Tutorial 6 (SC2207-CZ2007)

SQL

Classroom Exercise

1. Write SQL statements for the following queries.

The schema of a database containing university-type data is given below. Primary key is underlined 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.
(1) Find the names of professors who work in departments that have fewer than 50 PhD students.
(2) Find the names and majors of students who have taken the 'Database System' course.
(3) Find the title, department and cno of courses that were taught by different professor at different Sectno.

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)

For each of the following queries, write the query in SQL. 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.).

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

3. For the following relational schema:

employee (employee-name, street, city)

works (employee-name, company-name, salary)

company (company-name, city)

manages (employee-name, manager-name)

Give an expression in SQL for each of the following queries:

Find the names of all employees in the database who live in the same cities and on the same streets as do their managers. Assume that all people work for at most one company. Each company has at most one manager, who is also an employee of the same company.

4 Consider the following schema

Likes (Drinker, Beer)
Frequent (Drinker, Beer)
Serves (Bar, Beer)

Write a single SQL to find all drinkers that frequent some bar that serves some beer they like

Critical Thinking Exercise

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