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INFSCI 2710 "Database Management" — Homework #5: Advanced Algebra, SQL*Plus —

Reading Assignment:

Please read the following chapter from the book by Elmasri and Navathe (3rd Edition):

- Chapter 7, "The Relational Model, relational Constraints, and the Relational Algebra" (43 pages). You do not have to read 7.4.7 "Division", 7.5.1 "Aggregate Functions and Grouping", 7.5.2 "Recursive Closure Operations".
- Section 8.2, "Basic Queries in SQL" (10 pages).

Exercise 5 — 12 Points

Consider Oracle's example database with information about employees and departments (the tables are printed on slides 2-5 and 2-9):

- `DEPT(`<u>`DEPTNO`</u>`, DNAME, LOC)`
- `EMP(`<u>`EMPNO`</u>`, ENAME, JOB, MGR`^{o}`→EMP, HIREDATE, SAL, COMM`^{o}`, DEPTNO→DEPT)`

Please formulate the following queries in relational algebra:

a) Which department has no employees? Print number and name of the department.

b) Who are the managers of the research and the sales department? Print their employee number and name.

Write the following queries in SQL. You must run them in SQL*Plus and submit a printout showing the queries and their output. The easiest way to get everything in a file is to the command `SPOOL file` in SQL*Plus before you start with the queries, and `SPOOL OFF` when you are done. Then "`file.lst`" will contain the transcript of your session.

c) Print all employee names with four letters.

d) Print name, number, salary, and department of all employees who work in department 10 or 30 and earn less than $1500. Make sure that both conditions are really satisfied.

Finally, do the following exercise with SQL*Plus:

e) Enter three incorrect SQL queries, for which SQL*Plus prints three different error messages. Please explain what the error is (in 1-2 sentences, maybe handwritten on the printout). This exercise is worth 4 points.

Due Date:

Please submit your solution on next Wednesday (February 16) before the lecture.