DAD 220
Prof. Aastha Agarwal
Alexander Ahmann
18 March, 2022

Question 1

Before you begin, type the following commands prior to typing MySQL to set file permissions. This will allow you to perform the file output creation:

- `chmod +x change_perm.sh` and then
- `./change_perm.sh`
- Then, enter a command line session with MySQL and reconnect to the employee information you entered in the previous lab.
- Write a `SELECT` statement for the `Employee` table to check that you have reconnected to the right information.

Answer: See "My answer to question 1" figure.

Question 2

Update the name of the `Branches` table that you created in the previous lab to say "Department."

Answer: See "My answer to question 2" figure.

Question 3

Insert fields to the `Department` table with the following query, so that you will be able to perform joins on them. Then write a `SELECT` statement to demonstrate that this step was executed.

```
codio@mangogorilla-ohiochef:~/workspace$ ls
change_perm.sh  FleetMaintenanceRecords.csv  orders.csv   README.md  sqlite   tkinterpy
customers.csv   mysqlsampledatabase.sql      __pycache__  rma.csv    staruml
codio@mangogorilla-ohiochef:~/workspace$ chmod +x change_perm.sh
codio@mangogorilla-ohiochef:~/workspace$ ./change_perm.sh

 Updated ownership of workspace to mysql

codio@mangogorilla-ohiochef:~/workspace$ mysql
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 37
Server version: 5.5.62-0ubuntu0.14.04.1 (Ubuntu)

Copyright (c) 2000, 2018, Oracle and/or its affiliates. All rights reserved.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

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

mysql> SELECT * FROM Employee;
ERROR 1046 (3D000): No database selected
mysql> use ahmann;
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> SELECT * FROM Employee;
+-------------+------------+------------+---------------+----------------+-----------+----------+
| Employee_ID | First_Name | Last_Name  | Department_ID | Classification | STATUS    | Salary   |
+-------------+------------+------------+---------------+----------------+-----------+----------+
|         100 | John       | Smith      |             1 | Exempt         | Full-Time | 90000.00 |
|         101 | Mary       | Jones      |             2 | Non-Exempt     | Part-Time | 35000.00 |
|         102 | Mary       | Williams   |             3 | Exempt         | Full-Time | 80000.00 |
|         103 | Gwen       | Johnson    |             4 | NULL           | Full-Time | 40000.00 |
|         104 | Michael    | Jones      |             4 | Non-Exempt     | Full-Time | 90000.00 |
|         105 | Alexander  | Ahmann     |             1 | Non-Exempt     | Full-Time | 51342.00 |
|         106 | Rocking    | Philosophy |             4 | Exempt         | Full-Time |   777.00 |
+-------------+------------+------------+---------------+----------------+-----------+----------+
7 rows in set (0.00 sec)
```

Figure 1: **My answer to question 1**

```
INSERT INTO Department VALUES
    (1, "Accounting"),
    (2, "Human Resources"),
    (3, "Information Systems"),
    (4, "Marketing");
```

Answer: See “My answer to question 3” figure.

```
mysql> ALTER TABLE Branches RENAME Department;
Query OK, 0 rows affected (0.02 sec)

mysql> SELECT * FROM Department;
Empty set (0.00 sec)
```

Figure 2: **My answer to question 2**

```
mysql> INSERT INTO Department VALUES
    ->     (1, "Accounting"),
    ->     (2, "Human Resources"),
    ->     (3, "Information Systems"),
    ->     (4, "Marketing");
Query OK, 4 rows affected (0.01 sec)
Records: 4  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM Department;
+---------------+--------------------+
| Department_ID | Department_Name    |
+---------------+--------------------+
|             1 | Accounting         |
|             2 | Human Resources    |
|             3 | Information Systems |
|             4 | Marketing          |
+---------------+--------------------+
4 rows in set (0.00 sec)
```

Figure 3: **My answer to question 3**

Question 4

Now, perform joins between the `Department` and `Employee` tables and show results for how many employees work in each one of the four departments. This will only provide information on the records that are already there.

Answer: See "My answer to question 4" figure.

```
mysql> SELECT First_Name, Last_Name, Department.Department_Name FROM Employee INNER JOIN Department ON Employee.De
partment_ID = Department.Department_ID WHERE Employee.Department_ID = 1;
+------------+-----------+-----------------+
| First_Name | Last_Name | Department_Name |
+------------+-----------+-----------------+
| John       | Smith     | Accounting      |
| Alexander  | Ahmann    | Accounting      |
+------------+-----------+-----------------+
2 rows in set (0.00 sec)

mysql> SELECT First_Name, Last_Name, Department.Department_Name FROM Employee INNER JOIN Department ON Employee.De
partment_ID = Department.Department_ID WHERE Employee.Department_ID = 2;
+------------+-----------+-----------------+
| First_Name | Last_Name | Department_Name |
+------------+-----------+-----------------+
| Mary       | Jones     | Human Resources |
+------------+-----------+-----------------+
1 row in set (0.00 sec)

mysql> SELECT First_Name, Last_Name, Department.Department_Name FROM Employee INNER JOIN Department ON Employee.De
partment_ID = Department.Department_ID WHERE Employee.Department_ID = 3;
+------------+-----------+--------------------+
| First_Name | Last_Name | Department_Name    |
+------------+-----------+--------------------+
| Mary       | Williams  | Information Systems |
+------------+-----------+--------------------+
1 row in set (0.00 sec)

mysql> SELECT First_Name, Last_Name, Department.Department_Name FROM Employee INNER JOIN Department ON Employee.De
partment_ID = Department.Department_ID WHERE Employee.Department_ID = 4;
+------------+------------+-----------------+
| First_Name | Last_Name  | Department_Name |
+------------+------------+-----------------+
| Gwen       | Johnson    | Marketing       |
| Michael    | Jones      | Marketing       |
| Rocking    | Philosophy | Marketing       |
+------------+------------+-----------------+
3 rows in set (0.00 sec)
```

Figure 4: **My answer to question 4**

Question 5

Populate the `Employee` table with information for ten new employees. Give them unique names and include attributes for all necessary fields. (Note: Please reference attributes from the lab in Module Two. Department ID values must be between 1 and 4.)

Answer: See "My answer to question 5" figure.

```
mysql> INSERT INTO Employee (Employee_ID, First_Name, Last_Name, Department_ID, Classification, STATUS,
 Salary) VALUES
    ->     (107, "Aaron", "Clarey", 1, NULL, "Part-Time", 100001),
    ->     (108, "Dave", "Northal", 2, "Non-Exempt", "Full-Time", 666),
    ->     (109, "James", "Allsup", 3, "Exempt", "Part-Time", 20000),
    ->     (110, "Rob", "U-Blind", 4, "Non-Exempt", "Full-Time", 40000),
    ->     (111, "Stefan", "Molyneux", 3, NULL, "Part-Time", 71342),
    ->     (112, "Larry", "Bird", 1, "Exempt", "Part-Time", 66333),
    ->     (113, "Collin", "Kappernick", 4, "Exempt", "Full-Time", 71285),
    ->     (114, "Nonea", "Dambisnezz", 2, "Exempt", "Full-Time", 42131),
    ->     (115, "Nicole", "Monk", 3, "Non-Exempt", "Part-Time", 99999),
    ->     (116, "Tori", "Vegas", 4, "Non-Exempt", "Part-Time", 66666);
Query OK, 10 rows affected, 1 warning (0.04 sec)
Records: 10  Duplicates: 0  Warnings: 1

mysql> SELECT * FROM Employee;
+-------------+------------+------------+---------------+----------------+-----------+----------+
| Employee_ID | First_Name | Last_Name  | Department_ID | Classification | STATUS    | Salary   |
+-------------+------------+------------+---------------+----------------+-----------+----------+
|         100 | John       | Smith      |             1 | Exempt         | Full-Time | 90000.00 |
|         101 | Mary       | Jones      |             2 | Non-Exempt     | Part-Time | 35000.00 |
|         102 | Mary       | Williams   |             3 | Exempt         | Full-Time | 80000.00 |
|         103 | Gwen       | Johnson    |             4 | NULL           | Full-Time | 40000.00 |
|         104 | Michael    | Jones      |             4 | Non-Exempt     | Full-Time | 90000.00 |
|         105 | Alexander  | Ahmann     |             1 | Non-Exempt     | Full-Time | 51342.00 |
|         106 | Rocking    | Philosophy |             4 | Exempt         | Full-Time |   777.00 |
|         107 | Aaron      | Clarey     |             1 | NULL           | Part-Time | 99999.99 |
|         108 | Dave       | Northal    |             2 | Non-Exempt     | Full-Time |   666.00 |
|         109 | James      | Allsup     |             3 | Exempt         | Part-Time | 20000.00 |
|         110 | Rob        | U-Blind    |             4 | Non-Exempt     | Full-Time | 40000.00 |
|         111 | Stefan     | Molyneux   |             3 | NULL           | Part-Time | 71342.00 |
|         112 | Larry      | Bird       |             1 | Exempt         | Part-Time | 66333.00 |
|         113 | Collin     | Kappernick |             4 | Exempt         | Full-Time | 71285.00 |
|         114 | Nonea      | Dambisnezz |             2 | Exempt         | Full-Time | 42131.00 |
|         115 | Nicole     | Monk       |             3 | Non-Exempt     | Part-Time | 99999.00 |
|         116 | Tori       | Vegas      |             4 | Non-Exempt     | Part-Time | 66666.00 |
+-------------+------------+------------+---------------+----------------+-----------+----------+
17 rows in set (0.00 sec)
```

Figure 5: **My answer to question 5**

Question 6

Perform a join across the `Employee` and `Department` Tables for each of the four departments. New and existing records should be displayed in the results.

Answer: See "My answer to question 6" figure.

Question 7

Identify the resultant outputs of the commands that you have written.

Answer: Regarding the last question, I count:

- Four (4) rows, or employees, in the Accounting department (Dept. ID #1)
- Three (3) rows, or employees, in the Human Resources department (Dept. ID #2)
- Four (4) rows, or employees, in the Information Systems department (Dept. ID #3)
- Six (6) rows, or employees, in the Marketing department (Dept. ID #4)

Question 8

Create a CSV file that contains only the records of employees in Human Resources and Information Systems.

Answer: See "My answer to question 8" figure.

```
mysql> SELECT First_Name, Last_name, Employee_ID, Department.Department_ID FROM Employee INNER JOIN
Department ON Employee.Department_ID = Department.Department_ID WHERE Employee.Department_ID = 1;
+------------+-----------+-------------+---------------+
| First_Name | Last_name | Employee_ID | Department_ID |
+------------+-----------+-------------+---------------+
| John       | Smith     |         100 |             1 |
| Alexander  | Ahmann    |         105 |             1 |
| Aaron      | Clarey    |         107 |             1 |
| Larry      | Bird      |         112 |             1 |
+------------+-----------+-------------+---------------+
4 rows in set (0.00 sec)

mysql> SELECT First_Name, Last_name, Employee_ID, Department.Department_ID FROM Employee INNER JOIN
Department ON Employee.Department_ID = Department.Department_ID WHERE Employee.Department_ID = 2;
+------------+------------+-------------+---------------+
| First_Name | Last_name  | Employee_ID | Department_ID |
+------------+------------+-------------+---------------+
| Mary       | Jones      |         101 |             2 |
| Dave       | Northal    |         108 |             2 |
| Nonea      | Dambisnezz |         114 |             2 |
+------------+------------+-------------+---------------+
3 rows in set (0.00 sec)

mysql> SELECT First_Name, Last_name, Employee_ID, Department.Department_ID FROM Employee INNER JOIN
Department ON Employee.Department_ID = Department.Department_ID WHERE Employee.Department_ID = 3;
+------------+-----------+-------------+---------------+
| First_Name | Last_name | Employee_ID | Department_ID |
+------------+-----------+-------------+---------------+
| Mary       | Williams  |         102 |             3 |
| James      | Allsup    |         109 |             3 |
| Stefan     | Molyneux  |         111 |             3 |
| Nicole     | Monk      |         115 |             3 |
+------------+-----------+-------------+---------------+
4 rows in set (0.00 sec)

mysql> SELECT First_Name, Last_name, Employee_ID, Department.Department_ID FROM Employee INNER JOIN
Department ON Employee.Department_ID = Department.Department_ID WHERE Employee.Department_ID = 4;
+------------+------------+-------------+---------------+
| First_Name | Last_name  | Employee_ID | Department_ID |
+------------+------------+-------------+---------------+
| Gwen       | Johnson    |         103 |             4 |
| Michael    | Jones      |         104 |             4 |
| Rocking    | Philosophy |         106 |             4 |
| Rob        | U-Blind    |         110 |             4 |
| Collin     | Kappernick |         113 |             4 |
| Tori       | Vegas      |         116 |             4 |
+------------+------------+-------------+---------------+
6 rows in set (0.00 sec)
```

Figure 6: **My answer to question 6**

Question 9

Reflections: Provide detailed insight on the prompts below by explaining your process along with how and why it ultimately worked.

```
mysql> SELECT First_Name, Last_Name, Department.Department_Name FROM Employee INNER JOIN
 Department ON Employee.Department_ID = Department.Department_ID WHERE Employee.Departme
nt_ID = 3 OR Employee.Department_ID = 2 INTO OUTFILE "/home/codio/workspace/HRandIS-Empl
oyees-Fixed.csv" FIELDS TERMINATED BY ",";
Query OK, 7 rows affected (0.00 sec)

mysql> exit
Bye
codio@mangogorilla-ohiochef:~/workspace$ cat ~/workspace/HRandIS-Employees.Fixed.csv
cat: /home/codio/workspace/HRandIS-Employees.Fixed.csv: No such file or directory
codio@mangogorilla-ohiochef:~/workspace$ cat ~/workspace/HRandIS-Employees-Fixed.csv
Mary,Jones,Human Resources
Mary,Williams,Information Systems
Dave,Northal,Human Resources
James,Allsup,Information Systems
Stefan,Molyneux,Information Systems
Nonea,Dambisnezz,Human Resources
Nicole,Monk,Information Systems
```

Figure 7: **My answer to question 8**

Regarding process:

- Explain how the joins you used in this assignment worked.

  Answer: I shall "break down" the following sample query: `select First_Name, Last_Name, Department.Department_Name from Employee inner join Department on Employee.Department_ID = Department.Department_ID where Employee.Department_ID = 1;`

  Note that I like to capitalise SQL keywords. Starting with:

  ```
  SELECT First_Name, Last_Name, Department.Department_Name
  FROM Employee [...]
  ```

  This is the part of the command to instruct MySQL database to get specifically the `First_Name`, `Last_Name` and `Departname_Name` columns from the (inner joined) `Employee` and Department tables. The `Department.` prefix on `Department_Name` is to avoid ambiguity when selecting the column from the table.

```
INNER JOIN Department ON
Employee.Department_ID = Department.Department_ID
```

This is the part of the query that instructs MySQL to do an inner join with the `Employee` and `Department` tables. An inner join, in this case, will get rows where the `Employee.Department_ID` is equal to the `Department.Department_ID`.

Finally, the ...

```
WHERE Employee.Department_ID = 1;
```

... is the bit that will instruct MySQL to get rows from a specific department given the department ID from the `Employee` table.

- Describe why the commands you used were able to retrieve the `Department` table when you selected the `Department` name.

  Answer: ???

Regarding file creation and extraction:

- When you write the records of your query to a CSV file, how many records are in the file?

  Answer: I counted a total of seven (7) entries in the CSV outfile.

- Provide a detailed explanation of how the process of extracting data to a flat file works.

  Answer: I will examine the query and "break it down:" `select First_Name, Last_Name, Department.Department_Name from Employee inner join Department on Employee.Department_ID = Department.Department_ID where Employee.Department_ID = 3 OR Employee.Department_ID = 2 into outfile "/home/codio/workspace/HRandIS-Employees.csv" FIELDS TERMINATED BY ",";`

  The first part ...

```
SELECT First_Name, Last_Name, Department.Department_Name
FROM Employee
INNER JOIN Department
```

```
ON Employee.Department_ID = Department.Department_ID
WHERE Employee.Department_ID = 3
OR Employee.Department_ID = 2
```

... is something that I covered earlier, so I won't bother going over it again. The only new bit is the `OR Employee.Department_ID = 2` which extends the rows returned by adding another department ID.

The bit ...

```
INTO OUTFILE "/home/codio/workspace/HRandIS-Employees.csv"
FIELDS TERMINATED BY ",";
```

... instructs the MySQL database to "pipe out" the results from the `SELECT` inner join query into a CSV file under the workspace folder, where specifically `FIELDS TERMINATED BY ","` gives more information to MySQL, telling it to separate the column entries with a comma (since it's a comma-separated values (CSV) file).