Inspiring Excellence

CSE 370: Database Systems
Lab Homework 3
Section: 07

Submitted by:

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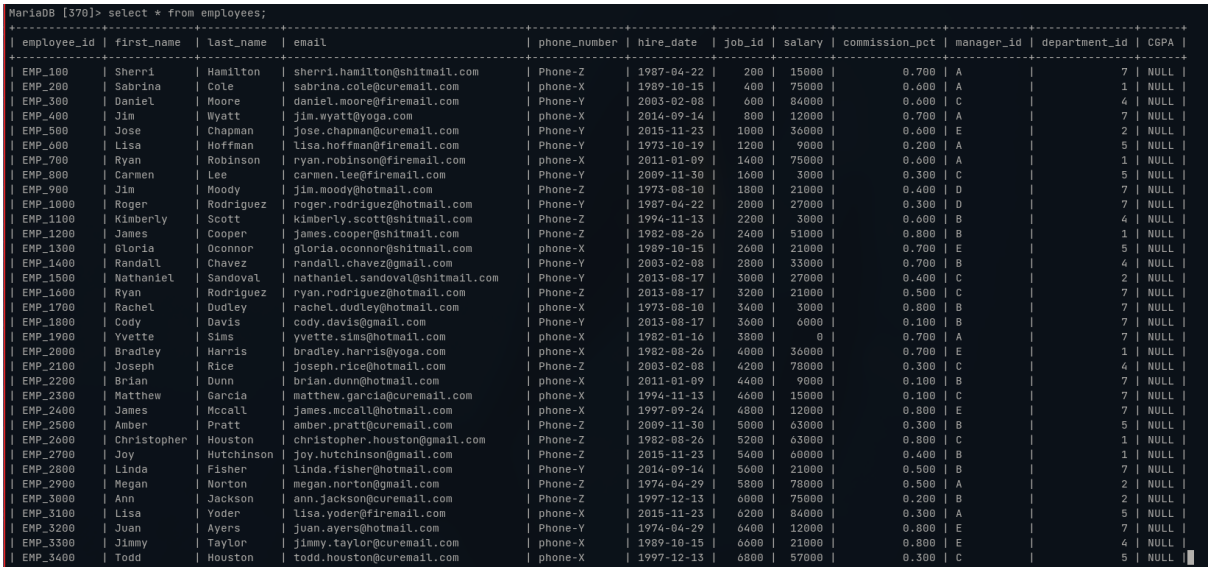
Database State(dummy data created with Faker)



```
MariaDB [370]> select * from employees;
+-------------+------------+-----------+---------------------------------+--------------+------------+--------+--------+----------------+------------+---------------+-------+
| employee_id | first_name | last_name | email                           | phone_number | hire_date  | job_id | salary | commission_pct | manager_id | department_id | CGPA  |
+-------------+------------+-----------+---------------------------------+--------------+------------+--------+--------+----------------+------------+---------------+-------+
| EMP_100     | Sherri     | Hamilton  | sherri.hamilton@shitmail.com    | Phone-Z      | 1987-04-22 |    200 |  15000 |          0.700 | A          |             7 | NULL  |
| EMP_200     | Sabrina    | Cole      | sabrina.cole@curemail.com       | phone-X      | 1989-10-15 |    400 |  75000 |          0.600 | A          |             1 | NULL  |
| EMP_300     | Daniel     | Moore     | daniel.moore@firemail.com       | Phone-Y      | 2003-02-08 |    600 |  84000 |          0.600 | C          |             4 | NULL  |
| EMP_400     | Jim        | Wyatt     | jim.wyatt@yoga.com              | phone-X      | 2014-09-14 |    800 |  12000 |          0.700 | A          |             7 | NULL  |
| EMP_500     | Jose       | Chapman   | jose.chapman@curemail.com       | Phone-Y      | 2015-11-23 |   1000 |  36000 |          0.600 | E          |             2 | NULL  |
| EMP_600     | Lisa       | Hoffman   | lisa.hoffman@firemail.com       | Phone-Y      | 1973-10-19 |   1200 |   9000 |          0.200 | A          |             5 | NULL  |
| EMP_700     | Ryan       | Robinson  | ryan.robinson@firemail.com      | phone-X      | 2011-01-09 |   1400 |  75000 |          0.600 | A          |             1 | NULL  |
| EMP_800     | Carmen     | Lee       | carmen.lee@firemail.com         | Phone-Y      | 2009-11-30 |   1600 |   3000 |          0.300 | C          |             5 | NULL  |
| EMP_900     | Jim        | Moody     | jim.moody@hotmail.com           | Phone-Z      | 1973-08-10 |   1800 |  21000 |          0.400 | D          |             7 | NULL  |
| EMP_1000    | Roger      | Rodriguez | roger.rodriguez@hotmail.com     | Phone-Y      | 1987-04-22 |   2000 |  27000 |          0.300 | D          |             7 | NULL  |
| EMP_1100    | Kimberly   | Scott     | kimberly.scott@shitmail.com     | Phone-Z      | 1994-11-13 |   2200 |   3000 |          0.600 | B          |             4 | NULL  |
| EMP_1200    | James      | Cooper    | james.cooper@shitmail.com       | Phone-Z      | 1982-08-26 |   2400 |  51000 |          0.800 | B          |             1 | NULL  |
| EMP_1300    | Gloria     | Oconnor   | gloria.oconnor@shitmail.com     | phone-X      | 1989-10-15 |   2600 |  21000 |          0.700 | E          |             5 | NULL  |
| EMP_1400    | Randall    | Chavez    | randall.chavez@gmail.com        | Phone-Y      | 2003-02-08 |   2800 |  33000 |          0.700 | B          |             4 | NULL  |
| EMP_1500    | Nathaniel  | Sandoval  | nathaniel.sandoval@shitmail.com | Phone-Y      | 2013-08-17 |   3000 |  27000 |          0.400 | C          |             2 | NULL  |
| EMP_1600    | Ryan       | Rodriguez | ryan.rodriguez@hotmail.com      | Phone-Z      | 2013-08-17 |   3200 |  21000 |          0.500 | C          |             7 | NULL  |
| EMP_1700    | Rachel     | Dudley    | rachel.dudley@hotmail.com       | phone-X      | 1973-08-10 |   3400 |   3000 |          0.800 | B          |             7 | NULL  |
| EMP_1800    | Cody       | Davis     | cody.davis@gmail.com            | Phone-Y      | 2013-08-17 |   3600 |   6000 |          0.100 | B          |             7 | NULL  |
| EMP_1900    | Yvette     | Sims      | yvette.sims@hotmail.com         | phone-X      | 1982-01-16 |   3800 |      0 |          0.700 | A          |             7 | NULL  |
| EMP_2000    | Bradley    | Harris    | bradley.harris@yoga.com         | phone-X      | 1982-08-26 |   4000 |  36000 |          0.700 | E          |             1 | NULL  |
| EMP_2100    | Joseph     | Rice      | joseph.rice@hotmail.com         | Phone-Z      | 2003-02-08 |   4200 |  78000 |          0.300 | C          |             4 | NULL  |
| EMP_2200    | Brian      | Dunn      | brian.dunn@hotmail.com          | phone-X      | 2011-01-09 |   4400 |   9000 |          0.100 | B          |             7 | NULL  |
| EMP_2300    | Matthew    | Garcia    | matthew.garcia@curemail.com     | phone-X      | 1994-11-13 |   4600 |  15000 |          0.100 | C          |             7 | NULL  |
| EMP_2400    | James      | Mccall    | james.mccall@hotmail.com        | phone-X      | 1997-09-24 |   4800 |  12000 |          0.800 | E          |             7 | NULL  |
| EMP_2500    | Amber      | Pratt     | amber.pratt@curemail.com        | Phone-Z      | 2009-11-30 |   5000 |  63000 |          0.300 | B          |             5 | NULL  |
| EMP_2600    | Christopher | Houston  | christopher.houston@gmail.com   | Phone-Z      | 1982-08-26 |   5200 |  63000 |          0.800 | C          |             1 | NULL  |
| EMP_2700    | Joy        | Hutchinson | joy.hutchinson@gmail.com       | Phone-Z      | 2015-11-23 |   5400 |  60000 |          0.400 | B          |             1 | NULL  |
| EMP_2800    | Linda      | Fisher    | linda.fisher@hotmail.com        | Phone-Y      | 2014-09-14 |   5600 |  21000 |          0.500 | B          |             7 | NULL  |
| EMP_2900    | Megan      | Norton    | megan.norton@gmail.com          | Phone-Z      | 1974-04-29 |   5800 |  78000 |          0.500 | A          |             2 | NULL  |
| EMP_3000    | Ann        | Jackson   | ann.jackson@curemail.com        | Phone-Z      | 1997-12-13 |   6000 |  75000 |          0.200 | B          |             2 | NULL  |
| EMP_3100    | Lisa       | Yoder     | lisa.yoder@firemail.com         | phone-X      | 2015-11-23 |   6200 |  84000 |          0.300 | A          |             5 | NULL  |
| EMP_3200    | Juan       | Ayers     | juan.ayers@hotmail.com          | Phone-Y      | 1974-04-29 |   6400 |  12000 |          0.800 | E          |             7 | NULL  |
| EMP_3300    | Jimmy      | Taylor    | jimmy.taylor@curemail.com       | phone-X      | 1989-10-15 |   6600 |  21000 |          0.800 | E          |             4 | NULL  |
| EMP_3400    | Todd       | Houston   | todd.houston@curemail.com       | phone-X      | 1997-12-13 |   6800 |  57000 |          0.300 | C          |             5 | NULL  |
```

1.
Query to find employees with latest dates

```
SELECT
  first_name,
  last_name,
  email,
  phone_number,
  hire_date,
  department_id
FROM
  employees
where
  hire_date = (
    Select
      max(hire_date)
    from
      employees
  );
```

```
MariaDB [370]> SELECT
    ->   first_name,
    ->   last_name,
    ->   email,
    ->   phone_number,
    ->   hire_date,
    ->   department_id
    -> FROM
    ->   `employees`
    -> where
    ->   hire_date = (
    ->     Select
    ->       max(hire_date)
    ->     from
    ->       employees
    ->   );
+------------+------------+--------------------------+--------------+------------+---------------+
| first_name | last_name  | email                    | phone_number | hire_date  | department_id |
+------------+------------+--------------------------+--------------+------------+---------------+
| Jose       | Chapman    | jose.chapman@curemail.com | Phone-Y      | 2015-11-23 |             2 |
| Joy        | Hutchinson | joy.hutchinson@gmail.com  | Phone-Z      | 2015-11-23 |             1 |
| Lisa       | Yoder      | lisa.yoder@firemail.com   | phone-X      | 2015-11-23 |             5 |
| Richard    | Smith      | richard.smith@hotmail.com | Phone-Y      | 2015-11-23 |             5 |
| Jeffrey    | Shaffer    | jeffrey.shaffer@gmail.com | Phone-Z      | 2015-11-23 |             5 |
+------------+------------+--------------------------+--------------+------------+---------------+
5 rows in set (0.003 sec)
```

2. Query for finding employee with lowest salary in each department

```
Select
  first_name,
  last_name,
  employee_id,
  phone_number,
  salary,
  department_id
from
  employees
where
  (department_id, salary) in (
    Select
      department_id,
      MIN(salary)
    from
      employees
    group by
      department_id
  )
ORDER by
  department_id;
```

```
MariaDB [370]> Select
    ->   first_name,
    ->   last_name,
    ->   employee_id,
    ->   phone_number,
    ->   salary,
    ->   department_id
    -> from
    ->   employees
    -> where
    ->   (department_id, salary) in (
    ->     Select
    ->       department_id,
    ->       MIN(salary)
    ->     from
    ->       employees
    ->     group by
    ->       department_id
    ->   )
    -> ORDER by
    ->   department_id;
+------------+-----------+-------------+--------------+--------+---------------+
| first_name | last_name | employee_id | phone_number | salary | department_id |
+------------+-----------+-------------+--------------+--------+---------------+
| Stacey     | Vasquez   | EMP_9000    | Phone-Z      |   6000 |             1 |
| Austin     | Deleon    | EMP_8900    | Phone-Z      |  24000 |             2 |
| Jimmy      | Glenn     | EMP_6800    | phone-X      |  24000 |             2 |
| Kimberly   | Scott     | EMP_1100    | Phone-Z      |   3000 |             4 |
| Carmen     | Lee       | EMP_800     | Phone-Y      |   3000 |             5 |
| Yvette     | Sims      | EMP_1900    | phone-X      |      0 |             7 |
| Sarah      | Hayes     | EMP_9800    | Phone-Y      |      0 |             7 |
+------------+-----------+-------------+--------------+--------+---------------+
7 rows in set (0.001 sec)

MariaDB [370]>
```

3. Query for question 3,

```
Select
  first_name,
  last_name,
  employee_id,
  commission_pct,
  department_id
from
  employees
where
  department_id = 7
  and commission_pct < (
    Select
      MIN(commission_pct)
```

```
  from
    employees
  where
    department_id = 5
);
```

```
MariaDB [370]> Select
    ->   first_name,
    ->   last_name,
    ->   employee_id,
    ->   commission_pct,
    ->   department_id
    -> from
    ->   employees
    -> where
    ->   department_id = 7
    ->   and commission_pct < (
    ->     Select
    ->       MIN(commission_pct)
    ->     from
    ->       employees
    ->     where
    ->       department_id = 5
    ->   );
Empty set (0.001 sec)

MariaDB [370]>
```

4. Query

```
SELECT
  department_id,
  COUNT(*) as Total_Count
FROM
  employees
GROUP BY
  department_id
having
  MAX(salary) <= 30000;
```

```
MariaDB [370]> SELECT
    ->   department_id,
    ->   COUNT(*) as Total_Count
    -> FROM
    ->   employees
    -> GROUP BY
    ->   department_id
    -> having
    ->   MAX(salary) <= 30000;
+---------------+-------------+
| department_id | Total_Count |
+---------------+-------------+
|             7 |          25 |
+---------------+-------------+
1 row in set (0.002 sec)
```

5. Query

Assuming everyone has a unique job_id thus excluding employees with max_commission_pct solves the problems.

```
SELECT
  department_id,
  job_id,
  commission_pct
from
  employees
where
  commission_pct < any (
    Select
      MAX(commission_pct)
    from
      employees
    group BY
      department_id
  )
ORDER BY
  commission_pct;
```

```
MariaDB [370]> SELECT
    ->   department_id,
    ->   job_id,
    ->   commission_pct
    -> from
    ->   employees
    -> where
    ->   commission_pct < any (
    ->     Select
    ->       MAX(commission_pct)
    ->     from
    ->       employees
    ->     group BY
    ->       department_id
    ->   )
    -> ORDER BY
    ->   commission_pct;
+---------------+--------+----------------+
| department_id | job_id | commission_pct |
+---------------+--------+----------------+
|             7 |   4000 |          0.100 |
|             7 |   3600 |          0.100 |
|             2 |  14200 |          0.100 |
|             5 |  12000 |          0.100 |
|             1 |  11000 |          0.100 |
|             5 |   9400 |          0.100 |
|             1 |   7000 |          0.100 |
|             7 |   4400 |          0.100 |
|             4 |  17200 |          0.100 |
|             4 |   7600 |          0.100 |
|             7 |  19000 |          0.100 |
|             2 |  19200 |          0.100 |
|             4 |  18800 |          0.100 |
|             7 |  12400 |          0.200 |
|             4 |   8200 |          0.200 |
|             2 |   6000 |          0.200 |
|             5 |   9000 |          0.200 |
|             7 |   7400 |          0.200 |
|             4 |  13000 |          0.200 |
|             7 |   8000 |          0.200 |
|             2 |  10200 |          0.200 |
|             5 |   1200 |          0.200 |
|             7 |  14800 |          0.200 |
|             4 |  14400 |          0.200 |
|             4 |  13800 |          0.200 |
|             5 |  10000 |          0.200 |
|             1 |  17000 |          0.300 |
|             4 |  16800 |          0.300 |
|             5 |  10400 |          0.300 |
|             1 |   9800 |          0.300 |
|             7 |  15000 |          0.300 |
|             1 |  18000 |          0.300 |
|             7 |  10800 |          0.300 |
|             2 |  13600 |          0.300 |
|             1 |   7800 |          0.300 |
|             5 |   5000 |          0.300 |
|             7 |   2000 |          0.300 |
|             4 |   4200 |          0.300 |
|             5 |   6200 |          0.300 |
|             5 |   6800 |          0.300 |
|             5 |   1000 |          0.300 |
|             1 |  11400 |          0.400 |
|             4 |  12000 |          0.400 |
|             2 |   3000 |          0.400 |
|             1 |   5400 |          0.400 |
|             7 |   8000 |          0.400 |
|             7 |   1800 |          0.400 |
|             1 |  10000 |          0.400 |
|             7 |  10200 |          0.400 |
|             1 |  15400 |          0.500 |
|             1 |  18400 |          0.500 |
|             5 |  15000 |          0.500 |
|             5 |  19000 |          0.500 |
|             7 |   3200 |          0.500 |
|             2 |   5800 |          0.500 |
|             5 |   7200 |          0.500 |
|             2 |  10400 |          0.500 |
|             7 |   5000 |          0.500 |
|             4 |   9000 |          0.500 |
|             1 |  11800 |          0.500 |
|             4 |   2200 |          0.600 |
|             2 |   1000 |          0.600 |
|             1 |   1400 |          0.600 |
|             5 |  13200 |          0.600 |
|             1 |  18200 |          0.600 |
|             7 |  13400 |          0.600 |
|             4 |  19000 |          0.600 |
|             1 |    400 |          0.600 |
|             7 |  14000 |          0.600 |
|             4 |    600 |          0.600 |
|             1 |  12200 |          0.600 |
|             4 |  18000 |          0.700 |
|             7 |    800 |          0.700 |
|             5 |   8800 |          0.700 |
|             5 |   8400 |          0.700 |
|             5 |  19400 |          0.700 |
|             2 |  17800 |          0.700 |
|             1 |   4000 |          0.700 |
|             7 |   3800 |          0.700 |
|             7 |    200 |          0.700 |
|             4 |   2800 |          0.700 |
|             7 |  15200 |          0.700 |
|             5 |   2600 |          0.700 |
|             5 |  15800 |          0.700 |
|             4 |  12800 |          0.700 |
|             5 |  10000 |          0.700 |
|             5 |  20000 |          0.700 |
+---------------+--------+----------------+
87 rows in set (0.002 sec)

MariaDB [370]> --
```

6. Query,

```
SELECT
  manager_id
FROM
  employees
GROUP BY
  manager_id
```

```
having
  MIN(salary) >= 3500;
```

```
MariaDB [370]> SELECT
    ->   manager_id
    -> FROM
    ->   employees
    -> GROUP BY
    ->   manager_id
    -> having
    ->   MIN(salary) >= 3500;
+------------+
| manager_id |
+------------+
| D          |
| E          |
+------------+
2 rows in set (0.001 sec)

MariaDB [370]>
```

7. Query

```
Select
  first_name,
  last_name,
  employee_id,
  email,
  salary,
  department_id,
  commission_pct
from
  employees
where
  (manager_id, commission_pct) in (
    Select
      manager_id,
      MIN(commission_pct)
    from
      employees
    group by
```

```
    manager_id
  )
ORDER by
  department_id;
```

```
MariaDB [370]> Select
    ->   first_name,
    ->   last_name,
    ->   employee_id,
    ->   email,
    ->   salary,
    ->   department_id,
    ->   commission_pct
    -> from
    ->   employees
    -> where
    ->   (manager_id, commission_pct) in (
    ->     Select
    ->       manager_id,
    ->       MIN(commission_pct)
    ->     from
    ->       employees
    ->     group by
    ->       manager_id
    ->   )
    -> ORDER by
    ->   department_id;
+------------+-----------+-------------+--------------------------------+--------+--------------+----------------+
| first_name | last_name | employee_id | email                          | salary | department_id | commission_pct |
+------------+-----------+-------------+--------------------------------+--------+--------------+----------------+
| Kevin      | Rios      | EMP_3500    | kevin.rios@shitmail.com        |  12000 |            1 |          0.100 |
| Nicole     | Martin    | EMP_5800    | nicole.martin@shitmail.com     |  60000 |            1 |          0.100 |
| Andrew     | Martinez  | EMP_7100    | andrew.martinez@yoga.com       |  60000 |            2 |          0.100 |
| Kayla      | Ali       | EMP_9600    | kayla.ali@shitmail.com         |  42000 |            2 |          0.100 |
| John       | Pearson   | EMP_8600    | john.pearson@curemail.com      |  42000 |            4 |          0.100 |
| Cheryl     | Bryant    | EMP_9400    | cheryl.bryant@hotmail.com      |  15000 |            4 |          0.100 |
| Jason      | Johnson   | EMP_3800    | jason.johnson@curemail.com     |  24000 |            4 |          0.100 |
| Jessica    | Robertson | EMP_6000    | jessica.robertson@shitmail.com |  45000 |            5 |          0.100 |
| Christopher | Garcia   | EMP_4700    | christopher.garcia@curemail.com |  87000 |            5 |          0.100 |
| Brian      | Dunn      | EMP_2200    | brian.dunn@hotmail.com         |   9000 |            7 |          0.100 |
| Cody       | Davis     | EMP_1800    | cody.davis@gmail.com           |   6000 |            7 |          0.100 |
| Sarah      | Hayes     | EMP_9800    | sarah.hayes@gmail.com          |      0 |            7 |          0.100 |
| Matthew    | Garcia    | EMP_2300    | matthew.garcia@curemail.com    |  15000 |            7 |          0.100 |
+------------+-----------+-------------+--------------------------------+--------+--------------+----------------+
13 rows in set (0.004 sec)
```