

Database and Information Systems

Homework 2

September 18, 2003; Due September 25 at 1:30 PM

For this assignment, please begin by signing up for an Oracle account, which should be accessible from **eniac**. (For those who do not have eniac accounts, please email the instructor.) Then read over the Oracle setup instructions from the course web page and modify your eniac **.cshrc** file as directed. Also read over the Oracle guide referenced from the course web pages. Finally, download **hw2.sql** to your eniac account, launch Oracle (using the command **sql**), and then **start hw2** to create some sample tables for Problems 1 and 2. These will only be sparsely populated — to test your solutions, you may need to INSERT more VALUES into the tables.

*Reminder: the SQL string datatype is **VARCHAR(length)**, and you'll need to choose an appropriate length.*

Problem 1: Consider the following schema:

```
Supplies(sid: integer, sname: string, address: string)
Parts(pid: integer, pname: string, color: string)
Catalog(sid: integer, pid: integer, cost: real)
```

Write the following SQL queries:

1. Find the *pnames* of parts for which there is some supplier.
2. Find the *snames* of suppliers who supply every red part.
3. Find the *pnames* of parts that are supplied only by Acme Widget Company.
4. Find the *sids* of suppliers who charge more for some part than the average cost of that part.
5. Find the *sids* of suppliers who supply only red parts.
6. Find the *sids* of suppliers who supply a red part or a green part.
7. For every supplier that supplies a green part and a red part, print the name and price of the most expensive part that the supplier supplies.

Problem 2: Consider the following schema. An employee can work in more than one department. The percentage of time that a given employee spends in a given department is shown by the *pct_time* field.

Empy(eid: integer, *ename*: string, *age*: integer, *salary*: real)
 Works(eid: integer, *did*: integer, *pct_time*: integer)
 Dept(*did*: integer, *budget*: real, *managerid*: integer)

Write the following queries in SQL:

1. Given a department, we can consider part-time employees to be “fractional full-time-equivalent” employees based on the *pct_time* they work in the department (so two employees who work in a department 50% of the time will be counted as one full-time-equivalent employee) — the total number of full-time-equivalent employees is the sum of all full-time employees plus the (truncated) sum of “fractional full-time-equivalent” employees. For each department with more than 20 full-time-equivalent employees, print the *did* together with the number of employees who work in the department.
2. Find the *enames* of managers who manage only the departments with budget larger than \$1 million, but at least one department with budget less than \$5 million.

Problem 3: Consider the following relations:

Student(snum: integer, *sname*: string, *major*: string, *lvl*: string, *age*: integer)
 Class(name: string, *meets_at*: char(5), *room*: string, *fid*: integer)
 Enrolled(snum: integer, *cname*: string)
 Faculty(fid: integer, *fname*: string, *deptid*: integer)

The key fields are underlined. Write the SQL statements required to create these relations, including appropriate versions of all primary and foreign key integrity constraints.