Tutorial 6 SQL CZ2007

Classroom Exercise

1. The schema of a database containing university-type data is given below.

Primary key is bold for each relation.

STUDENT(**Sid**, Sname, Sex, Age, Year, GPA)
DEPT(**Dname**, Numphds)
PROF(**Pname**, Dname)
COURSE(**Cno**, Cname, Dname)
MAJOR(**Dname, Sid**)
SECTION(**Dname, Cno, Sectno**, Pname)
ENROLL(**Sid**, Grade, **Dname, Cno, Sectno**)

Write the following queries in SQL.

(i) Find the names of professors who work in departments that have fewer than 50 PhD students.

(ii) Find the names and majors of students who have taken the 'Database System' course.

(iii) Find the ids, names, and GPAs of the students who have taken all courses from the 'Civil Engineering' department.

2. Suppose we are maintaining a database of articles published in our newspaper, the Straits Times. We have the following schema (where keys are underlined):

Article (issueID, articleID, author, title)

Citation (articleID, issueID, citedArticleID, citedIssueID)

WordAppears (wordID, issueID, articleID, position)

WordIs (wordID, wordText)

Issue (issueID, date, howManyDistributed)

Assume that dates can be compared using comparison operators (<, >, =). Assume that position is an index specifying where the word appears (1 = first word, 2 = second, etc.). Write the following query in SQL.

Find the documents in which the words "politician" and "corruption" appear.

3. Consider the relation R(A,B,C,D) with candidate keys AC and D. What will be the output of the following query? Justify your answer.

```
SELECT A, B
FROM R
WHERE C > (SELECT D FROM R WHERE C = 3);
```

Critical Thinking Exercise

4. Let R=(A, B, C), S=(C, D, E) be two relational schema. Let q and r be relations (i.e., tables) on schema R; and s be a relation (i.e., a table) on schema S. Convert the following relational algebra queries to SQL.

(i) $q - r$

(ii) $\Pi_{A, C}(r) \bowtie \Pi_{C, D}(s)$