Assignment SQL

A. The relations for this assignment are in a database called **raghu564**, and have the following schemas:

Student(*Snum*, Name, Major, Level, Age)
Class(*Name*, Time, Room, Fid)
Enrolled(*Snum, ClassName*)
Faculty(*Fid*, Name, Dept)

The keys are in italics. The meaning of these relations is straightforward; for example, Enrolled has one record per student-class pair such that student is enrolled in class. They were created using the following SQL statements:

```
CREATE TABLE Student (
            Snum int,
            Name char(10),
            Major char(10),
            Level char(2),
            Age int );

CREATE TABLE Class (
            Name char(10),
            Time char(10),
            Room char(10),
            Fid int );

CREATE TABLE Enrolled (
            Snum int,
            ClassName char(10)
            );

CREATE TABLE Faculty (
            Fid int,
            Name char(10),
            Dept char(10)
            );
```

The Queries

Using the database **raghu564**, write the following queries in SQL. No duplicates should be printed in any of the answers.

1. Find the names of all CS Majors (Major = "CS") who are enrolled in the course "Math92".

2. Find the names of all CS Majors (Major = "CS") who are enrolled in the course "Math92" and are older than some History freshman (Level="FR").
3. Find the names of all classes that either meet in room R128 or are taught by "H.Merlin".
4. Find the names of all pairs of students who are enrolled in some class together.
5. Find the names of all pairs of students who are enrolled in two classes that meet at the same time (including pairs of students who are enrolled in the same class).
6. Find the names of faculty members who teach in every room in which some class is taught in the time period "MW9-10".
7. Find the names of faculty members such that the combined enrollment of the courses that they teach is less than 5.
8. Print the Level and the average age of students for that Level, for each Level.
9. Find the name of the student who is enrolled in the most classes.
10. Find the names of all students who are not enrolled in any class taught by "H.Merlin".

B. A relational **movie** database. The data in this database is from the IMDB website. The database exists already on IISQLSRV. The database consists of seven tables, however you will be using only the 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

1. (List all the actors who acted in at least one film in 2nd half of the 19th century and in at least one film in the 1st half of the 20th century
   b. List all the directors who directed a film in a leap year

2. (List all the movies that have the same year as the movie 'Shrek (2001)', but a better rank. (Note: bigger value of rank implies a better rank)

3. List first name and last name of all the actors who played in the movie 'Officer 444 (1926)'

4. List all directors in descending order of the number of films they directed

5. a. Find the film(s) with the largest cast.
   b. Find the film(s) with the smallest cast.
   In both cases, also return the size of the cast.

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 1960.

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. For every actor, list the films he/she appeared in their debut year. Sort the results by last name of the actor.

11. The *Bacon number* of an actor is the length of the shortest path between the actor and Kevin Bacon in the "co-acting" graph. That is, Kevin Bacon has Bacon number 0; all actors who acted in the same film as KB have Bacon number 1; all actors who acted in the same film as some actor with Bacon number 1 have Bacon number 2, etc. Return all actors whose Bacon number is 2.
12. A *decade* is a sequence of 10 consecutive years. For example 1965, 1966, ..., 1974 is a decade, and so is 1967, 1968, ..., 1976. Find the decade with the largest number of films.