CS W186 - Spring 2024
Exam Prep 9
DB Design

Database Design

As chancellor of UC Berkeley, you are tasked with designing a new final exam scheduling system to make it easier on students. Using the following assumptions, fill in the ER diagram we give you.

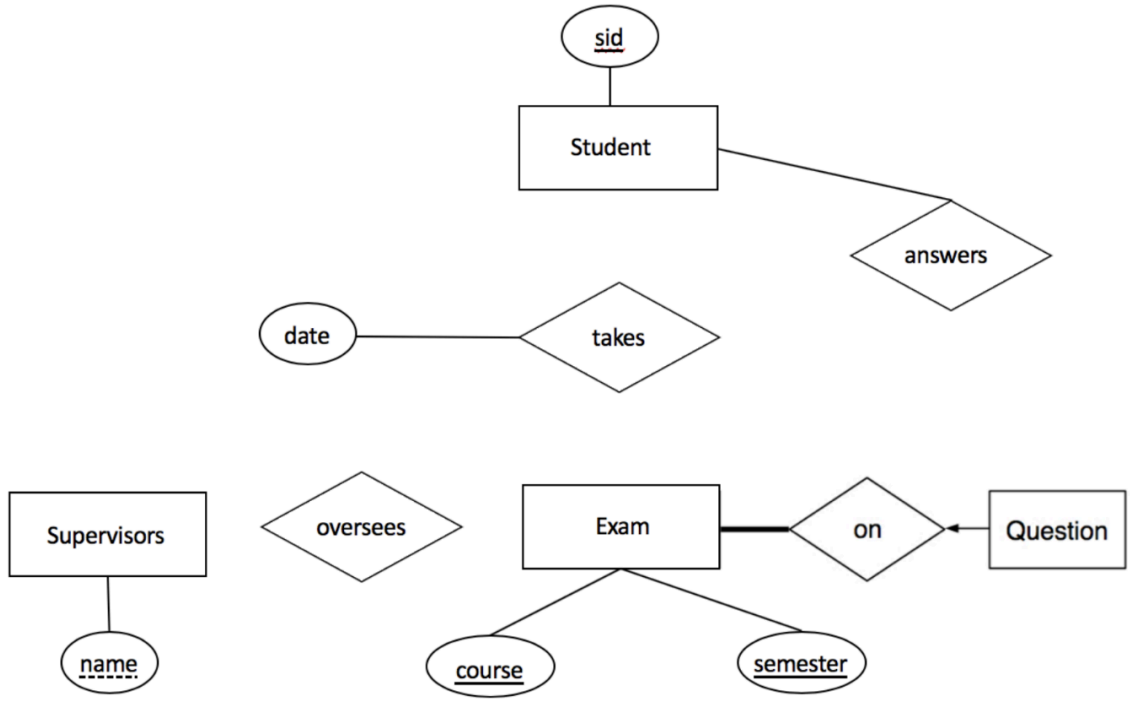
• A student may take any number of exams, and every exam is taken by at least one student.

• An exam is uniquely identified by the combination of a course and a semester.

• Every exam has at least one supervisor. A supervisor oversees exactly one exam.

• There is at least one question on every exam, and a question appears on at most one exam.

• A question on an exam may be answered by any number of students, and a student may answer any number of questions on an exam.



1. What type of edge should be drawn between the Supervisors entity and the oversees relationship set?

2. What type of edge should be drawn between the Exam entity and the oversees relationship set?

3. What type of edge should be drawn between the Student entity and the takes relationship set?

4. What type of edge should be drawn between the Exam entity and the takes relationship set?

5. What type of edge should be drawn between the Questions entity and the answers relationship set?

6. Consider the attribute set R = ABCDEF and the functional dependency set F = {BE → C, B → F, D → F, AEF → B, A → E}. Which of the following are candidate keys of R? Mark all that apply

(A) ACD

(B) AD

(C) FC

(D) BF

7. Given Attribute Set R = ABCDEFGH and functional dependencies set F = {CE → GH, F → G, B → CEF, H → G}. What relations are included in the final decomposition when decomposing R into BCNF in the order of functional dependencies set F?

8. True or False: The decomposition of attribute set R = ABCDEF, given the functional dependency set F = {B → D, E → F, D → E, D → B, F → BD}, into ABDE, BCDF is lossless.