

Practice problems for Exam 2 on modeling database requirements from the Entity-Relationship (ER) model. See at class participation problems and solutions on Weeks 3 and 4.

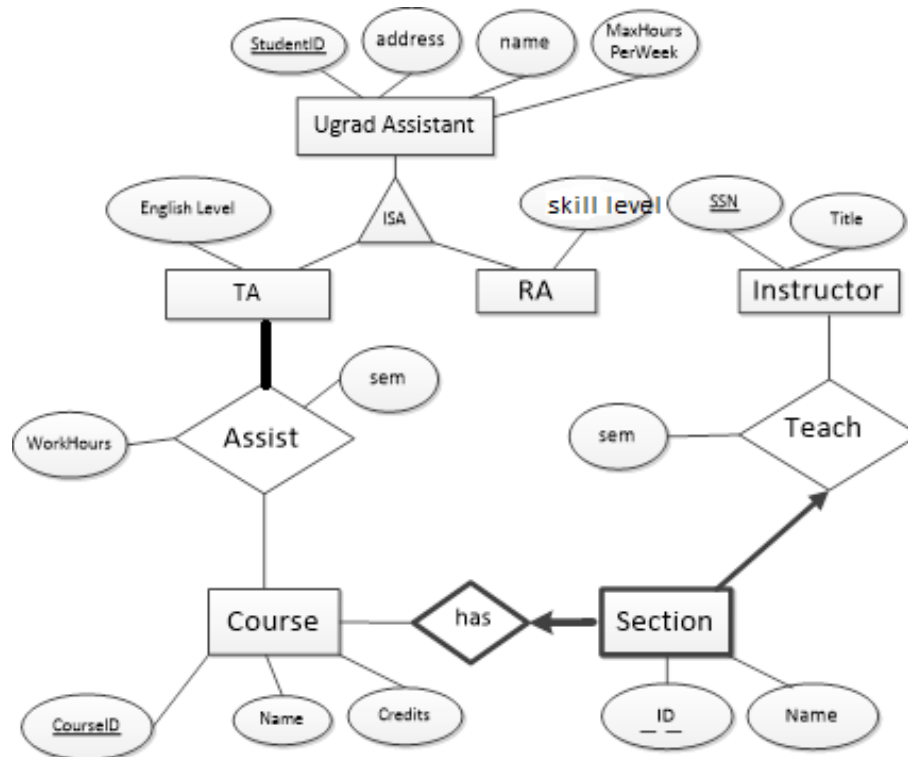
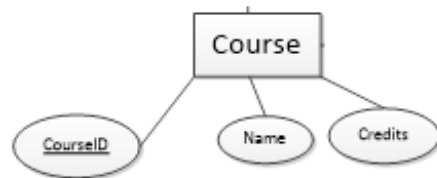
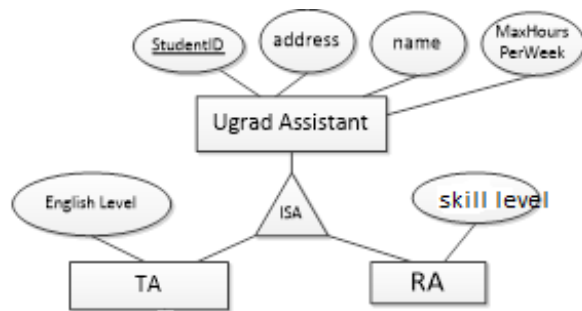


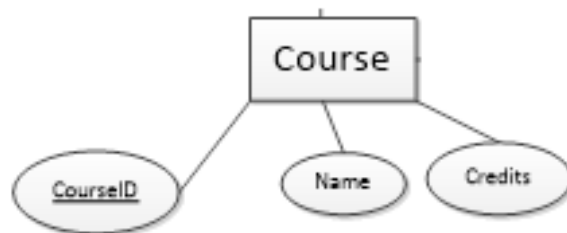
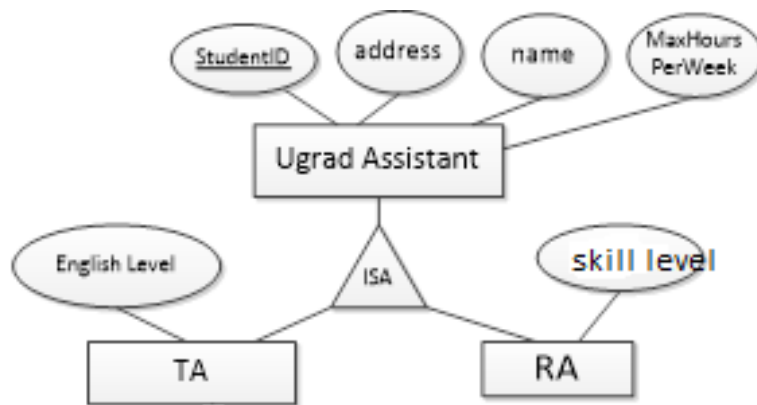
Figure 1: ER diagram of a database of teaching assistants (TA), research assistants (RA), course sections, courses, and instructors

Modify the ER diagram in Fig. 1 to model the database requirement given in each sub-question. Do not impose other constraints unless you explicitly indicate the constraints you add. Use the ER notations that we have been using in class. Use of other ER notations will receive a zero score.

- A teaching assistant (TA) assists in teaching at most one course. All TAs must assist in teaching. Record information about the semester in which a TA assists in teaching a course and the number of teaching assistant hours for that TA for that course. If a TA assists in the same course in multiple semesters, only keep the most recent semester information and the number of TA hours for that semester. Put your answer in the diagram below.



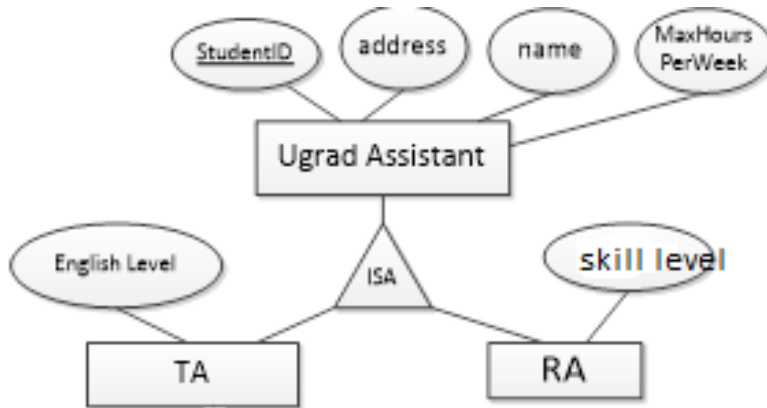
b. A new requirement asks to keep a history of which TA assists which course in which semester and for how many TA hours. The name of the semester uniquely identifies an individual semester. Put your answer in the diagram below. A teaching assistant can assist several courses and a course can have several teaching assistants.



- c. A new requirement requires that a RA must be supervised by at least one instructor and an instructor can supervise zero or more RAs in one semester. Keep the most recent semester and the number of hours of RA work for that semester. Put your answer in the diagram below.



- d. A new category “TechSupport” of undergraduate assistants is added. TechSupport has all common attributes as all the undergraduate assistants do, but it also has the attribute supervisor, which keeps the name of the supervisor. An undergraduate assistant can be in more than one sub-class. Put your answer in the diagram below. There are no other sub-classes of Ugrad Assistant.



- e. Modify Fig. 1 to model the requirement that a teaching done by an instructor of a course section must be monitored by a department teaching committee. The committee ID uniquely identifies each teaching committee. Other information includes the semester in which the monitoring is done. Fig. 1 is replicated here. Add your ER notations to this figure.