

CS 377: Database Systems

Sample Midterm Questions

Question 1.

Consider a database schema with the following relations:

Suppliers(sid: integer, sname: string, address:string)

Parts(pid:integer, pname:string, color:string)

Catalog(sid:integer, pid:integer, cost:real)

Please write the following SQL queries

1. Find the sids of suppliers who sell a 'red' part that costs more than 100. Your query should not return duplicates.
2. An expensive part is a part that has cost greater than 100 from some supplier. Find the sides of those suppliers who sell at least one such part.
3. For each supplier that sells at least one expensive part, return the sid and the total number of expensive parts that the supplier sells.

Question 2. Suppose that you are asked to write a database application that captures the following information:

We want to store information about books. Each book has a title, a price, and an ISBN number. The ISBN number uniquely identifies the book. Some books are children's books. Each children's book also specifies the minimum age and the maximum age, which together indicate the ideal age range for its readers. Some books are educational books. Each educational book specifies the grade, that is, the school grade that the book is most suited for. Each educational book may also be associated with one or more multiple exercise CDs. Each CD has a name and a length (in minutes). We can only uniquely identify each CD using its name and the information of the book that the CD is associated with. Each book is written by one or many authors. Each author has an author ID, a name, and multiple addresses. Each book is also published by exactly one publisher. Each publisher has a name (which uniquely identifies the publisher) and a single address. When a publisher publishes a book, we want to record the publishing year and the quantity (that is the number of copies that the publisher produces).

1. Draw an ER diagram for this application. Decide the key attributes and identify those. Note the cardinality ratio constraints and the participation constraints.
2. Convert the above ER diagram into relational schema. Specify the primary key of each relation in your schema.