Homework One

SQL using mSQL

Out February 29, Due March 14

1 mSQL

mSQL is a lightweight database engine designed to provide fast access to stored data with low memory requirements. Although mSQL only supports a subset of SQL (no views, sub-queries etc.), everything it supports is in accordance with the ANSI SQL specification. The mSQL package includes the database engine, a terminal "monitor" program, a database administration program, a schema viewer, and a C language API. The API and the database engine have been designed to work in a client/server environment over a TCP/IP network. You have been provided with a user's manual and additional information is available from the CMSC461 web page.

The mSQL system has been installed on the SGIs in the `cs.umbc.edu` domain and the server should always be running on both `cujo.cs.umbc.edu` and `retriever.cs.umbc.edu`. If it does not appear to be running, please send me mail right away. We have also installed the client programs on the `gl.umbc.edu` domain. You can specify which server a client connects to using the `-h` flag (e.g. `-h cujo.cs.umbc.edu`.

We have created a database for you to use with your userid as its name on just **one** of these machines. Try running the `relshow` command to find out which server your database is on. Only you have read or write privileges for this database. If you are unable to access it, please let us know as soon as possible (e.g., send email to finin@gl.umbc.edu). You should use this database to represent all of the tables in this assignment. If you are interested in looking at the source code for mSQL or in accessing the library functions, see `/usr/cs/msql/` on any of the SGI's in the CS domain (e.g., retriever.cs.umbc.edu).

2 The suppliers, parts and shipments database

Create the *suppliers-parts-projects* tables in your database. You can extract the data from the rdb version (spj.rdb) used in the first homework. Write SQL queries to answer the following queries against the *suppliers-parts-projects* tables you created. If a query can not be done with mSQL say so and explain what limitations prevent you from doing it in mSQL.

1. Get the supplier names for all suppliers who supply project j1.
2. Find triples of suppliers, projects and parts such that all three are located in the same city.
3. Get the names of parts supplied by a supplier in London.
4. Get project numbers for projects using at least one part available from supplier s1.
5. Get the supplier names of suppliers who supply no parts.
6. Get project numbers for projects not supplied with any red parts by any London suppliers.
7. Get supplier numbers for suppliers who supply the same part to all projects.
8. Get part numbers for parts that are supplied either by a London supplier or to a London project.
9. What is the average weight of a screw?

10. Which part is the heaviest?
11. Show the names of suppliers who supply all projects.

3 University Database

Use mSQL to implement your design for the "university" database of the first homework and populate it with your sample data. Show the mSQL commands used to define the database.

department(Dcode, Dname, Chair)	*course(Dcode, Cnum, Title, Units)*
prereq(Dcode, Cnum, Pcode, Pnum)	*class(Classnum, Dcode, Cnum, Instructor)*
faculty(Ssn, Fname, Dcode, Rank)	*student(Ssn, Sname, Major, Status)*
enrolled(Class, Student)	*transcript(Student, Dcode, Cnum, Grade)*

Notes:

- Primary keys are underlined.
- Values of *Course.Dcode*, *Faculty.Dcode* and *Student.Major* are from *Department.Dcode*.
- Values of (*Prereq.Dcode, Prereq.Cnum*), (*Prereq.Pcode, Prereq.Pnum*), (*Class.Dcode, Class.Cnum*) and (*Transcript.Dcode, Transcript.Cnum*) are from (*Course.Dcode, Course.Cnum*).
- Values of *Department.Chair* and *Class.Instructor* are from *Faculty.Ssn*.
- Values of *Enrolled.Class* are from *Class.Classnum*.
- Values of *Enrolled.Student* and *Transcript.Student* are from *Student.Ssn*.

Write mSQL queries to answer the following queries against your database. If a query can not be done with mSQL say so and explain what limitations prevent you from doing it in mSQL. Show the result returned for each query.

Queries

1. The names of departments that do not offer any classes.
2. The SSNs of students that are enrolled in all the classes taught by Professor Turing from CSEE Department.
3. The SSNs of students and the courses (department codes and course numbers) where the student is enrolled in the course but does not have the prerequisites.
4. The names of department chairs that do not teach any courses.
5. The SSNs of students currently taking courses outside their major department.
6. The SSNs of graduate students not enrolled in any class.