**Assignment 2**

**Query Tuning**

**Database Management and Performance Tuning**

In this assignment you will gain hands-on experience in rewriting slow queries and in experimentally evaluating the rewritten queries.

*Task 1:* Create a database with the following database schema:

*•* Employee(ssnum,name,manager,dept,salary,numfriends)

**–** unique index on ssnum

**–** unique index on name

**–** index on dept

*•* Student(ssnum,name,course,grade)

**–** unique indexes on ssnum

**–** unique indexes on name

*•* Techdept(dept,manager,location)

**–** unique index on dept

**–** a manager may manage multiple departments

**–** a location may contain multiple departments

*Task 2:* Fill the database with 100*k* employees, 100*k* students, and 10 technical departments. Only about 10% of the employees are in a technical department. The types of the attributes should make sense (e.g., ssnum should be an integer), but the values need not be meaningful (e.g., names can be random strings).

*Task 3:* Choose two types of queries that might be hard for your database to optimize. Taking queries from the lecture notes is OK.

*NOTE:* For at least one of your queries rewriting should make a difference.

*Task 4:* Rewrite the queries and consult the execution plans of the original and the rewritten query.

*Task 5:* Run the original and the rewritten query and measure the runtime.

*Report:*

*•* Describe your instance (data types, how did you fill the tables?).

*•* Give the original and the rewritten queries.

*•* Show and explain the execution plans.

*•* Report and briefly discuss the runtime results from your experiment.

Please indicate the time that you spent solving this assignment in your report. The time that you indicate will have *no* impact on your grade.