other” as we have shown in our query and hence, it will give an error.

F2:

```
INSERT INTO Volunteer (V_ID, Name, Email, Identification_ID, Gender, Photo, Phone_No, M_ID, Address) VALUES
(898954, 'Steve Smith', 'steve@example.com', 123456789, 'other', '[Link]', '123-456-789', 'Hjashd', '123 Main St, City');
```



This error is caused because it violates the constraint as specified for M_ID in Volunteer which can only take an integer value. Here, we wrote random characters ‘Hjashd’ such that it gave the error.

Both F1 and F2 satisfy specification 1.

[As there is no relational algebra/tuple calculus for the insert operation we have not included it.]

2. One of the functions should involve storage of an image along with a caption into the database.

```
create table student_profile
(
    profile_id int not null,
    profile_photo longblob not null,
    caption varchar(30) ,
    S_ID int not null,
    foreign key (S_ID) references students(S_ID),
    primary key(profile_id)
);
```

profile_id	profile_photo	caption	S_ID
1	BLOB	Profile photo of user	1
2	BLOB	Profile photo ofuser	2
3	BLOB	Profile photo of user	3
NULL	NULL	NULL	NULL

```
',1),
,2),
',3);
```

F3 satisfies Specification 2.

[As there is no relational algebra/tuple calculus for the insert operation we have not included it.]

3. Include cases of natural join, outer join, renaming, two or more different kinds of aggregate functions, and case statements in one or more queries.

Here are five operations with corresponding nested SQL queries and their relational algebra :

F4: Retrieve the total amount donated by each donor along with their names.

SQL Query:

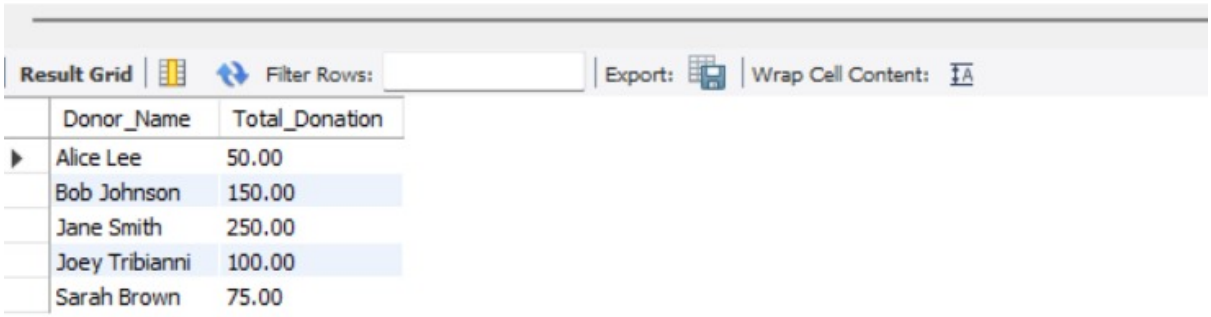
sql

SELECT Donor_Name, SUM(Amount) AS Total_Donation

FROM Donation

GROUP BY Donor_Name;

```
198 •   SELECT Donor_Name, SUM(Amount) AS Total_Donation
199     FROM Donation
200     GROUP BY Donor_Name;
201
202
```



Donor_Name	Total_Donation
Alice Lee	50.00
Bob Johnson	150.00
Jane Smith	250.00
Joey Tribianni	100.00
Sarah Brown	75.00

Relational Algebra:

π Donor_Name, SUM(Amount)(σ Donation.Donor_Name = Donation.Donor_Name (Donation))

F5: Operation: List all students along with their corresponding courses, if any.

SQL Query:

sql

```
SELECT S.Name AS Student_Name, C.Course_name
FROM Students S
LEFT JOIN STUDENT_COURSE SC ON S.S_ID = SC.S_ID
LEFT JOIN Course C ON SC.C_ID = C.C_ID;
```

```
202 •   SELECT S.Name AS Student_Name, C.Course_name
203     FROM Students S
204     LEFT JOIN STUDENT_COURSE SC ON S.S_ID = SC.S_ID
205     LEFT JOIN Course C ON SC.C_ID = C.C_ID;
206
207
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Student_Name	Course_name
Johny Pal	Mathematics
Emma Brown	Mathematics
Michael Lee	NULL
Sarah Johnson	NULL
David Wilson	NULL
Emily Davis	NULL
Daniel Martinez	NULL
Olivia Taylor	NULL
James Brown	NULL
Sophia Garcia	NULL

Relational Algebra:

π Name, Course_name(Students ☐ (SC ☐ Course))

F6: Operation: Retrieve the instructors who are teaching courses along with the number of courses each instructor is teaching.

SQL Query:

sql

SELECT I.Name AS Instructor_Name, COUNT(AC.C_ID) AS Number_of_Courses

FROM Instructors I

LEFT JOIN Active_courses AC ON I.I_ID = AC.I_ID

GROUP BY I.Name;

```
202
203 •  SELECT I.Name AS Instructor_Name, COUNT(AC.C_ID) AS Number_of_Courses
204    FROM Instructors I
205    LEFT JOIN Active_courses AC ON I.I_ID = AC.I_ID
206    GROUP BY I.Name;
207
208
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

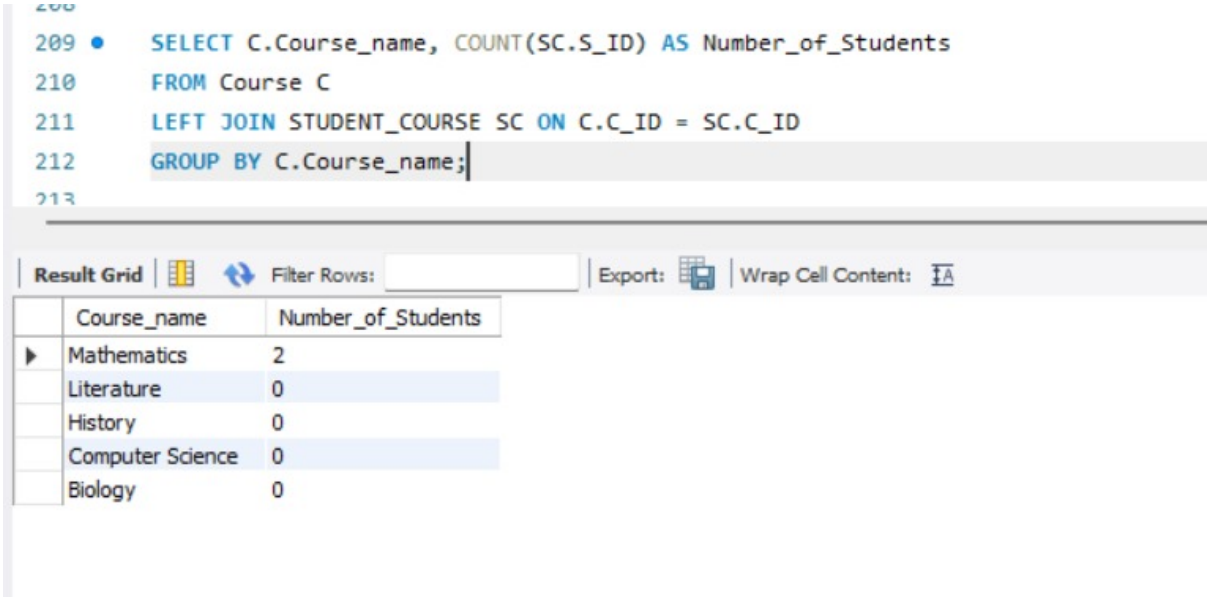
Instructor_Name	Number_of_Courses
John Doe	1
Jane Smith	1
Alex Lee	0
Emily Chen	0
Mark Kim	0

Relational Algebra:

π Name, COUNT(C_ID)(Instructors ☐ Active_courses)

F7: Operation: Retrieve the courses along with the count of students enrolled in each course.

SQL Query:
sql
SELECT C.Course_name, COUNT(SC.S_ID) AS Number_of_Students
FROM Course C
LEFT JOIN STUDENT_COURSE SC ON C.C_ID = SC.C_ID
GROUP BY C.Course_name;



Relational Algebra:

π Course_name, COUNT(S_ID)(Course ☐ STUDENT_COURSE)

F8: Operation: Retrieve the volunteers along with the courses they are assisting in, including those who are not currently assisting in any course.

SQL Query:

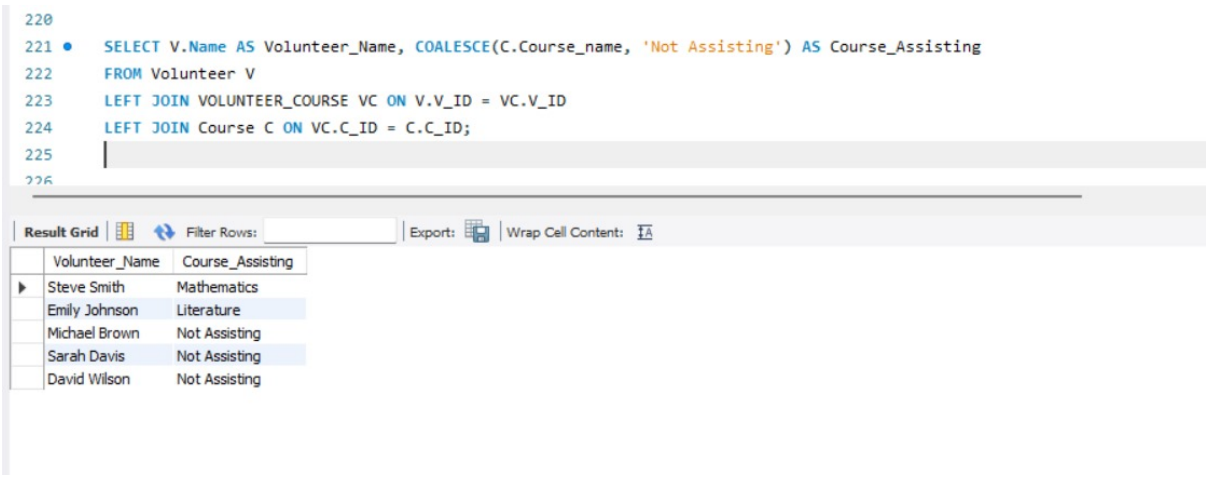
sql

SELECT V.Name AS Volunteer_Name, COALESCE(C.Course_name, 'Not Assisting') AS Course_Assisting

FROM Volunteer V

LEFT JOIN VOLUNTEER_COURSE VC ON V.V_ID = VC.V_ID

LEFT JOIN Course C ON VC.C_ID = C.C_ID;



Relational Algebra:

π Name, COALESCE(Course_name, 'Not Assisting')(Volunteer ☐ Volunteer_Course ☐ Course)

ALL F4-F8 Operations follow specification 3.

Contribution:

G1Q1: Om Ambekar

G2Q2: Dhru Jain Khilosiya

G2 Q1(1-7): Himani Trivedi

G2 Q2: Priya Darji

G1&G2 Q1(1-3): Diya Parashar