COP 4710 – Database Systems – Spring 2004

Practice Problems for Mid-Term Exam

Problem #1 - Queries

Use this sample database:

s (s#, name, rank, city, workers)
p (p#, name, color, weight, city)
j (j#, name, workers, city)
spj (s#, p#, j#, qty)

where: in s: rank is a numeric field, and workers is the number of employees of that supplier.
in p: city is the city in which the part is built.
in j: workers is the number of workers on that job.

- Write both a relational algebra expression and a tuple calculus expression that correctly answers the query: List the names of those suppliers who both job number J1 and J2 with any part.

- Write both a relational algebra expression and a tuple calculus expression that correctly answers the query: List the job numbers for those jobs that are supplied by supplier number S1 with every part that supplier S1 supplies.

Problem #2 – ER Diagram

Construct an ER diagram for the following situation.

A hospital has a large number of registered physicians. Attributes of physicians include an id number and specialty. Patients are admitted to the hospital by physicians. Attributes of patients include a patient id and name. Any patient who is admitted must have exactly one admitting physician. A physician may optionally admit any number of patients. Once admitted, a given patient must be treated by at least one physician. A particular physician may treat any number of patients, or may not treat any patients. Whenever a patient is treated by a physician, the hospital wishes to record the details of the treatment which include the date, time, and results.