

Introduction to Database Systems

Problem Set 1

Due: January 14, 2016 at 11:59 PM

You are designing a database for a library to keep track of the books that are presently signed out. It has the following requirements:

- Books have a title, author, edition, publication date, and page count. A book may be signed out for 14 days at a time. The library may have more than one copy of a book.
 - Borrowers have a name, dob, address, and phone number. A borrower may sign out one book at a time, but may have none. For this exercise assume that no two borrowers share a name.
 - Borrowers may also sign up for computer time and they may make up to three reservations at a time. Each library computer has an identifier and room number. For a user to reserve a machine, they must provide a start time, end time, and computer number. A computer cannot be double booked.
1. List the entity sets and relationships associated with the library's database. Do any of these sets need an additional attribute for a primary key identifier?
 2. Create an entity-relationship diagram for this system. Clearly show the relationships as 1:1, 1:many, or many:many. Be sure to underline the primary key in each entity set.
 3. Translate your E-R diagram into a set of relations.
 4. Design a set of constraints for the library's database.
 5. 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 expertise (and not yours) and create an E-R diagram for it.