DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE (IDA)
DIVISION FOR DATABASE AND INFORMATION TECHNIQUES (ADIT)

Database Technologies

Assignment: Database Design

Objective

The objective of this assignment is to practice designing a relational database for a given example domain by first creating a conceptual schema using the EER model and then translating this schema into a corresponding logical schema captured in the relational data model.

Background Reading

Lecture notes and book chapters about EER modeling and about the mapping of EER diagrams to relations.

Introduction

Your old friend from high school has won the lottery and wants to use the money to make her dream come true: building a TV company! She figures that she needs a database to record information about the TV series that her company is going to produce. "Sure," you say, "let me help you!"

After meeting and discussing with your friend, you have identified the following data requirements for an initial version of the database.

- The database has to store data about TV series. Each series has a unique title and, additionally, a budget. Each series contains episodes.

- Episodes are considered only within the context of the series to which they belong; each episode of a series has a name that is unique among all the episodes of the series. (hint: use a weak entity type)

- The database has to store data about two types of persons: actors and directors. Each of them has a unique personal number and a name that is composed of a first name and a last name. Moreover, persons may have nicknames (zero, one, or more). For actors we additionally want to record their rating.

- Actors may participate in series. For each of the series that an actor participates in, we want to record the amount of payment that the actor receives for participating in that series.

- Each episode of a series is directed by one of the directors, but different episodes may be directed by different directors. Similar to the actors, directors receive payment for each directed episode, where the amount may be different for different episodes. We want to record the amount of payment they receive for each episode.

Task 1

Draw an EER diagram that captures the aforementioned data requirements. Use the notation as introduced in class. Make sure to also include relevant constraints in your diagram; that is, include cardinality constraints and participation constraints for the relationship types, as well as totalness constraints and disjointness constraints for specializations. If you make choices and add constraints for aspects that are not explicitly specified in the given data requirements, clearly write down the choices and assumptions that you make.

Task 2

Translate your EER diagram into a relational database schema by using the procedure introduced in class. Your answer should be given in the form of a diagram that presents the relation schemas, including primary keys and foreign keys; for an example, see the diagram on slide 17 ("Diagramming Referential Constraints") of the second slide set in the lecture material.

Handing In

- An PDF file with a picture of the EER diagram (task 1).

- A text file (or a PDF file) with notes regarding the additional choices and assumptions you have made when creating your EER diagram.

- An PDF file with a picture of the diagram that presents your relational database schema (task 2).

You may draw the diagrams offline on a sheet of paper, in which case your PDF files may be photocopies of the papers or (high resolution) photos of the papers. Alternatively, you may use some software for drawing diagrams, in which case you can hand in PDF files exported from this software. However, if you use such a software, remember that your EER diagram has to be based on the notation introduced in class.