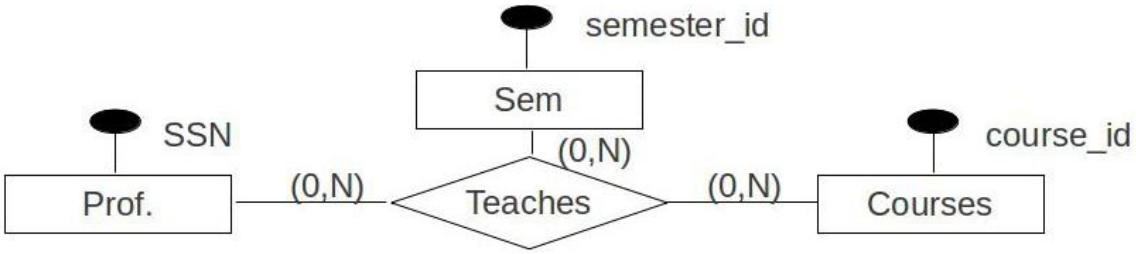
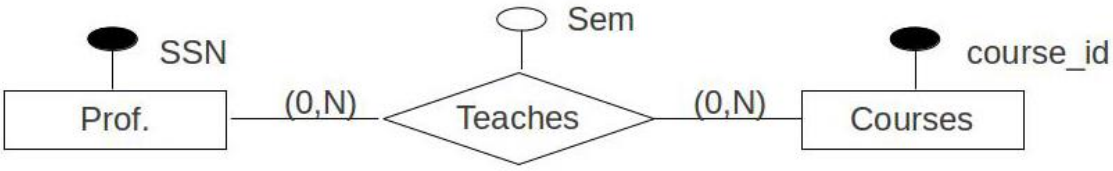
Databases Course (2017-100-KEN2110)
Exercise Week 2 (Solutions)

Exercise 1) A university database contains information about professors (identified by social security number, or SSN) and courses (identified by course_id). The ER diagram for each of the following situations is provided.

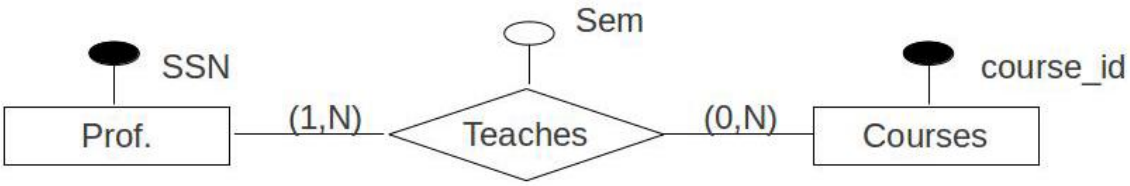
a. Professors can teach the same course in several semesters, and each offering must be recorded.



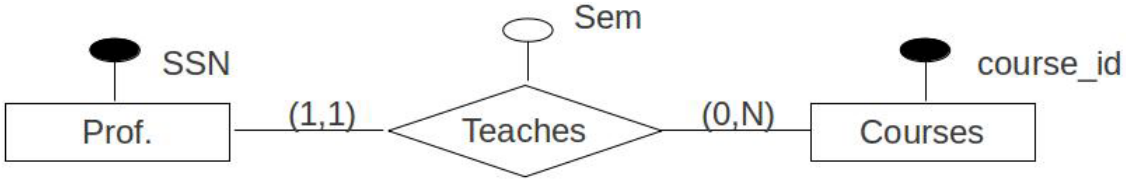
b. Professors can teach the same course in several semesters, and only the most recent such offering needs to be recorded. (Assume this condition applies in all subsequent questions.)



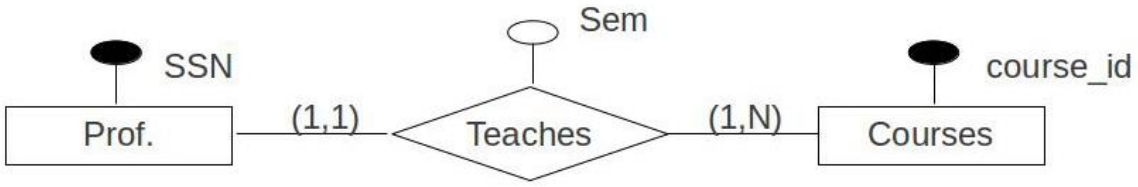
c. Every professor must teach some course.



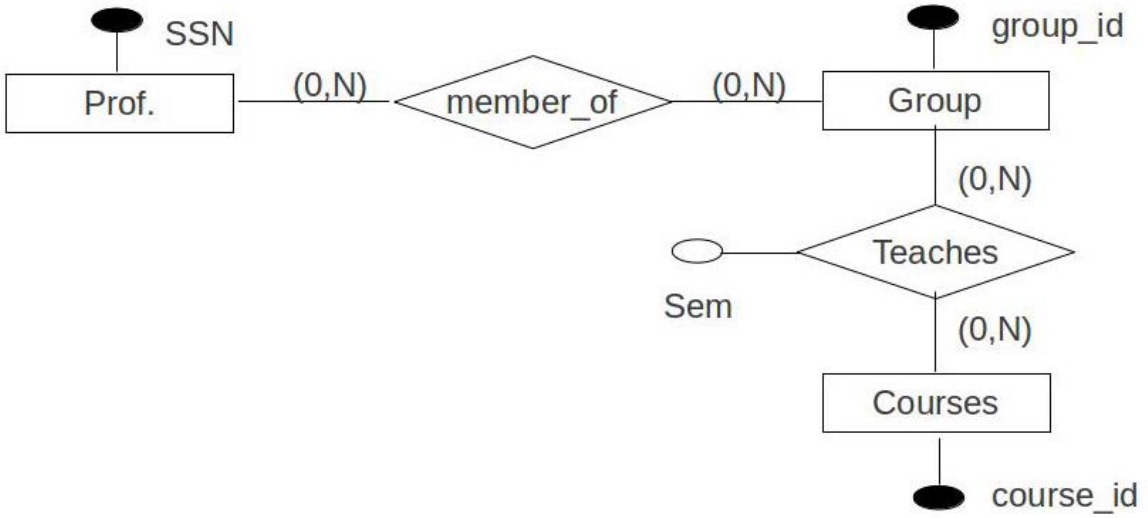
d. Every professor teaches exactly one course (no more, no less).



e. Every professor teaches exactly one course (no more, no less), and every course must be taught by some professor.

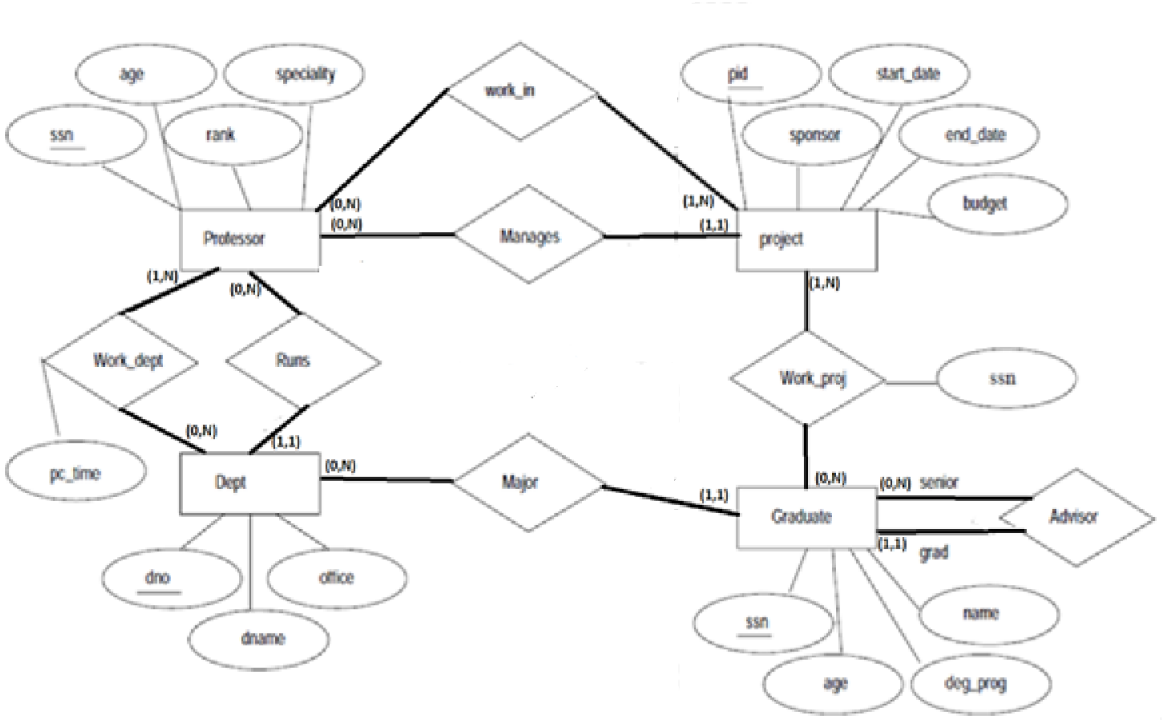


f. Now suppose that certain courses can be taught by a team of professors jointly, but it is possible that no one professor in a team can teach the course. Model this situation, introducing additional entity sets and relationship sets if necessary.



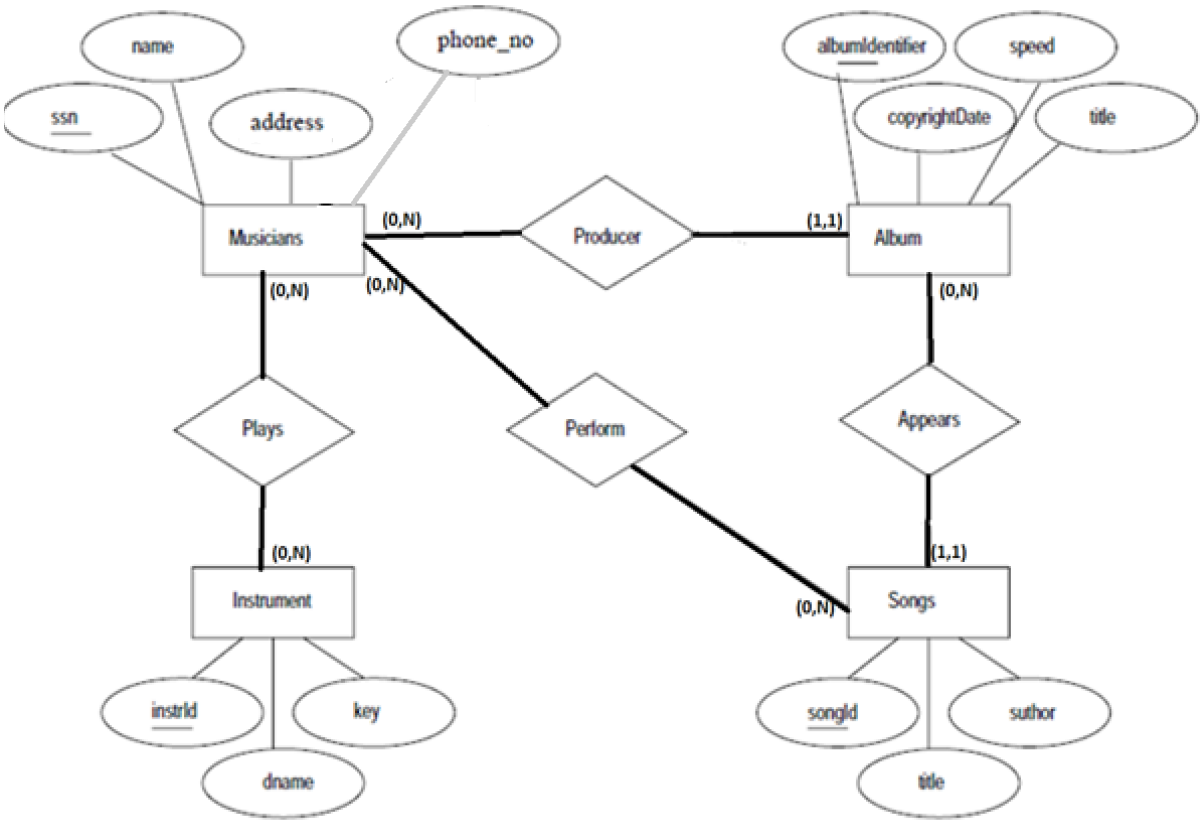
An additional entity set called Group is introduced to identify the professors who team to teach a course. We assume that only the latest offering of a course needs to be recorded.

Exercise 2) The ER diagram is shown in following figure.



Note: The relationship “Supervises” can be replaced by making “Work_proj” to be a relationship with degree 3 by adding “Professor” entity to the relation.

Exercise 3) The ER diagram is shown in following figure.



Exercise 4) The ER diagram is shown in following figure.