SQL Assignment - 135409

(Note: Ex1 is required while Ex2 is optional)

Ex1 (Required):

The relational database with the following schemas:

Student(**Snum**, Name, Major, Level, Age)
Class(**Name**, Semester, WeekDay, StartTime, EndTime, Room, Fid)
Enrolled(**Snum**, **ClassName**)
FacultyMember(**Fid**, Name, Dept)

The keys are in bold. The meaning of these relations is straightforward.

For example:

- Enrolled has one record per student-class pair such that student is enrolled in class. "Level" can be one of values "undergraduate", "graduate", "professional".
- "Weekday" belongs to {2,3,4,5,6,7}.
- The format of "StartTime", "EndTime" is hh:mm.
- "Enrolled"."ClassName" is a foreign key referenced to "Class"."Name". "Enrolled"."Snum" is a foreign key referenced to "Student"."Snum".
- "Class"."Fid" is a foreign key referenced to "FacultyMember"."Fid".

Write the following queries in SQL. No duplicates should be printed in any of the answers.

1. Create all relations in this database
2. Find the students (Snum, Name) of all CS Majors (Major = "CS") who are enrolled in the course "IT3292E Database 20221".
3. Find the students (Snum, Name) of all classes that either meet in room D9-205 or are taught by "Prof. Nguyen" working in "Computer Science" Department.
4. Find the (Snum, Name) of all pairs of students who are enrolled in some class together.
5. Find the students (Snum, Name), who are enrolled in two classes that meet at the same time, and names of these two classes
6. Find the faculty members (fid, name) who teach every weekday in the semester 20221.
7. Print the Level and the average age of students for that Level.
8. Find the faculty members (fid, name), who teach more than 4 classes per semester, and the number of classes they teach in each of these semesters
9. Find the students with the least number of classes enrolled

10. Find the names of all students who are not enrolled in any class taught by professors from department “Computer Science”

Write algebraic expressions for each above queries.

Ex2 (Optional):

A relational movie database with following five tables

ACTOR (id, fname, lname, gender)
MOVIE (id, name, year, rank)
DIRECTOR (id, fname, lname)
CAST (pid, mid, role)
MOVIE_DIRECTOR (did, mid)

id column in ACTOR, MOVIE & DIRECTOR tables is a key for the respective table. CAST.pid refers to ACTOR.id, CAST.mid refers to MOVIE.id MOVIE_DIRECTOR.did refers to DIRECTOR.id and MOVIE_DIRECTOR.mid refers to MOVIE.id

Write the following queries in SQL. No duplicates should be printed in any of the answers.

1. List all the actors who acted in at least one film in 2021 and at least one film in 2022.
2. List all the movies that have the same year as the movie "Shrek", but a better rank. (Note: bigger value of rank implies a better rank)
3. List all the directors who directed more than 3 films in the last year
4. List first name and last name of all the actors who played in the movie "GULLIVER's travel"
5. List all directors in descending order of the number of films they directed
6. Find all the actors who acted in films by at least 10 distinct directors (*i.e.* actors who worked with at least 10 distinct directors).
7. Find all actors who acted only in films before 2020.
8. Find the films with more women actors than men.
9. For every pair of male and female actors that appear together in some film, find the total number of films in which they appear together. Sort the answers in decreasing order of the total number of films.
10. Find the year with the largest number of films.

Write algebraic expressions for each above queries.