CSCI 3901 Lab 7: SQL Queries

Fall 2021

Objective

In this lab, you will practice making SQL queries. You will need to build SQL queries in subsequent labs and assignments.

This lab will not be submitted or graded since it involves subqueries that we haven't done in class yet.

Preparation

- Make sure that you have the MySQLWorkbench working from lab 7.

Resources

- Database diagram at http://www.mysqltutorial.org/mysql-sample-database.aspx for the data in this lab.
- The csci3901 database available at db.cs.dal.ca
- Some answers from this lab may need you to use a subquery.

  Recall that the output of a "select" statement is a table of data. When we use the output of one "select" statement as the table for another, we call the first "select" statement to be a **subquery**.

  You represent a subquery by placing it inside round parentheses ( ) inside another query.

  For example, suppose I want a list of employees in office 1 as a subquery to a bigger query. The subquery is

  ```
  select employeeNumber from employees where officeCode = 1
  ```

  and the bigger query form (with unknown data between ….. designators) might be

  ```
  select customerName from customers where salesRepEmployeeNumber
      in …..query results from above ….
  ```

  The combined query is then:

  ```
  select customerName from customers where salesRepEmployeeNumber in
      ( select employeeNumber from employees where officeCode = 1 );
  ```

  Aside: in this query, we can get the same result without the subquery. The example is

only meant to show how to use the subquery syntax.

Since these subqueries can become long, another maintainable way of having subqueries is using a “with” statement:

```
with office1Employees as (select employeeNumber from employees where
    officeCode = 1)
    select customerName from customers where salesRepEmployeeNumber in
    office1Employees;
```

When you use the subquery as part of the “from “ clause, you also need to give the results of this subquery a name using the alias “as” syntax.

Procedure

Set-up

1. Open a query tab in MySQLWorkbench.

Lab steps

Part 1 – Starter queries

Write queries to answer the following questions:

1. Which orders were shipped after the date that the order was required?
2. What is the average time between an order being made and the order being shipped?
3. How many products are in each product line?
4. How many employees are in each office?
5. What is the most popular product, in terms of number of units sold?
6. What is the most popular product line, in terms of number of units sold?

Part 2 – Medium queries

Write queries to answer the following questions. You may need subqueries for some of these questions.

7. What is the largest order by total $ value? Smallest order?
8. What is the number of orders in each year?
9. What is the average order value in each year?
10. Which customers have placed the most orders? (top 5)
11. Which customers have the highest total order $ value? (top 5)
12. Which office had the most customers in 2004?

Part 3 – Queries needing a bit more thought

Write queries to answer the following questions:

13. Which customers owe us money?
14. What is the total order $ value generated by each employee in 2004?
15. Who is the Sales Manager for each office?
16. Which 2 products appear together in orders most often?

Broadening question

1. What strategy can you use to develop a query for a given question?
2. How do you make a query efficient?

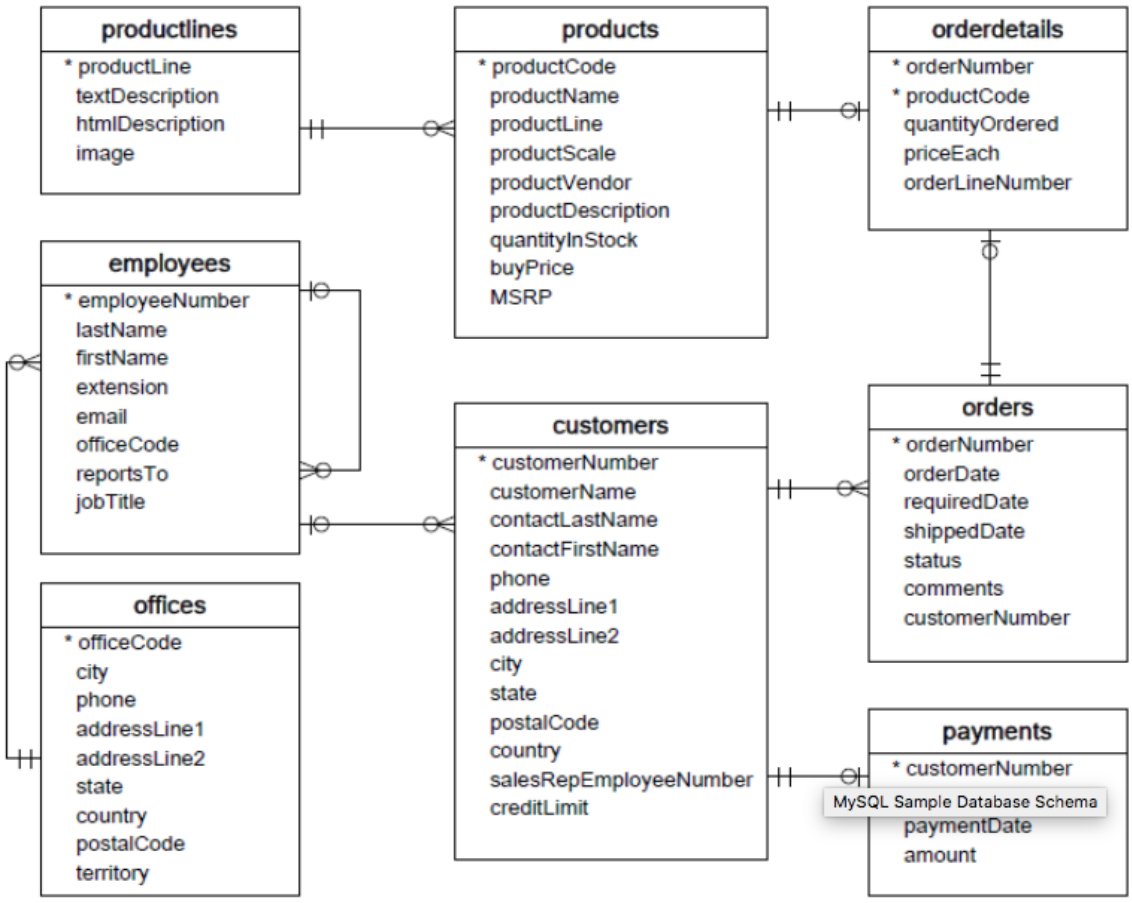

Figure 1 Database from http://www.mysqltutorial.org/mysql-sample-database.aspx