

Introduction to Database Systems

Homework 1

This set of exercises will be helpful in preparing for the midterm. They are intended to encourage you to become familiar with the entity-relationship approach to high-level database design.

The textbook exercises are given at the end of the section of interest. For example, textbook exercises 4.1.3 and 4.1.4 are on page 139.

1. Textbook exercise 4.1.3 (basic E/R from English)
2. Textbook exercise 4.1.4 (extending an E/R diagram with further relations); you can skip part (c)
3. Textbook exercise 4.2.5 (design principles, constraints)
4. Textbook exercise 4.2.6 (more design principles, introducing new concepts)
5. Textbook exercise 4.3.2 (keys of relationships)
6. Textbook exercise 4.4.3 (weak entity sets)
7. Pick a domain from your own experience, describe it in English, and then develop an E/R diagram for it. Alternatively, interview someone about a domain in their experience (and not yours) and create an E/R diagram for it.

Other Problems to Learn More (Not Graded)

Convert the RWB FEC data schemas (from the first project, see [~pdinda/339/HANDOUT/rwb/fec/ora](http://pdinda/339/HANDOUT/rwb/fec/ora) and the data dictionaries on the FEC web site) to an ER diagram (SQL to ER, including keys, various forms of relationships, and constraints, including referential integrity)

The Unified Modeling Language (UML) is a widely used graphical modeling language that can be used to design database schemas. Read about UML and compare and contrast it with the Entity-Relationship model. Your textbook has an introduction to UML and there are many other sources available.

Read further about NoSQL distributed databases and differentiate between the following models: column store, key-value store, and array database. Also define and differentiate between these terms: consistency model, eventual consistency, ACID, BASE, CAP.