

ComS 363 Fall 2022 Practice Problems on ER diagram

Topic: Subtlety of ER diagrams

Learning objective: Understand subtlety involving weak entity sets and relationship sets.

Reference materials:

[1] <http://pages.cs.wisc.edu/~dbbook/openAccess/thirdEdition/solutions/ans3ed-odonly.pdf>

Raghu Ramakrishnan and Johannes Gehrke. Database Management Systems, 3rd Edition 3rd Edition. McGraw-Hill Higher Education, 2003.

1. Add to the ER diagram we did for CP-WK3 to indicate the following requirement. An employee can have dependents. The dependent name, gender, date of birth, and the relationship of the employee and his/her dependent needs to be kept. Names of dependents for the same employee are unique. But different employees may have the same names for their dependents. Each dependent must be associated with exactly one employee.
2. Given the ER diagrams in Figure 1 and Figure 2, answer the following questions.

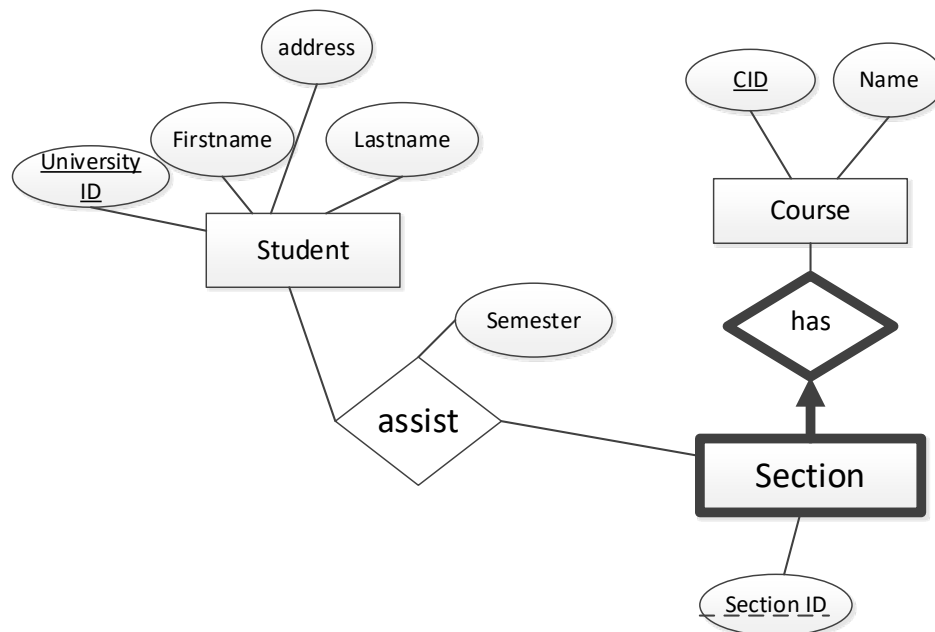


Figure 1: ER diagram modeling a database of teaching assistants and course sections

- a. Does the diagram in Figure 1 indicate that each student must assist in teaching some sections? If not, modify the ER diagram in Figure 1 to capture the requirement.
- b. Does the diagram in Figure 1 indicate that each section must have at least one teaching assistant? If not, draw the ER diagram that enforces such a requirement.
- c. For the ER diagram in Figure 1, could we keep a history of assistantships for the same student assisting in teaching the same course section in different semesters?

- d. A relationship set is a set. What make a relationship in the “assist” relationship set unique in the ER diagram in Figure 1?

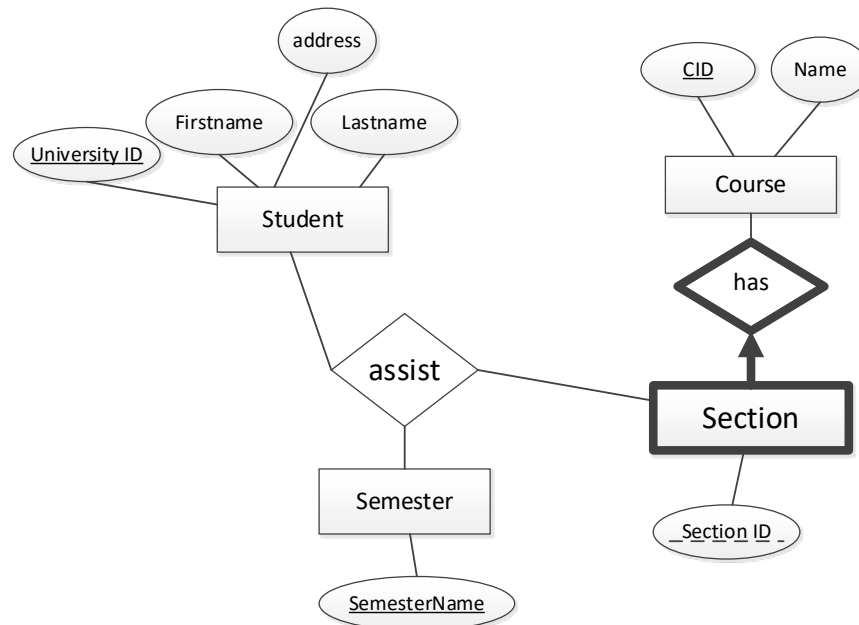


Figure 2: ER diagram modeling a database of teaching assistants and course sections

- e. A relationship set is a set. What make a relationship in the “assist” relationship set unique in the ER diagram in Figure 2?
- f. Compare the two ER diagrams in Figure 1 and Figure 2, which of the ER diagram requires that SemesterName must be provided when students assist in teaching course sections.
- g. Is it possible to use existing ER diagram notations to indicate a constraint that a particular student is not allowed to assist a certain professor in teaching some sections either in Figure 1 or Figure 2?