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Homework 1

Max total: 3 points

I understand that, if I get caught cheating (e.g., copying from any online/offline source) on this assignment, I will receive a grade of zero for the assignment and my letter grade will be decreased by one level. Furthermore, I must sign the official form of Watson College.

Name: Harsimran Singh Avtar Singh Dhillon

Signature: Harsimran Singh Avtar Singh Dhillon

1. (2 points) Design an ER diagram for the Student Registration System based on the provided Requirements Document. Remember to indicate the key for each entity set and the connectivity of each relationship. Use (min, max) format to indicate connectivity. Note that many constraints cannot be represented in the ER diagram, and they will be represented at later stages of the database design. Question 3 of this homework asks you to list these constraints.

Answer: Please find above the ER diagram of the same.

2. (0.5 points) Discuss whether it is a good idea or not to create a super entity set for Students and Faculty in the ER diagram for the Student Registration System.

Answer: Both the students and the faculty have 2 attributes in common i.e. Name and Email. So making a super entity as Person where we can keep these attributes and all the other entity specific attributes at sub type level will be beneficial. So I think creating a super entity set as Person for Students and Faculty is a good idea as it will reduce redundancy. While also keeping the special attributes like office, rank, status specific to the sub type level.

3. (0.5 points) Identify constraints in the Requirements Document for the Student Registration System that cannot be expressed using the ER model we discussed in class. First list the constraints not represented in the ER diagram for each entity set separately. Then list the constraints involving multiple entity sets.

Answer: There are different constraints which cannot be expressed using the ER model.

1. In Student Entity we have email as an attribute which is different for different students and it can be used as a candidate key
2. In Class Entity, the Classes are uniquely identified by the combination of the following attributes: cid, sect#, year, and semester. This is super key and we cannot represent that using ER diagram
3. In Course Entity we have integrity constraints related to course number which we cannot express using ER model
4. In Enrollment Information we again have integrity constraints related to lgrade and ngrade
5. In Faculty information also we have attributes like email and offices which are different for each faculty so it can also be used as a key, but since we can only have 1 primary key we are not able to represent these unique values using ER diagram
6. We also have other integrity constraints like GPA, days, semester, size, limit, faculty rank, overlapping timings and registration condition