COMP 7640

Written Assignment #1

Due: 11:59PM, Feb. 20 (Thursday), 2025

1. A corporation's database needs to record data concerning staff members (identified by `sid`, with attributes `wage` and `email`), projects (identified by `pid`, with attributes `pname` and `funding`), and pets of staff members (identified by `pet_name`, with `species` as attributes). A staff member is assigned to one or more projects, and each project must have one staff member who acts as the project leader. A staff member can have multiple pets while each pet has one owner.
   Draw an ER diagram that captures this information. Show the reasons for different constrains briefly. **(30 marks)**

2. Consider the scenario in Question 1, with the following additional requirements.
   a. The information for the pets will be linked to their owners. A pet must be identified uniquely by `pet_name` *within the scope of its owner* (i.e., pet_name is no longer the primary key).
   b. We are not concerned with information about a pet once the owner is no longer part of the corporation.

   Write SQL statements to create the corresponding relations and capture as many of the constraints as possible. Also state the constraints that you cannot capture, if any.
   (30 marks)

3. Answer each of the following questions briefly. The questions are based on the following relational schema:

   Emp(*eid:* integer, *ename:* string, *age:* integer, *salary:* real)
   Dept(*did:* integer, *dname:* string, *budget:* real, *managerid:* integer)
   Works(*eid:* integer, *did:* integer, *pcttime:* real)

   a) Assume that an employee *works* in one or more departments. Write the SQL statement required to create the *Works* relation, including appropriate versions of primary and foreign key integrity constraints, such that when an employee is deleted all his/her work records are also removed, and the deletion of a department is disallowed if there are one or more employees working in the department.
   b) Write an SQL statement to create the *Dept* relation such that every department is guaranteed to have a manager (represented by *managerid*) and the manager must be an existing employee.
   c) Write an SQL statement to add Alice as an employee with *eid* = 200, *age* = 20 and *salary* = 15000.
   d) Write an SQL statement to delete the 'Toy' department.

   (40 marks)

Late Penalty: Late homework will be marked down 20% for each day it is late. Any exceptions to the late rule must be made prior to when the assignment is due and the excuse needs to be a good one - just too busy won't cut it. Individual exceptions are unfair to other students and hence they won't be made unless the circumstances are truly exceptional.

Plagiarism: All work submitted by you should be your own. **Copying or sharing of assignments would constitute plagiarism. Penalty will be given to those involved in plagiarism. This will be no exception once plagiarism is caught – being copied without notice won't excuse it; you should simply keep your assignment well.** The Turnitin system might be used to check the "originality" of your submitted assignment for the detection of plagiarism.

Submission: Please submit the soft copy of your assignment (jpg/word/pdf file) to Moodle.