CS 445 Database Assignment #1

E-R Diagram: Due: Sept 26, 2011, 5:00 pm   8 points
Database & Queries Due: Oct 3, 2011, 1:00 pm   12 points

For this assignment, you are to produce an E-R diagram for the database described below. After that you are to build the database in MySQL (in PUNetID_AssignmentOne on gray.cs.pacificu.edu). Finally, you are to write SQL queries to answer the questions listed below.

You are encouraged to schedule an appointment with me to review your E-R diagram before the due date. Be sure to have an electronic copy of your diagram on Turing (not on a USB drive). Also bring a paper copy of the diagram. Make sure your E-R diagram will allow you to answer the queries listed below!

The Problem

You have been hired to design a database for a computer software company. The company sells various software products to various clients. The company wants you to build a database that will all the company to track its employees, clients, software products and the interactions between them. Employees have a first and last name, email address, phone number and salary. An employee can work on multiple software products. An employee, however, can manage only one software product. Each software product must be managed by a single employee, and has a name and current version (of the form #.##). The company only cares about the most recent version of the software (clients receive automatic updates). Some software products the company sells depend upon other software products the company sells. No software product depends on third party software. Clients have a phone, email, first and last name, and date of first contact with the company. The company likes to reward long-time customers occasionally. A client may use many software products but is removed from the database if they quit using all software products (and hence lose and long-time customer standing). A single employee is marked as the Point of Contact for each customer/product pairing. A different employee may be assigned to as Point of Contact for the same software product for different customers, and vice versa.

The Data
Once you build your database you need to fill it with the posted data!

The Database

Build appropriate indexes to support the queries. Be sure to use the proper constraints (FOREIGN KEY, PRIMARY KEY, UNIQUE) as necessary.

The Queries

You must be able to answer all of the following queries using your data model. The required output is listed.

1. List all of the employee's first and last names. (First Name, Last Name)
2. List all software products (Name)
3. List all employees with a salary of greater than $60,000 (First Name, Last Name, Salary)

4. List all products with a current version greater than 1.0 and First Name starting with S. (Name)
5. List the name of all employees that manage a product (First name, Last Name).
6. List the name of all employees that manage a product whose salary is less than $60,000 (First name, Last Name, Salary).
7. List the name of all employees that manage a product and the name of the product they manage (First name, Last Name, Salary, Product Name).
8. List the Name of all clients that have been with the company since before 10-10-10 and the products they use (First Name, Last Name, Product Name, Start Date).
9. List the Name of all clients that have been with the company since before 10-10-10 or who started with the company since 1-1-11 and the products they use (First Name, Last Name, Product Name, Start Date).
10. List all employees ordered by salary (First Name, Last Name, Salary).
11. Find the average salary for all employees who manage a product (Average Salary).
12. Find the average salary for all employees who are a point of contact for the "Stellar Teller" software product. (Average Salary)
13. Find the maximum salary for employees who work on software with a version number of 1.0, 2.0, or 3.0 (version number, salary: return three rows, one per version number).

The Submission

You must produce the E-R diagram in Visio and hand in a hard copy on time.

Your database must be done in PUNetID_AssignmentOne on gray.cs.pacificu.edu. The database must be built and the data loaded by the due date. Do not access this particular database until you receive your grade for this assignment. You may continue to access PUNetID_test.

You must print out the SQL statements to answer each query as well as the result of running the query and hand in a hard copy when the database is due.

Additionally, you need to submit an electronic copy of the Visio diagram (PUNetID_AssignmentOne.vsd), SQL Query statements (a text file named PUNetID_AssignmentOneQ.sql), and a full copy of the database produced by mysqldump (PUNetID_AssignmentOneDB.sql) in a file named PUNetID_AssignmentOne .tar.gz. Submit this file to the drop box on Turing (CS445Drop)

Notes

Start early! You have plenty of time but errors in the E-R diagram may complicate or make impossible some of the queries.

Ask questions! Don't assume!

I am not giving you the data in electronic format so as to not constrain your database implementation.

In my experience, writing the queries is significantly harder than creating the E-R diagram or implementing the database.

Good Luck!