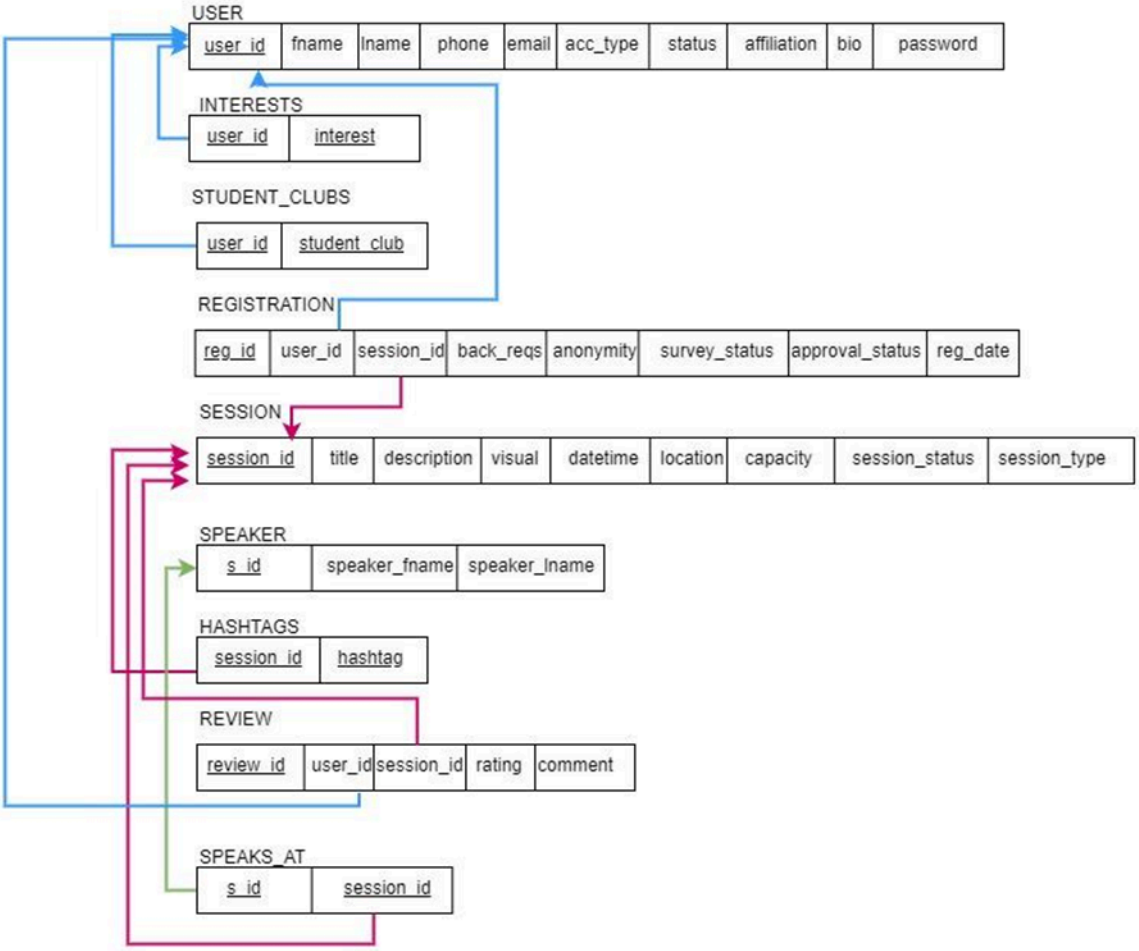
IS503 DATABASE CONCEPTS AND APPLICATIONS

Assignment 2

A) After drawing ER diagram and relational mapping of your event tracker application, which we call MET from now on, you come up with this relational mapping (see figure 1) below. Please note that this is a sample solution for your part B in assignment 1, which might differ from your proposed ER diagram/ relational mapping, but to be on the same page, you need to use this one.

According to this ER diagram, write the following queries using relational algebra.



USER

user_id	fname	lname	phone	email	acc_type	status	affiliation	bio	password

INTERESTS

user_id	interest

STUDENT_CLUBS

user_id	student_club

REGISTRATION

reg_id	user_id	session_id	back_reqs	anonymity	survey_status	approval_status	reg_date

SESSION

session_id	title	description	visual	datetime	location	capacity	session_status	session_type

SPEAKER

s_id	speaker_fname	speaker_lname

HASHTAGS

session_id	hashtag

REVIEW

review_id	user_id	session_id	rating	comment

SPEAKS_AT

s_id	session_id

Figure 1

1) Find the names and surnames of all users registering in all sessions with a session capacity of over 100.

2) Retrieve the start time and end time of all sessions attended by users with user_id = 3 or user_id = 6, excluding sessions attended by user_id = 4. Use the 'Minus (set difference)' operation for this question.

3) Retrieve the full names of all users who have registered for sessions with a registration status of 'approved' and have provided a review for at least one session.

4) Find the most popular sessions among all the sessions that happened between 1.1.2024 and 5.1.2024 (status of the session must be “past”)

5) Find the session names that had 5 ratings from the users. Additionally, find the session names that have the status as 'past'. Retrieve the combined list of session names. Use the ‘Union’ operation for this question.

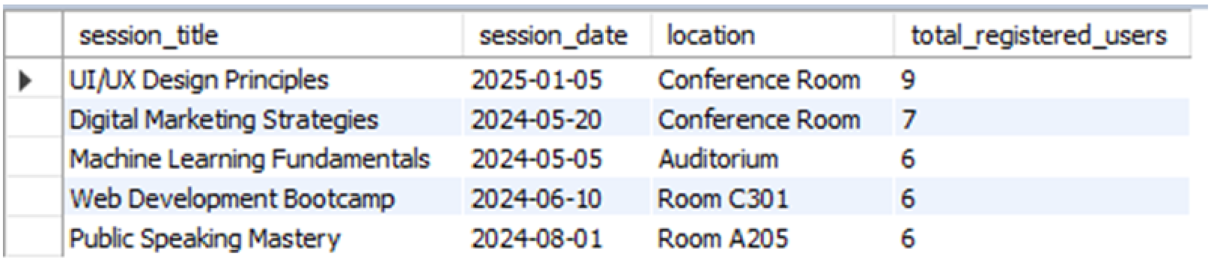
Tips:

- You may handwrite your relational algebra answers, but please make sure your writing is legible. If you prefer to type them on the computer, you can use these characters: ⋈, ⟕, ⟖, ⟗, ÷, ×, ∪, ∩, σ, ρ, ℱ, ←, π.

B) A MySQL export of the schema is provided with the assignment. Check this guide to set up MySQL Workbench and import the schema. Write the following queries using SQL. Provide a screenshot of your results to show that you have used MySQL Workbench. Provide a clear-text version of your query (so that it can be copied and pasted to MySQL Workbench for grading). Your queries must be single blocks of queries that can be written in a single line. The row order is not important unless a specific order is required.

According to this MySQL file, write the following queries using SQL. The expected results are given as figures.

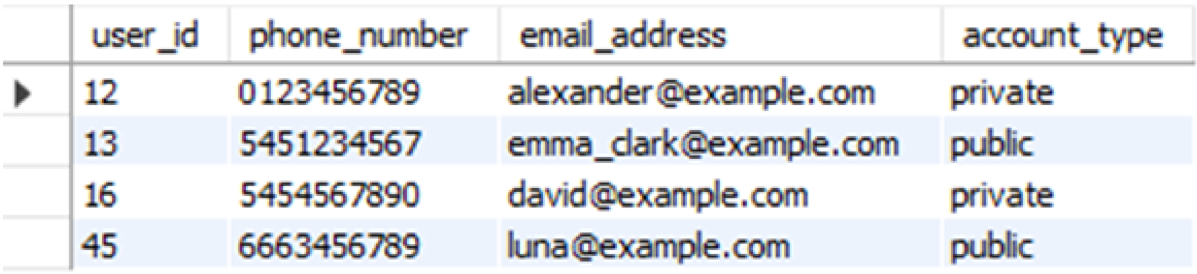
1) Identify the top 5 most registered sessions based on the number of registered users. List the session title, date, location, and the total number of registered users for each session.



session_title	session_date	location	total_registered_users
UI/UX Design Principles	2025-01-05	Conference Room	9
Digital Marketing Strategies	2024-05-20	Conference Room	7
Machine Learning Fundamentals	2024-05-05	Auditorium	6
Web Development Bootcamp	2024-06-10	Room C301	6
Public Speaking Mastery	2024-08-01	Room A205	6

2)

a) Create a view named 'ActiveUsersWithMultipleRegistrations' to find the users who have registered more than 3 times in the next 6 months from the current date. Retrieve their user IDs, phone numbers, email addresses, and account types. (You may use CURDATE(), DATE_ADD() operations)(**this resulting table may change according to the current date you run the query; do not worry about it**)



user_id	phone_number	email_address	account_type
12	0123456789	alexander@example.com	private
13	5451234567	emma_clark@example.com	public
16	5454567890	david@example.com	private
45	6663456789	luna@example.com	public

b) Create a trigger named "PreventSessionOverCapacity" to prevent users from registering for sessions that have reached their maximum capacity. Raise an error if a user attempts to register for a session that is already full. (To make your trigger work, do not forget to use a delimiter at the start and at the end of the statement)

You may find an example below for inserting an exception and printing the error in case of preventing voters from voting for themselves.

Example:

CREATE TRIGGER prevent_self_votes BEFORE INSERT ON votes

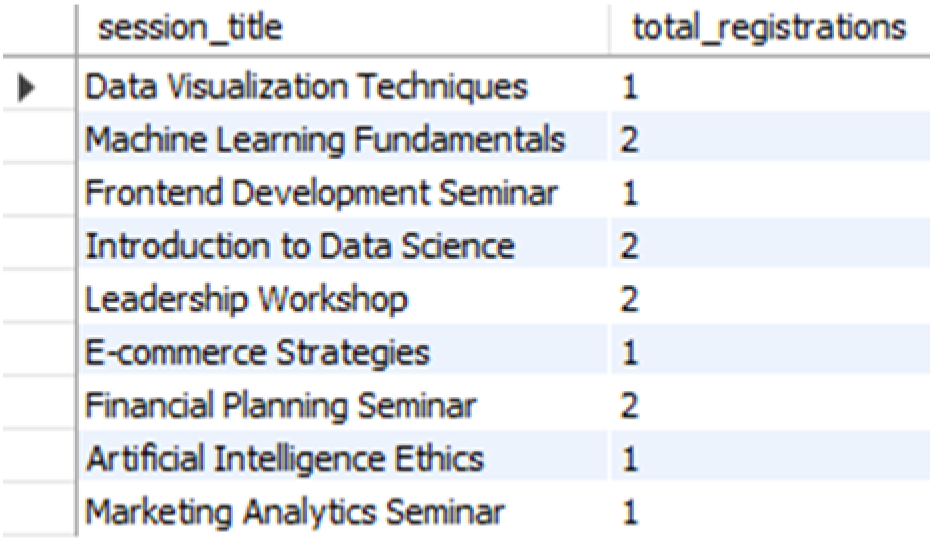
FOR EACH ROW

BEGIN

IF(new.user_id = (SELECT author_id FROM posts WHERE id=new.post_id)) THEN

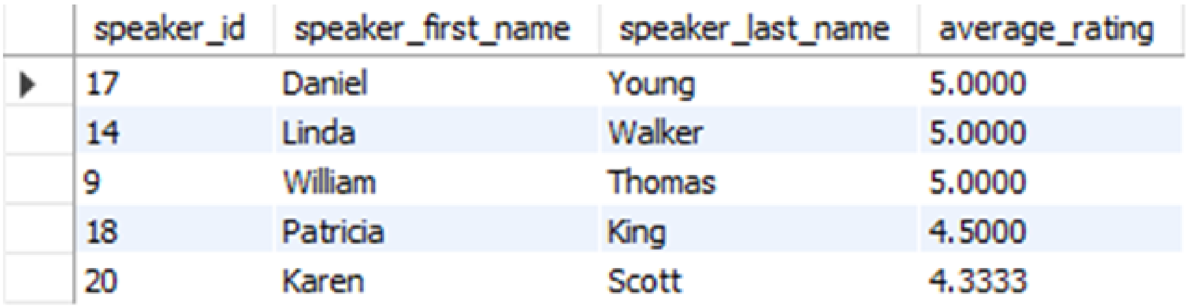
```
SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = "you cannot vote for yourself";

END IF;

END;
```

3) List the session titles that require immediate attention due to low registration numbers. Retrieve the session titles and the total count of registrations lower than three for each session that has a registration status set to 'approved'.



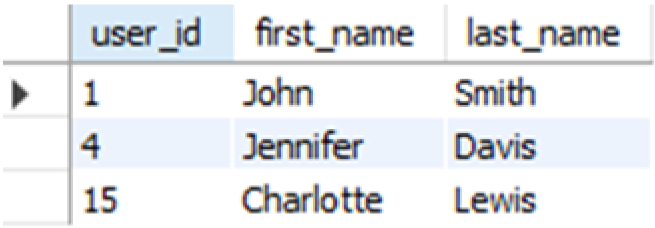
session_title	total_registrations
Data Visualization Techniques	1
Machine Learning Fundamentals	2
Frontend Development Seminar	1
Introduction to Data Science	2
Leadership Workshop	2
E-commerce Strategies	1
Financial Planning Seminar	2
Artificial Intelligence Ethics	1
Marketing Analytics Seminar	1

4) Calculate the average rating for sessions conducted by each speaker. Retrieve the top 5 speakers' IDs, first names, last names, and the average ratings in descending order.



speaker_id	speaker_first_name	speaker_last_name	average_rating
17	Daniel	Young	5.0000
14	Linda	Walker	5.0000
9	William	Thomas	5.0000
18	Patricia	King	4.5000
20	Karen	Scott	4.3333

5) Identify the users who have interests in “programming” or “computer” and match the requirements specified in the registration table. Retrieve these users' user IDs, first names, and last names.



user_id	first_name	last_name
1	John	Smith
4	Jennifer	Davis
15	Charlotte	Lewis