95 – 703: Database Management

**SQL #1** (hardcopy due on July 7, in class before the lecture starts)

*Turn in a well formatted printout of your SQL statements as they were executed in the SQL*Plus environment and the results of running each statement (provide echo and feedback). Set the LINESIZE and PAGESIZE values optimally to ensure that there are no wrapping lines or repeated column headers in the results (for further formatting tips refer to the "**Formatting SQL Output**" document available on the class website). Identify each answer clearly. Each question should be answered by a <u>single SQL statement</u> unless requested otherwise. Use <u>only</u> the SQL concepts covered in class so far (by June 30).*

An IT Consulting Company assigns its employees to specific departments. One of the employees from each department manages that department. Some employees may supervise other employees, a function different from managing a department.

The database model (ERD and schema provided below) focuses on employee training only. Employees have been encouraged to take classes at local colleges in order to enhance the skills needed for performing their work. The manager of the department where an employee works (or a senior Supervisor) must approve each training (i.e., each class) that the employee plans to take. The approved training must be completed within the same fiscal year (fiscal year is usually different from the calendar year) when it was approved. Each college has its own class coding system that is different from other colleges and is unique to that college.

The company keeps details about each training including the grades each employee receives upon completion of the training (i.e., completion of the class taken). Tuition paid by the company is recorded as well. The grades follow the same scheme as the grading scheme used in Heinz College. Both letter grade and score associated with the letter grade are stored. The score is used to calculate various averages when needed or requested.

The ERD and schema are:
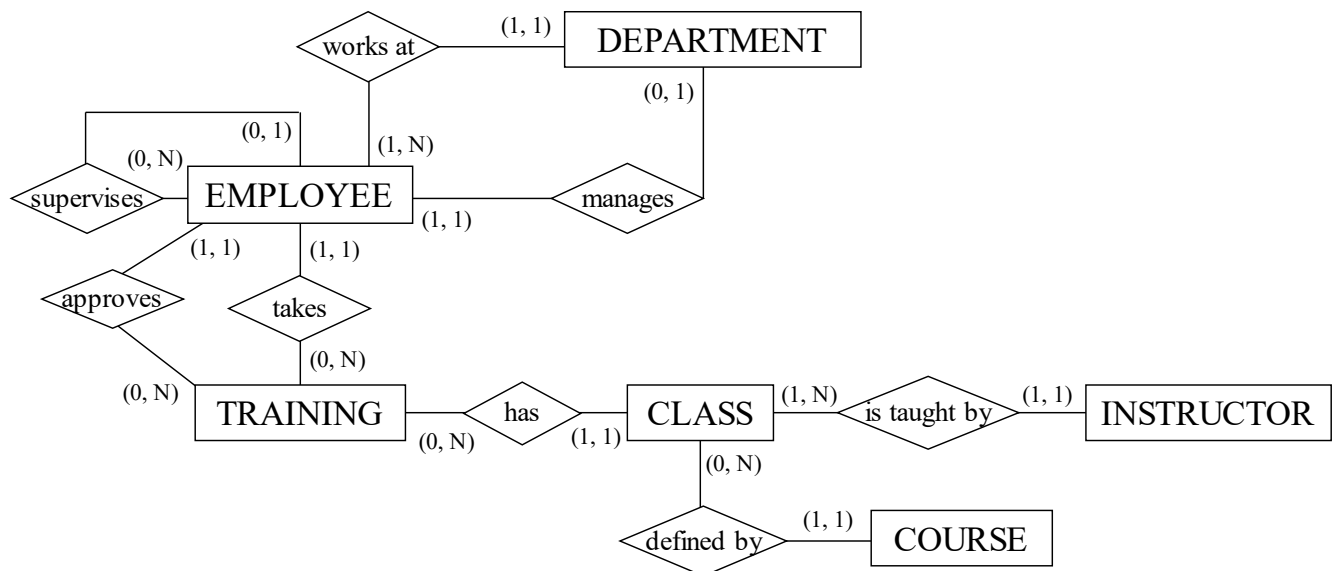
EMPLOYEE (Emp_ID, Fname, Lname, Email, Position, DOB, Hire_Date, Allowance, Street, City, State, Zip_Code, Dept_ID@, Sup_ID@)

DEPARTMENT (Dept_ID, Dept_Name, Phone, Training_Budget, Dept_Mngr@)

TRAINING (TID, Emp_ID@, Appr_Date, Grade, Score, Crs_ID@, Section@, Sem_Cmpltd@, ApprovedBy@)

COURSE (Crs_ID, Crs_Title, Crs_Type, College_Name, Tuition)

CLASS (Crs_ID@, Section, Sem_Cmpltd, Day, Time, Instr_ID@)

INSTRUCTOR (Instr_ID, Fname, Lname, Phone, Specialty)

Run the script '**SQL_script1.txt**' provided on the class website to create the "Training" database as defined above.

Part I

As you have already learnt, each table should have its PK defined and each relationship should be represented by a foreign key. Examine the provided script to determine which PK and/or FK constraints are still to be created in order to conform to the model (the ERD and the schema above).

Do not change the provided script but create and execute appropriate statements that would add the missing constraints. Each constraint must be named according to the convention defined in the lectures. Show your statements as they are executed in the SQL*Plus (show the feedback from SQL Server indicating that the statements were executed correctly).

Part II

Create and execute SQL statements to answer the following questions:

1. List the employees who had received only grades **B** or better in all class he/she had taken.

2. Provide ID and name of employees (i.e. supervisors) who did not approve any training in 2021.

3. List ID and name of any employee who has failed a class (i.e., received grade **R**). Also include the class title and semester when the class was taken.

4. List all employees (concatenate id and name) that have taken any class that has '*ing*' in its title and cost less than $3,000. Also include the class title, the cost of the class, and employee's department name. Order the result alphabetically by department's name and then by employee's last name.

5. List the ID, name, and specialty of Instructors who were scheduled to teach in *Oakland* College or who specialized in any *Programming*. Also display the college name.

6. List employees who have taken the *Database Management* course in a spring semester and received a grade **B** or higher. List the employee's name, the course information (semester, section) and the grade. Order the result by semester (most recent semester should be listed first), and by last name.

7. List classes that employees who work in the *IT* Department have completed in the previous two year. List the course title and the semester. Order the result by semester, and by title.