

LAB 7

Database Queries

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COMP-232: Programming Languages
California State University, Channel Islands

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Databases store data, lots and lots of data. They allow you to ask questions and get answers by writing and running queries. Queries are written in the Structured Query Language (SQL), which is a standardized language which works with any database.

The four basic SQL commands used by programmers are: **SELECT**, **INSERT**, **UPDATE**, and **DELETE**.

The first step is to install the client software called libsqlclient-dev onto your Windows laptop. We'll search for any Ubuntu updates and install them first. Then, we'll install libsqlclient-dev software by running:

```
% sudo apt-get update
```

```
% sudo apt-get upgrade
```

```
% sudo apt-get install mysql-client-core-8.0
```

```
% sudo apt-get install libsqlclient-dev
```

For Mac users, you can use:

```
% brew update
```

```
% brew upgrade
```

```
% brew install mysql-client
```

Let's record what you type using:

```
% script database.txt
```

```
Script started, file is database.txt
```

```
% ls
```

database.txt

Make sure you see “Script started” message and the database.txt file as you will need to upload the database.txt file to comp232.com to compete this assignment.

Log into MySQL database on comp232.com by using:

```
john@oho:~/LAB7$ mysql -u class -h comp232.com -p  
Enter password: CSUCIcomp232$  
Welcome to the MySQL monitor.  Commands end with ; or \g.  
Your MySQL connection id is 10926  
Server version: 8.0.30-0ubuntu0.20.04.2 (Ubuntu)
```

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Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

```
mysql> show databases;  
+-----+  
| Database |  
+-----+  
| classicmodels |  
| information_schema |  
| mysql |  
| performance_schema |  
| soar |  
| sys |  
+-----+  
6 rows in set (0.00 sec)
```



SOAR Database

mysql> use soar;

Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed

mysql> show tables;

```
+-----+
| Tables_in_soar |
+-----+
| voters_camarillo |
+-----+
1 row in set (0.00 sec)
```

mysql> desc voters_camarillo;

```
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| signed_flag    | char(1)       | NO   |     | n        |       |
| last_name      | varchar(25)   | NO   |     | NULL     |       |
| first_name     | varchar(25)   | YES  |     | NULL     |       |
| address        | varchar(40)   | YES  |     | NULL     |       |
| city           | varchar(25)   | YES  |     | NULL     |       |
| state          | varchar(2)    | YES  |     | NULL     |       |
| zipcode        | varchar(5)    | NO   |     | NULL     |       |
| house_number   | varchar(6)    | YES  |     | NULL     |       |
| unit_abbr      | varchar(6)    | YES  |     | NULL     |       |
| unit_number    | varchar(6)    | YES  |     | NULL     |       |
| street_name    | varchar(30)   | YES  |     | NULL     |       |
| street_suffix  | varchar(6)    | YES  |     | NULL     |       |
| predir        | varchar(6)    | YES  |     | NULL     |       |
| party          | varchar(20)   | YES  |     | NULL     |       |
| precinct_name  | varchar(20)   | YES  |     | NULL     |       |
+-----+-----+-----+-----+-----+-----+
15 rows in set (0.00 sec)
```

mysql> select count(*) from voters_camarillo;

```
+-----+
```

```

| count(*) |
+-----+
|    37568 |
+-----+
1 row in set (0.03 sec)

```

mysql> select distinct party from voters_camarillo;

```

+-----+
| party |
+-----+
| Dem   |
| Rep   |
| PnF   |
| Ind   |
| NPP   |
| Green |
| AmInd |
| NLaw  |
| Lib   |
| Ref   |
| LRU   |
| Other |
| Liberal
| Misc  |
| Con   |
| The Humane Party of
| CRP   |
| Citizens
| Mod   |
+-----+
19 rows in set (0.04 sec)

```

mysql> select count(*) from voters_camarillo where party = 'Dem';

```

+-----+
| count(*) |
+-----+
|    12158 |
+-----+
1 row in set (0.02 sec)

```

mysql> select count(*) from voters_camarillo where party = 'Rep';

mysql> select count(*) from voters_camarillo where party = 'Ind';

mysql> select count(*) from voters_camarillo where address like '%Rowland%';

```

+-----+
| count(*) |
+-----+
|      234 |
+-----+
1 row in set (0.04 sec)

```

mysql> select count(*) from voters_camarillo where address like '%Pierside%';

```

+-----+
| count(*) |
+-----+
|       32 |
+-----+
1 row in set (0.03 sec)

```

mysql> select * from voters_camarillo where address like '%Pierside%';

```

+-----+-----+-----+-----+-----+-----+-----+-----+
| signed_flag | last_name | first_name | address          | city      | state | zipcode |
house_number | unit_abbr | unit_number | street_name      | street_suffix | predir | party |
precinct_name |
+-----+-----+-----+-----+-----+-----+-----+-----+
| n           | Beck      | Cherie     | 1672 Pierside Ln | Camarillo | CA    | 93010   | 1672
|             |           | Pierside   | Ln               |           |      |         |
| n           | Carr      | Randall    | 1691 Pierside Ln | Camarillo | CA    | 93010   | 1691
|             |           | Pierside   | Ln               |           | Rep   |         |
| Y           | Collins   | Brian      | 1664 Pierside Ln | Camarillo | CA    | 93010   | 1664
|             |           | Pierside   | Ln               |           | NPP   |         |
| Y           | Collins   | Karey      | 1664 Pierside Ln | Camarillo | CA    | 93010   | 1664
|             |           | Pierside   | Ln               |           | NPP   |         |

```

And on and on ...

```

| n           | Valencia | Priscilla   | 1698 Pierside Ln | Camarillo | CA    | 93010   | 1698
|             |           | Pierside   | Ln               |           | Rep   |         |
| Y           | White    | Judith      | 1687 Pierside Ln | Camarillo | CA    | 93010   | 1687
|             |           | Pierside   | Ln               |           | NPP   |         |
+-----+-----+-----+-----+-----+-----+-----+-----+
32 rows in set (0.07 sec)

```

mysql> select * from voters_camarillo where address like '%Pierside%' and signed_flag = 'Y';

Displays 6 voters who live on Pierside Street and signed the SOAR petition.

```
mysql> select * from voters_camarillo where signed_flag = 'Y';
```

```
+-----+  
| count(*) |  
+-----+  
|      5109 |  
+-----+
```

```
1 row in set (0.04 sec)
```

```
mysql> select count(*) from voters_camarillo;
```

```
+-----+  
| count(*) |  
+-----+  
|    37568 |  
+-----+
```

```
1 row in set (0.03 sec)
```

classicmodels Database

MySQL Sample Database Diagram

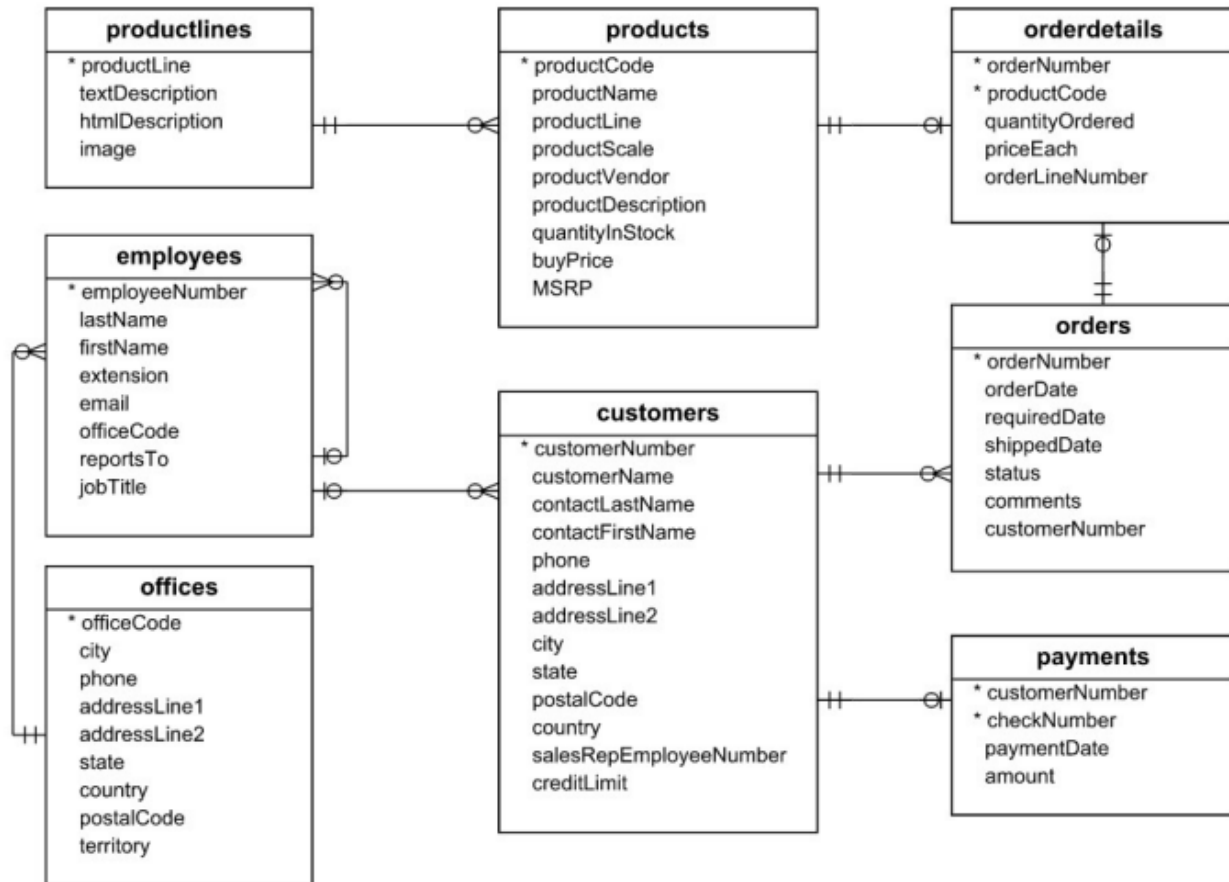


Figure 1. ER Diagram for classicmodels Database

```
mysql> show databases;
```

```
mysql> use classicmodels;
```

Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed

mysql> show tables;

```
+-----+
| Tables_in_classicmodels |
+-----+
| customers                |
| employees                |
| offices                 |
| orderdetails             |
| orders                   |
| payments                 |
| productlines             |
| products                 |
+-----+
8 rows in set (0.00 sec)
```

mysql> desc customers;

```
+-----+-----+-----+-----+-----+-----+
| Field                | Type                | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| customerNumber       | int                 | NO   | PRI | NULL    |       |
| customerName         | varchar(50)         | NO   |     | NULL    |       |
| contactLastName      | varchar(50)         | NO   |     | NULL    |       |
| contactFirstName     | varchar(50)         | NO   |     | NULL    |       |
| phone                | varchar(50)         | NO   |     | NULL    |       |
| addressLine1         | varchar(50)         | NO   |     | NULL    |       |
| addressLine2         | varchar(50)         | YES  |     | NULL    |       |
| city                 | varchar(50)         | NO   |     | NULL    |       |
| state                | varchar(50)         | YES  |     | NULL    |       |
| postalCode           | varchar(15)         | YES  |     | NULL    |       |
| country              | varchar(50)         | NO   |     | NULL    |       |
| salesRepEmployeeNumber | int                 | YES  | MUL | NULL    |       |
| creditLimit          | decimal(10,2)       | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
13 rows in set (0.00 sec)
```

mysql> desc employees;

```
+-----+-----+-----+-----+-----+-----+
| Field                | Type                | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| employeeNumber       | int                 | NO   | PRI | NULL    |       |
| lastName             | varchar(50)         | NO   |     | NULL    |       |
| firstName            | varchar(50)         | NO   |     | NULL    |       |
| extension            | varchar(10)         | NO   |     | NULL    |       |
| email                | varchar(100)        | NO   |     | NULL    |       |
| officeCode           | varchar(10)         | NO   | MUL | NULL    |       |
| reportsTo            | int                 | YES  | MUL | NULL    |       |
| jobTitle             | varchar(50)         | NO   |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
8 rows in set (0.00 sec)
```


mysql> select count(*) from employees;

```
+-----+
| count(*) |
+-----+
|      23 |
+-----+
1 row in set (0.03 sec)
```

mysql> select * from employees;

mysql> desc offices;

```
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| officeCode     | varchar(10)   | NO   | PRI | NULL     |       |
| city           | varchar(50)   | NO   |     | NULL     |       |
| phone          | varchar(50)   | NO   |     | NULL     |       |
| addressLine1   | varchar(50)   | NO   |     | NULL     |       |
| addressLine2   | varchar(50)   | YES  |     | NULL     |       |
| state          | varchar(50)   | YES  |     | NULL     |       |
| country        | varchar(50)   | NO   |     | NULL     |       |
| postalCode     | varchar(15)   | NO   |     | NULL     |       |
| territory      | varchar(10)   | NO   |     | NULL     |       |
+-----+-----+-----+-----+-----+-----+
9 rows in set (0.00 sec)
```

mysql> select city, state from offices;

This is an example of how you can select data from two tables by using a join.

**mysql> select employeeNumber, firstname, lastname, city, state
from employees e, offices o
where e.officeCode = o.officeCode and
city = 'San Francisco';**

```
+-----+-----+-----+-----+-----+
| employeeNumber | firstname | lastname | city          | state |
+-----+-----+-----+-----+-----+
|      1002      | Diane    | Murphy   | San Francisco | CA    |
|      1056      | Mary     | Patterson | San Francisco | CA    |
|      1076      | Jeff     | Firrelli | San Francisco | CA    |
|      1143      | Anthony  | Bow       | San Francisco | CA    |
|      1165      | Leslie   | Jennings | San Francisco | CA    |
|      1166      | Leslie   | Thompson  | San Francisco | CA    |
+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

mysql> show tables;

```
+-----+
| Tables_in_classicmodels |
+-----+
| customers                |
| employees                |
| offices                  |
| orderdetails             |
| orders                   |
| payments                 |
| productlines             |
| products                 |
+-----+
8 rows in set (0.00 sec)
```

mysql> desc products;

```
+-----+-----+-----+-----+-----+-----+
| Field          | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| productCode    | varchar(15)   | NO   | PRI | NULL    |       |
| productName    | varchar(70)   | NO   |     | NULL    |       |
| productLine    | varchar(50)   | NO   | MUL | NULL    |       |
| productScale   | varchar(10)   | NO   |     | NULL    |       |
| productVendor  | varchar(50)   | NO   |     | NULL    |       |
| productDescription | text         | NO   |     | NULL    |       |
| quantityInStock | smallint      | NO   |     | NULL    |       |
| buyPrice       | decimal(10,2) | NO   |     | NULL    |       |
| MSRP           | decimal(10,2) | NO   |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
9 rows in set (0.00 sec)
```

mysql> quit

Bye

% exit

Script done, file is database.txt

To receive credit, upload database.txt to your LAB7 directory.