

Homework 3

CMP 420 & CMP 758 - Database Systems

Spring 2022

In this homework assignment, you will be practicing writing SQL queries as discussed in Chapter 6 (Basic SQL) and Chapter 7 (Advanced SQL). To complete the assignment, we will be using the company database we have been using in our lectures.

Due Date: April 14, 2022

Part 1

For this part, you are required to create the company database schema and its relations (tables). The queries for creating the company database have already been written for you. Those queries are placed in [this folder](#). You need to follow the following steps to create the company database using the provided queries.

- **If you know how to use the command line, use the following option:**

1. Check to see if you have MySQL added to the command line path in your computer system by running the following in the terminal:

```
mysql --version
```

- o If you get the MySQL version, then it means you have MySQL already to PATH environment variable.
- o If you **do not** get the above reply, then it means you need to set up an environment path for MYSQL on your Computer. You need to follow the following instructions to create a path for MYSQL:
 - a) On windows, please follow these instructions
<https://dev.mysql.com/doc/mysql-windows-excerpt/5.7/en/mysql-installation-windows-path.html>
 - b) On Mac OS X, please follow these instructions (Please skip the installation if you already installed MYSQL):
<https://overiq.com/installing-mysql-windows-linux-and-mac/>
 - c) On Linux, you already know how to do this.
- 2. Next, you need to download the [directory that contains the queries for creating and populating the company database](#).
- 3. Extract the zipped directory you just downloaded so that you can be able to use it.
- 4. Manually go through the contents of this folder. You will notice that there are three files for each table in this directory. For example, for the DEPARTMENT table the three files are:
 - o department.sql: contains the SQL Create Table statement to create the table.
 - o department.dat: contains data for the table to be loaded using the MySQL load command.
 - o load-department.sql: contains the LOAD command to load data into the table.

The file, source.sql, contains MySQL "source" commands to execute the "create table" and "load" commands for each table.

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Please go through the above files to see the SQL queries for creating and populating tables.

5. Next, you need to navigate to the above directory (You will notice that upon the extraction, this folder is called company) using the command line (terminal). For example, using cd.
6. Once you have done the above step, type the following command in the terminal so that you can be able to access MYSQL through the terminal.

```
mysql -u <YOUR_MYSQL_USERNAME> root -p <YOUR_MYSQL_PASSWORD>
```

For example: mysql -u root root -p Password

7. Once you are connected to your MYSQL, you will need to create the company database schema. Use the following command to do that:

```
CREATE DATABASE IF NOT EXISTS company;
```

8. You now need to change to the company database you have created above. To do that, please use the following command:

```
use company;
```

9. Foreign Key Check in MySQL can prevent you from making some database updates to tables that have foreign key constraints. In such cases, you can temporarily disable foreign key check in MySQL, make your updates and enable foreign key check in MySQL afterwards. Here's how to disable foreign key constraint in MySQL.

To disable foreign key checks, please run the following command:

```
SET foreign_key_checks = 0;
```

10. After signing into MySQL and changing to "company" database, simply run the following command to create and populate the tables:

```
source source.sql;
```

11. To enable foreign key checks, please run the following command:

```
SET foreign_key_checks = 1;
```

12. Now you need to verify if you have all the tables installed and populated with data. Please run the following query to see if you have any data in the table. You need to run such a basic select statement on all the tables in the database. If you are not

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getting any data from some table, then it means the data was not properly loaded. You will have to redo step 8 through 11.

SELECT * FROM employee;

13. If you have completed all the above steps, go to Part 2

- **If you do not know how to use the command line, use the following option:**

1. Copy and paste the commands that are in this file into your MYSQL Workbench and execute them.
2. Next, you need to load the for your database tables based on the data that is in this directory. The data is contained in the file that have the extension .dat. You may have to write insert statements or place your data into a CSV file so that you can import it into the table you create from step 1
3. If you have complete the above steps, go to Part 2

Part 2

Write the following queries in SQL on the COMPANY relational database schema. All your queries should be placed in file called hw3sql.sql. Your sql file should have your name as a comment. [Here is a sample of what I would like you to have in your hw3sql.sql file](#). You will also need to submit a screenshot of the results of each query. The first question is being used as example.

- 1) Retrieve all last names of all employees.
- 2) Write an insert statement to add your name (the name you have listed on CUNYfirst) to the employee table. For the SSN field, please make up a **fake SSN** such 123456789. **DO NOT USE your real SSN.**
You can choose any department you want for your information.
- 3) Retrieve the names of all employees in department 5 who work more than 10 hours per week on the ProductX project.
- 4) List the names of all employees who have a dependent with the same first name as themselves.
- 5) Find the names of all employees who are directly supervised by 'Franklin Wong'.
- 6) For each department whose average employee salary is more than \$30,000, retrieve the department name and the number of employees working for that department.
- 7) Retrieve the number of male employees in each department making more than \$30,000.
- 8) Retrieve the names of all employees who work in the department that has the employee with the highest salary among all employees.
- 9) Retrieve the names of all employees whose supervisor's supervisor has '888665555' for Ssn.
- 10) Retrieve the names of employees who make at least \$10,000 more than the employee who is paid the least in the company.
- 11) A view that has the department name, manager name, and manager salary for every department.
- 12) A view that has the employee name, supervisor name, and employee salary for each employee who works in the 'Research' department.

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- 13) A view that has the project name, controlling department name, number of employees, and total hours worked per week on the project for each project.
- 14) A view that has the project name, controlling department name, number of employees, and total hours worked per week on the project for each project with more than one employee working on it.

Submission

- Your work must be submitted on Blackboard on April 14, 2022
- You will need to submit your hw3sql.sql with all your queries and a Microsoft Word Document or PDF with the screenshots of the results of each query.
- You must do your own work.