

Homework 1

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Max total: 4 points

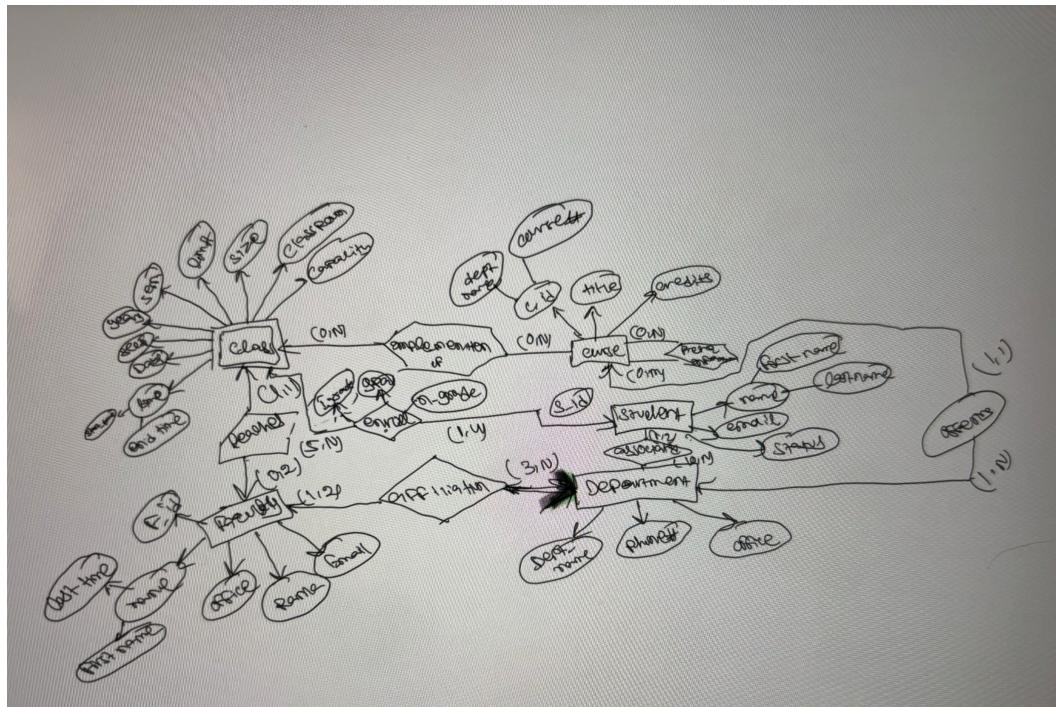
Before you begin, for academic honesty, please read the paragraph below and sign there. I have done this assignment completely on my own. I have neither copied nor shared my solution with anyone else. I acknowledge that if I engage in plagiarism or cheating, I will sign an official form admitting to the violation, which will be added to my official university record. I also understand that a first offense will result in a grade of 0 for the assignment and a one-level reduction in my course letter grade, and any subsequent offense of any kind will result in a grade of 'F' for the course.

Name: Ankita Patra

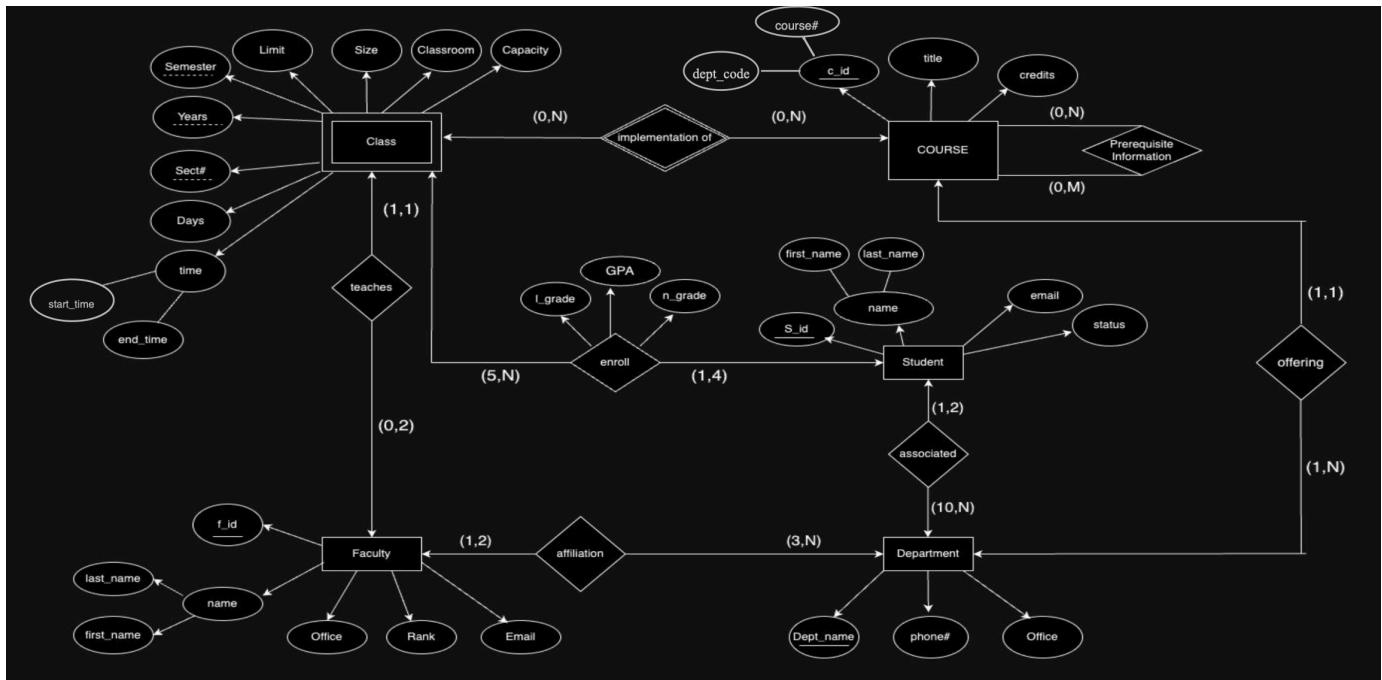
Signature:Ankita Patra

You can draw an ER diagram using <https://app.diagrams.net/> A hand-drawn ER diagram won't be accepted.

1. (3 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.



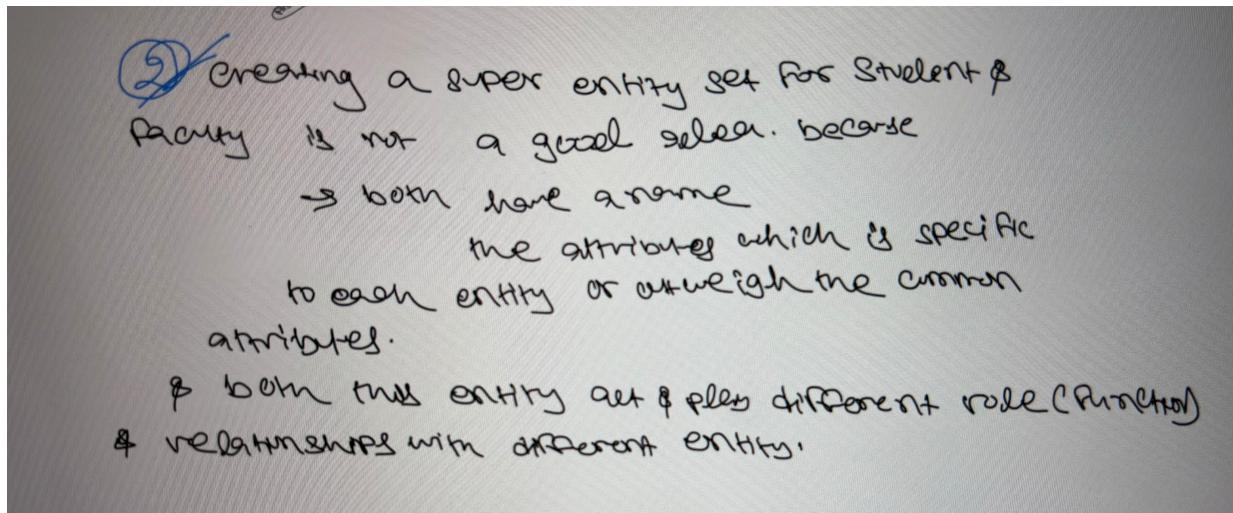
ER dig for my understanding



Final ER diagram

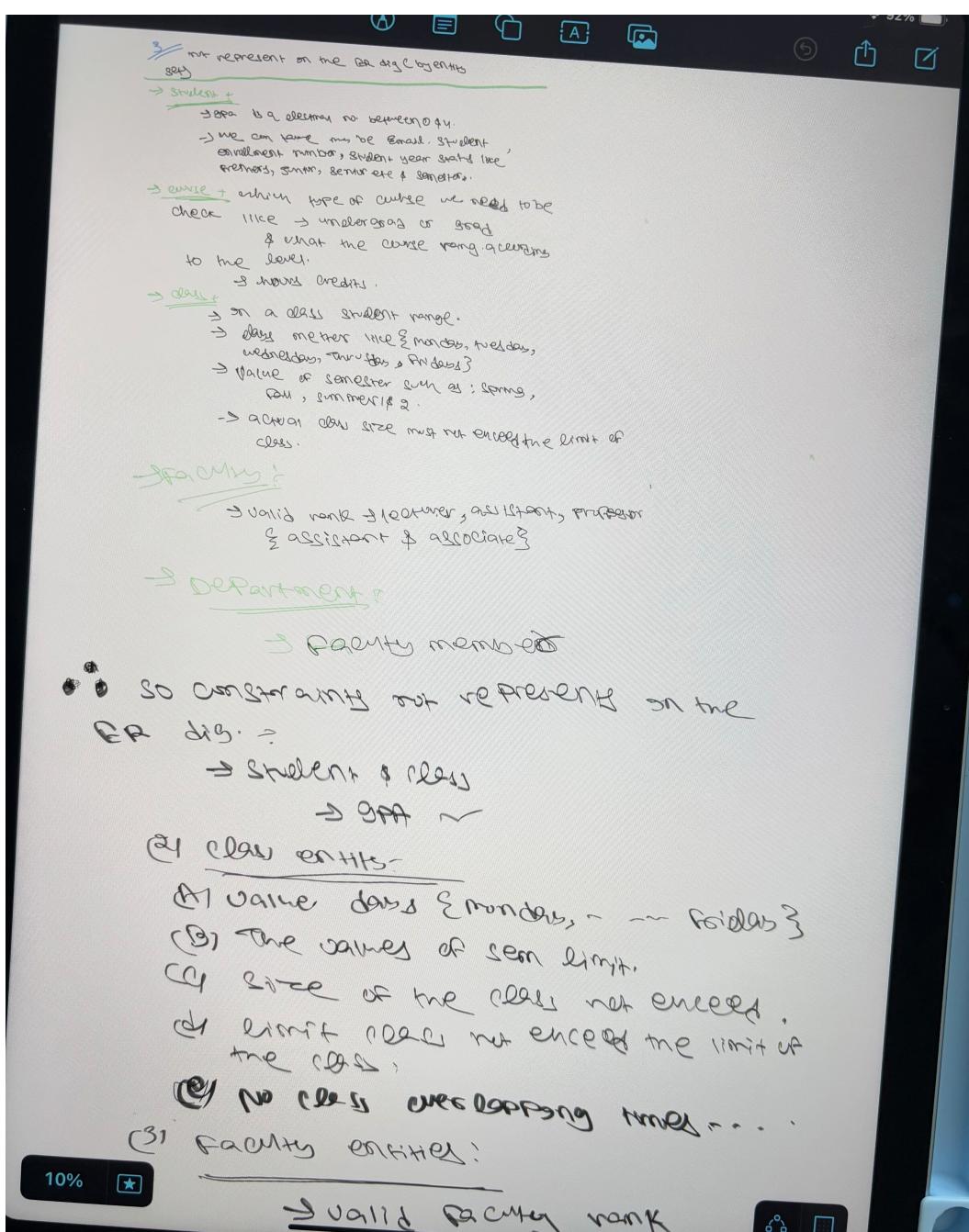
2. (0.5 points) Discuss whether it is a good idea or not to create a super entity set for Students and Faculty in the ER diagram for the Student Registration System.

Ans: No, because both the entity plays different functions and have different relationships with other entities.



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 :



Constraints Involving multiple entities

→ Faculty & Class Entities:

NO FACULTY member can teach
classes with overlapping times.

→ Student & Class Entities:

→ size < limit.

→ The student has not been registered
on a different section of the same
course.

→ complete all pre-req course with least
grade C.

→ The time of the class not overlaps
with the time of the time of the
class the student already enrolls.

Constraints not represented in the ER diagram: -

1) Student and Class Entity Relationship: -

GPA is a decimal number between 0 and 4.

2) Class Entity: -

- A) The values of days are limited to {Monday, Tuesday, Wednesday, Thursday, Friday}.
- B) The values of semester are limited to {Spring, Fall, Summer 1, Summer 2}.
- C) The actual size of a class must not exceed the limit of the class.
- D) The limit of a class must not exceed the capacity of the assigned classroom.
- E) No classes of overlapping times can be assigned to the same classroom.

3) Faculty Entity: -

10. Valid values for faculty rank are {lecturer, assistant professor, associate professor, professor}.

Constraints Envolving multiple entity set: -

1) Faculty and Class Entity : -

9. No faculty member can teach classes with overlapping times.

2) Student and Class Entity: -

- a. The class still has room for new students, i.e., size < limit.
- b. The student has not been registered in a different section of the same course.
- c. The student has completed all the prerequisite courses with a grade of at least C
- d. The time of the class does not overlap with the times of the classes the student has already enrolled in.

Thank You