Launching into Computer Science Assignment 1: Part 3

Question 1: List all Employees whose salary is between 1,000 AND 2,000.

Show the Employee Name, Department and Salary.

Codio screenshot of Qu_1.sql:

```
1  USE COMPANY1;
2
3  SELECT
4  EMP.ENAME AS Employee_Name, /*Select three columns required in the question*/
5  DEPT.DNAME AS Department,
6  EMP.SAL AS Salary /*Aliased column names to make results easier to read*/
7  FROM EMP
8  INNER JOIN DEPT /*Inner join to hide DEPTNO column in results*/
9  ON EMP.DEPTNO = DEPT.DEPTNO /*match dept numbers to see relevant dept name. in results*/
10 WHERE EMP.SAL BETWEEN 1000 AND 2000; /*restriction on employee salary as required*/
11
```

Terminal screenshot of results:

```
MariaDB [COMPANY1]> source Qu_1.sql;
Database changed
+---------------+------------+---------+
| Employee_Name | Department | Salary  |
+---------------+------------+---------+
| ALLEN         | SALES      | 1600.00 |
| WARD          | SALES      | 1250.00 |
| MARTIN        | SALES      | 1250.00 |
| TURNER        | SALES      | 1500.00 |
| ADAMS         | RESEARCH   | 1100.00 |
| MILLER        | ACCOUNTING | 1300.00 |
+---------------+------------+---------+
6 rows in set (0.000 sec)
```

One thing to note is that the results could be ordered by any column as required using ORDER BY column_name ASC|DESC. This also applies to the other questions in this assignment.

Question 2: Count the number of people in department 30 who receive a salary and the number of people who receive a commission.

Codio screenshot of Qu_2.sql:

```sql
USE COMPANY1;

SELECT
EMP.DEPTNO AS Department_Number, /*Department number column to be restricted later*/
COUNT(EMP.SAL) AS Total_Salaries, /*Count number of employees receiving salaries*/
COUNT(EMP.COMM) AS Total_Commissions /*Count number of employees receiving commissions*/
FROM EMP
WHERE EMP.DEPTNO = 30; /*restriction on department number as required*/

```

Terminal Screenshot of results:

```
MariaDB [COMPANY1]> source Qu_2.sql;
Database changed
+-----------------+----------------+-------------------+
| Department_Number | Total_Salaries | Total_Commissions |
+-----------------+----------------+-------------------+
|               30 |              6 |                 4 |
+-----------------+----------------+-------------------+
1 row in set (0.001 sec)
```

Question 3: Find the name and salary of employees in Dallas.

Codio screenshot of Qu_3.sql:

```sql
USE COMPANY1;

SELECT
EMP.ENAME AS Dallas_Employee_Name, /*Aliased column names to make results easier to read*/
EMP.SAL AS Salary
FROM EMP
INNER JOIN DEPT /*Inner join to hide department numbers in results*/
ON EMP.DEPTNO = DEPT.DEPTNO /*Match employee dept no. with location from DEPT table*/
WHERE DEPT.LOC = "DALLAS"; /*Restricts department location as required*/

/*Alternate solution*/

SELECT
EMP.ENAME AS EMPLOYEE_IN_DALLAS,
EMP.SAL AS SALARY
FROM EMP
WHERE EMP.DEPTNO = 20;

```

Terminal screenshot of result:

```
MariaDB [COMPANY1]> source Qu_3.sql;
Database changed
+----------------------+---------+
| Dallas_Employee_Name | Salary  |
+----------------------+---------+
| SMITH                |  800.00 |
| JONES                | 2975.00 |
| SCOTT                | 3000.00 |
| ADAMS                | 1100.00 |
| FORD                 | 3000.00 |
+----------------------+---------+
5 rows in set (0.024 sec)

+--------------------+---------+
| EMPLOYEE_IN_DALLAS | SALARY  |
+--------------------+---------+
| SMITH              |  800.00 |
| JONES              | 2975.00 |
| SCOTT              | 3000.00 |
| ADAMS              | 1100.00 |
| FORD               | 3000.00 |
+--------------------+---------+
5 rows in set (0.000 sec)
```

The alternate solution above produces the same result but without a JOIN. This solution is simpler but would not give the correct result if the location number of Dallas was to

change for any reason. Using a JOIN and restricting the DEPT.LOC to Dallas instead will give the correct result even if the department number where to change, or if any additional departments where moved to Dallas.

Question 4: List all departments that do not have any employees.

Codio screenshot of Qu_4.sql:

```sql
USE COMPANY1;

SELECT
DEPT.DNAME AS Departments_With_No_Employees /*Department names column with alias*/
FROM DEPT
WHERE DEPT.DEPTNO
NOT IN (
  SELECT
  EMP.DEPTNO
  FROM EMP
);
/*NOT IN statement acting on the employee's department number column.
If a number appears in DEPT.DEPTNO but not in EMP.DEPTNO it's associated department
name will appear in the results*/

```

Terminal screenshot of results:

```
MariaDB [COMPANY1]> source Qu_4.sql;
Database changed
+------------------------------+
| Departments_With_No_Employees |
+------------------------------+
| OPERATIONS                   |
+------------------------------+
```

The NOT IN statement above follows the idea that we want to find $A \cap B'$, where A is DEPT.DEPTNO and B is EMP.DEPTNO, and B' is the compliment of B.

Question 5: List the department number and average salary of each department.

Codio screenshots of Qu_5.sql:

```sql
USE COMPANY1;

SELECT
DEPT.DEPTNO AS Department_Number,
AVG(EMP.SAL) AS Average_Salary /*Takes the mean of the employees salaries*/
FROM DEPT /*From department table so that all department numbers are included*/
LEFT JOIN EMP
ON DEPT.DEPTNO = EMP.DEPTNO
GROUP BY EMP.DEPTNO /*Group by employee dept no. for means*/
ORDER BY DEPT.DEPTNO; /* sort by dept. number*/

```

Terminal screenshot of results:

```
MariaDB [COMPANY1]> source Qu_5.sql;
Database changed
+-----------------+----------------+
| Department_Number | Average_Salary |
+-----------------+----------------+
|               10 |    2916.666667 |
|               20 |    2175.000000 |
|               30 |    1566.666667 |
|               40 |           NULL |
+-----------------+----------------+
4 rows in set (0.000 sec)
```

Final File:

Codio and terminal screenshots of SQL_Lab.sql with specified mysql in line 1:

```
mysql;
USE COMPANY1;

/* Qu_1
List all Employees whose salary is between 1,000 AND 2,000.
Show the Employee Name, Department and Salary. */

SELECT
EMP.ENAME AS Employee_Name,
DEPT.DNAME AS Department,
EMP.SAL AS Salary
FROM EMP
INNER JOIN DEPT
ON EMP.DEPTNO = DEPT.DEPTNO
WHERE EMP.SAL BETWEEN 1000 AND 2000;

/* Qu_2
Count the number of people in department 30 who receive a salary
and the number of people who receive a commission. */

SELECT
EMP.DEPTNO AS Department_Number,
COUNT(EMP.SAL) AS Total_Salaries,
COUNT(EMP.COMM) AS Total_Commissions
FROM EMP
WHERE EMP.DEPTNO = 30;

/* Qu_3
Find the name and salary of employees in Dallas. */

SELECT
EMP.ENAME AS Dallas_Employee_Name,
EMP.SAL AS Salary
FROM EMP
INNER JOIN DEPT
ON EMP.DEPTNO = DEPT.DEPTNO
WHERE DEPT.LOC = "DALLAS";

/* Qu_4
List all departments that do not have any employees. */

SELECT
DEPT.DNAME AS Departments_With_No_Employees
FROM DEPT
WHERE DEPT.DEPTNO
NOT IN (
  SELECT
  EMP.DEPTNO
  FROM EMP
);

/* Qu_5
List the department number and average salary of each department. */

SELECT
DEPT.DEPTNO AS Department_Number,
AVG(EMP.SAL) AS Average_Salary
FROM DEPT
LEFT JOIN EMP
ON DEPT.DEPTNO = EMP.DEPTNO
GROUP BY EMP.DEPTNO
ORDER BY DEPT.DEPTNO;

```

```
MariaDB [(none)]> source SQL_Lab.sql;
ERROR 1064 (42000) at line 1 in file: 'SQL_Lab.sql': You have an error in your SQL syntax; check the manual
 that corresponds to your MariaDB server version for the right syntax to use near 'mysql' at line 1
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
+---------------+------------+---------+
| Employee_Name | Department | Salary  |
+---------------+------------+---------+
| ALLEN         | SALES      | 1600.00 |
| WARD          | SALES      | 1250.00 |
| MARTIN        | SALES      | 1250.00 |
| TURNER        | SALES      | 1500.00 |
| ADAMS         | RESEARCH   | 1100.00 |
| MILLER        | ACCOUNTING | 1300.00 |
+---------------+------------+---------+
6 rows in set (0.000 sec)

+-------------------+----------------+-------------------+
| Department_Number | Total_Salaries | Total_Commissions |
+-------------------+----------------+-------------------+
|                30 |              6 |                 4 |
+-------------------+----------------+-------------------+
1 row in set (0.000 sec)

+----------------------+---------+
| Dallas_Employee_Name | Salary  |
+----------------------+---------+
| SMITH                |  800.00 |
| JONES                | 2975.00 |
| SCOTT                | 3000.00 |
| ADAMS                | 1100.00 |
| FORD                 | 3000.00 |
+----------------------+---------+
5 rows in set (0.000 sec)

+-------------------------------+
| Departments_With_No_Employees |
+-------------------------------+
| OPERATIONS                    |
+-------------------------------+
1 row in set (0.000 sec)

+-------------------+----------------+
| Department_Number | Average_Salary |
+-------------------+----------------+
|                10 |    2916.666667 |
|                20 |    2175.000000 |
|                30 |    1566.666667 |
|                40 |           NULL |
+-------------------+----------------+
4 rows in set (0.000 sec)
```

Codio and terminal screenshots of SQL_Lab.sql with specified mysql in line 1 commented out to avoid error:

```sql
/*mysql;*/
USE COMPANY1;

/* Qu_1
List all Employees whose salary is between 1,000 AND 2,000.
Show the Employee Name, Department and Salary. */

SELECT
EMP.ENAME AS Employee_Name,
DEPT.DNAME AS Department,
EMP.SAL AS Salary
FROM EMP
INNER JOIN DEPT
ON EMP.DEPTNO = DEPT.DEPTNO
WHERE EMP.SAL BETWEEN 1000 AND 2000;

/* Qu_2
Count the number of people in department 30 who receive a salary
and the number of people who receive a commission. */

SELECT
EMP.DEPTNO AS Department_Number,
COUNT(EMP.SAL) AS Total_Salaries,
COUNT(EMP.COMM) AS Total_Commissions
FROM EMP
WHERE EMP.DEPTNO = 30;

/* Qu_3
Find the name and salary of employees in Dallas. */

SELECT
EMP.ENAME AS Dallas_Employee_Name,
EMP.SAL AS Salary
FROM EMP
INNER JOIN DEPT
ON EMP.DEPTNO = DEPT.DEPTNO
WHERE DEPT.LOC = "DALLAS";

/* Qu_4
List all departments that do not have any employees. */

SELECT
DEPT.DNAME AS Departments_With_No_Employees
FROM DEPT
WHERE DEPT.DEPTNO
NOT IN (
  SELECT
  EMP.DEPTNO
  FROM EMP
);

/* Qu_5
List the department number and average salary of each department. */

SELECT
DEPT.DEPTNO AS Department_Number,
AVG(EMP.SAL) AS Average_Salary
FROM DEPT
LEFT JOIN EMP
ON DEPT.DEPTNO = EMP.DEPTNO
GROUP BY EMP.DEPTNO
ORDER BY DEPT.DEPTNO;
```

```
MariaDB [COMPANY1]> source SQL_Lab.sql;
Database changed
+---------------+------------+---------+
| Employee_Name | Department | Salary  |
+---------------+------------+---------+
| ALLEN         | SALES      | 1600.00 |
| WARD          | SALES      | 1250.00 |
| MARTIN        | SALES      | 1250.00 |
| TURNER        | SALES      | 1500.00 |
| ADAMS         | RESEARCH   | 1100.00 |
| MILLER        | ACCOUNTING | 1300.00 |
+---------------+------------+---------+
6 rows in set (0.000 sec)

+-------------------+----------------+-------------------+
| Department_Number | Total_Salaries | Total_Commissions |
+-------------------+----------------+-------------------+
|                30 |              6 |                 4 |
+-------------------+----------------+-------------------+
1 row in set (0.000 sec)

+----------------------+---------+
| Dallas_Employee_Name | Salary  |
+----------------------+---------+
| SMITH                |  800.00 |
| JONES                | 2975.00 |
| SCOTT                | 3000.00 |
| ADAMS                | 1100.00 |
| FORD                 | 3000.00 |
+----------------------+---------+
5 rows in set (0.000 sec)

+------------------------------+
| Departments_With_No_Employees |
+------------------------------+
| OPERATIONS                   |
+------------------------------+
1 row in set (0.000 sec)

+-------------------+----------------+
| Department_Number | Average_Salary |
+-------------------+----------------+
|                10 |    2916.666667 |
|                20 |    2175.000000 |
|                30 |    1566.666667 |
|                40 |           NULL |
+-------------------+----------------+
4 rows in set (0.000 sec)
```