

Computer Science 455

Second Hour Exam

Name _____

The supplier-parts-projects (SPJ) database:

s(sno, sname, status, city)

p(pno, pname, color, weight, city)

j(jno, jname, city)

spj(sno, pno, jno, qty)

You will also need

Emp(eno, ename, salary, super)

As described in the first problem.

Friday, March 25, 2005

100 pts.

I. Some SQL DDL

- a. (10 pts.) Write the CREATE TABLE statement in SQL for the EMP table with the following fields **and constraints**:

ENO – a character field of length 5: The key of this relation

ENAME – a character field of length 10

SALARY – a numeric field (annual salary) of length 6

SUPER – The employee number (ENO) of this employee's supervisor. This is a foreign key referencing ENO of this table.

- b. (5 pts.) Create a non-unique index over the SUPER field.

(continued on the next page)

- c. (10 pts.) In talking about data normalization, we discussed why it would not be a very good idea to combine the supplier (S) table and the SPJ table. Suppose, however, that we want to offer this convenience to a user. Define a view called SSPJ which contains the information in the SPJ table together (for each SNO value in the table) the corresponding SNAME, STATUS, and CITY fields. The view should have the following relational schema:

SSPJ(SNO, SNAME, STATUS, CITY, PNO, JNO, QTY)

- c. (5 pts) What is the difference between doing this and using the CREATE TABLE ... AS SELECT command?

- f. Now consider the relation $R(A, B, C, D)$ with functional dependencies
 $(A, B) \Rightarrow C$ and
 $C \Rightarrow D$.
- i. (5 pts.) Draw a functional dependency diagram (as we have done in class)
- ii. (5 pts.) Identify the key of R
- iii. (5 pts.) Identify a normalization violation in R (2NF or 3NF), identifying the problem.
- iv. (5 pts.) Decompose R into fully normalized relations (a lossless decomposition). Give the relational schema for the derived relations.