Linnæus University
Sweden

Report

Assignment 1
Database Theory

Author: Khalil Mardini & Nima Safavi
Supervisor: Ilir Jusufi
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1. Movies DB (FDs 3.28)

1. False, based on the E/R diagram which shows zero-to-many multiplicities, there might be an actor that has not played in any movie.

2. Maybe, since we have a many-to-many relationship between actors and movies, there is a possibility that some actors have performed in more than 10 movies or less.

3.True, since it is many to one relation from actors' entity set to Movie's entity set.

4. False, since it is many to one relationship, based on the diagram, the Movies entity set could have at most 1 or zero actors, the arrow which is entering the actor's entity set is proving that.

5. Maybe, the relationship "Also a director" illustrate that there is a possibly that the+ director could be an actor so we can´t say it is false, but still we don´t have enough information that a director could be the actor. So, in the case an actor wants to become a director then it's absolutely true based on the relation "Also a director".

6. False, as can be seem in the diagram, there is a one –to-one relation between Producers entity set and Actors entity set. Even the relation "Actor Producer" shows that the Producer could be an actor and vice versa

7. False, since the producer could be an actor and the actors roll is to perform in Movies. So as a result, the Producer could be an actor in some movies.

8. True, based on the diagram given, it is a many-to-many relation between the Actor and Movies entity sets who perform in Movies. The entity set Movies could show that many actors (dozens) the multiplicity arrow which goes from Movie's entity set to actors' entity set proves that.

9. Maybe, the producer could be an Actor, but still, there isn't enough information that could determine that the producer could be the director as well.

 10. Maybe, according to the diagram this statement is possible since there is a many-to-many relationship between producers and movies but we cannot be definitely sure. In other words, it is possible to have one producer who is a director at the same time.

11. True, the reason why is its many-many relations between the Movies entity set and the Producers set that's why the movies have several producers.

And regarding the directors its many-to-one relationship from the movie's entity set to the Director set.

12. True, since the multiplicity that goes from the actor entity set to Directors, Movies and Producers proves that the actors have applied these roles.

13. False, by checking the relation between movies entity set and directors entity set it is possible to have a director-actor in a movie

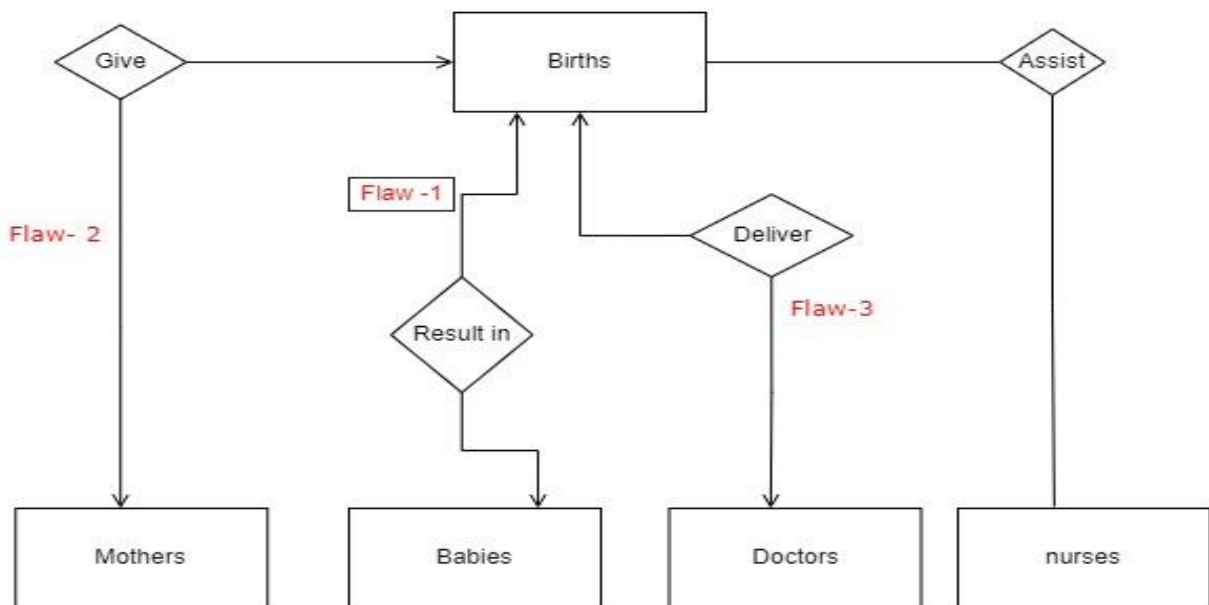# 2. Births (DBS 2.2.6 and 2.2.7)

First Scenario

Figure 1

Based on the conditions in the question, after applying requirements (1), (2), (3), in order to represent uniqueness, we use arrows (<->) between babies and births, mothers and births, doctors and births respectively in figure 1. There was no defined condition for the nurse entity set, so we just considered the many-to-many relation.

Flaws

1. A birth can give more than one baby, suppose conditions that results in twins or triplets.
2. A mother can give one or more than one birth. Therefore, we do not need one to one relationship.
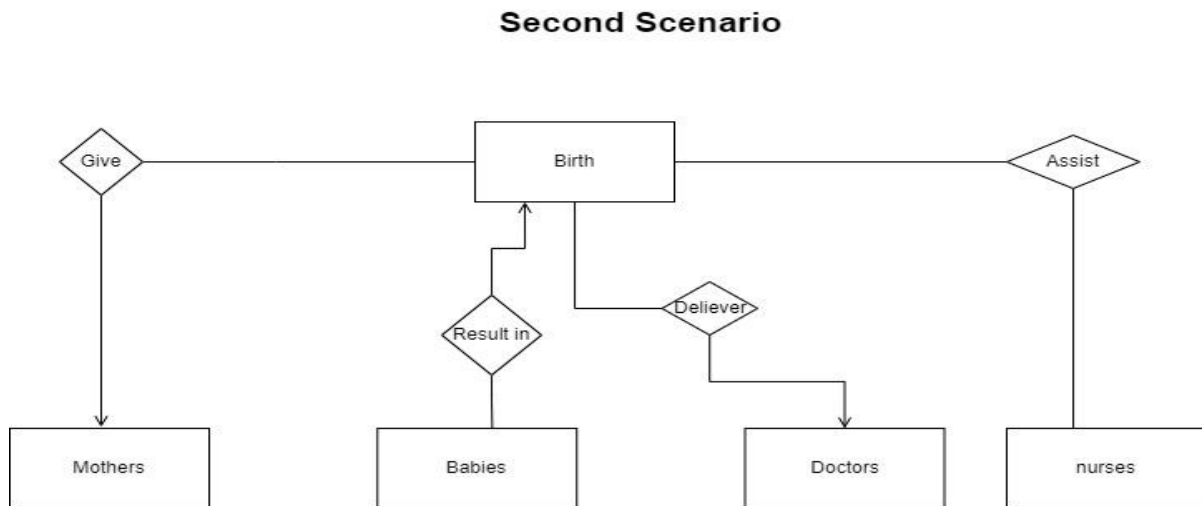3. A doctor can deliver more than one birth.

Second Scenario

Figure 2

The above figure illustrates the new design after identifying the faulty parts and revising them. Now we can see that a birth can led to more than one baby by a unique mother. At the same time, a mother can have more than one birth. Lastly, the relation between birth and doctors is updated to one-to- many.
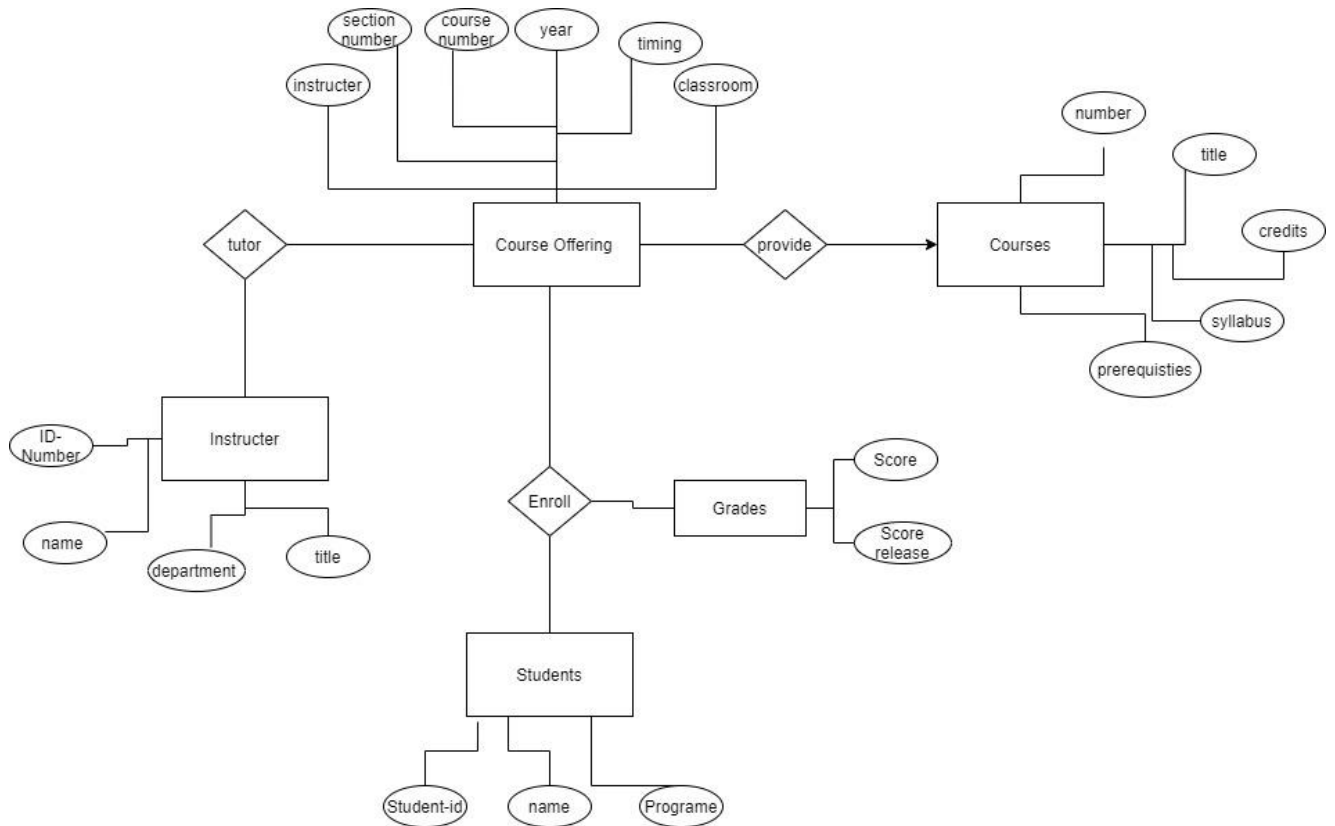
3. The registrar's office (DSC 6.2)

Figure 3

The students can be enrolled in one or multiple course offerings, thus in order to get enrolled the grades have to be presented that´s because I made the Grades as an entity set, the grades connect to Students and Course offering through the Enrol relationship.

The relationship between Instructer and Course offering entity sets are many to many since one or multiple instructors could tutor in the course offering (Note: it is possible also to have one instructor in a specific course offering, but I choose the many-to-many relationship)

Moving on, the relationship between Course Offering and Courses its many to one relation since the course offering can only provide one course to inquirer about while the course could have multiple course offering
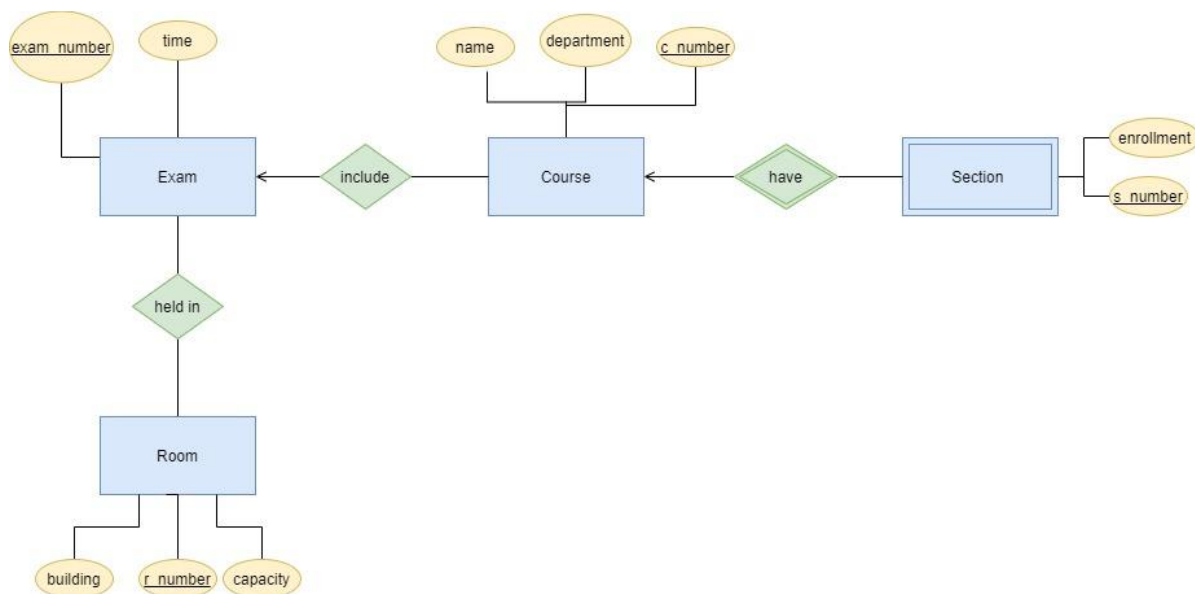
4. Classroom scheduling (DSC 6.6)

Figure 4

Explain what application characteristics would influence a decision to include or not include each of the additional entity sets.

We assumed that there will be only one specific exam that will be carried out <u>for a course</u> in this scenario, So the course entity set needs to have only one exam. Moreover, the course entity set could have one or many sections for instance there are many courses which have the same syllabus but different section number (an example of that 1DV513 and 2DV513) also the section have only one

course (Note: the reason that section entity set has one course is that we are considering to carry out exam for one specific course,

The Exam could be held in one-to-many rooms depending on the number of students attending the exam, the reason why is there might be a chance that the room doesn't fit the number of students so in this case we consider to held in the exam in one room or more.

We have included the exam_number attribute and set it as a primary key since its significant.

By adding the additional new entity sets, rather than leaving them as an attribute we get more functionality for the Exam E/R diagram, at the same time it gives wider understanding of how the exam process goes through.

The primary attributes in the E/R diagram above illustrate the main keys to define each entity set.