CSE370 : DATABASE SYSTEMS

LAB HOMEWORK - 3

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SECTION : 05

```sql
create database Jobs;

use Jobs;

create table employees(
employee_id char(10),
first_name varchar(20),
last_name varchar(20),
email varchar(60),
phone_number char(14),
hire_date date,
job_id char(10),
salary int,
commission_pct decimal(5,3),
manager_id char(10),
department_id char(10)
);

describe employees;

insert into employees values
('EMP001','Evan','You','evan.you@gmail.com','01234567890123','2023-01-09','JOB001',2000,12.125,'MNG002','DPT001'),
('EMP002','Taylor','Otwell','taylor.otwell@gmail.com','12345678901234','2023-02-01','JOB002',30000,45.091,'MNG001','DPT002'),
('EMP003','Ryan','Dahl','rayan.dahl@gmail.com','23456789012345','2021-10-18','JOB003',45000,50.981,'MNG002','DPT003'),
('EMP004','Brendan','Eich','brendan.eich@gmail.com','34567890123456','2020-11-25','JOB004',15000,20.765,'MNG003','DPT004'),
('EMP005','Rasmus','Lerdorf','rasmus.lerdorf@gmail.com','45678901234567','2019-12-05','JOB005',50000,79.076,'MNG001','DPT005'),
('EMP006','Adrian','Holovaty','adrian.holovaty@gmail.com','56789012345678','2023-01-31','JOB006',24000,35.101,'MNG003','DPT005'),
('EMP007','Simon','Willison','simon.willison@gmail.com','67890123456789','2019-06-17','JOB007',67000,82.119,'MNG002','DPT005'),
('EMP008','James','Gosling','james.gosling@gmail.com','78901234567890','2009-10-29','JOB008',1000000,98.578,'MNG001','DPT002'),
('EMP009','Rod','Johnson','rod.johnson@gmail.com','89012345678901','2023-01-19','JOB009',98000,95.087,'MNG003','DPT001'),
```

('EMP010','Satoshi','Nakamoto','satoshi.nakamoto@gmail.com','90123456789012','2020-05-19','JOB010',5000,10.924,'MNG001','DPT006'),
('EMP011','Angela','Martin','angela.martin@gmail.com','01234567890123','2021-03-29','JOB011',68000,78.914,'MNG002','DPT007'),
('EMP012','Kevin','Malone','kevin.malone@gmail.com','12345678901234','2022-02-20','JOB012',31000,34.917,'MNG002','DPT007')
;

select * from employees;

```
MariaDB [(none)]> create database Jobs;
Query OK, 1 row affected (0.002 sec)

MariaDB [(none)]> use Jobs;
Database changed
MariaDB [Jobs]> create table employees(
    -> employee_id char(10),
    -> first_name varchar(20),
    -> last_name varchar(20),
    -> email varchar(60),
    -> phone_number char(14),
    -> hire_date date,
    -> job_id char(10),
    -> salary int,
    -> commission_pct decimal(5,3),
    -> manager_id char(10),
    -> department_id char(10)
    -> );
Query OK, 0 rows affected (0.017 sec)

MariaDB [Jobs]> describe employees;
+----------------+---------------+------+-----+---------+-------+
| Field          | Type          | Null | Key | Default | Extra |
+----------------+---------------+------+-----+---------+-------+
| employee_id    | char(10)      | YES  |     | NULL    |       |
| first_name     | varchar(20)   | YES  |     | NULL    |       |
| last_name      | varchar(20)   | YES  |     | NULL    |       |
| email          | varchar(60)   | YES  |     | NULL    |       |
| phone_number   | char(14)      | YES  |     | NULL    |       |
| hire_date      | date          | YES  |     | NULL    |       |
| job_id         | char(10)      | YES  |     | NULL    |       |
| salary         | int(11)       | YES  |     | NULL    |       |
| commission_pct | decimal(5,3)  | YES  |     | NULL    |       |
| manager_id     | char(10)      | YES  |     | NULL    |       |
| department_id  | char(10)      | YES  |     | NULL    |       |
+----------------+---------------+------+-----+---------+-------+
11 rows in set (0.034 sec)
```

```
MariaDB [Jobs]> insert into employees values
    -> ('EMP001','Evan','You','evan.you@gmail.com','01234567890123','2023-01-09','JOB001',2000,12.125,'MNG002','DPT001'),
    -> ('EMP002','Taylor','Otwell','taylor.otwell@gmail.com','12345678901234','2023-02-01','JOB002',30000,45.091,'MNG001','DPT002'),
    -> ('EMP003','Ryan','Dahl','rayan.dahl@gmail.com','23456789012345','2021-10-18','JOB003',45000,50.981,'MNG002','DPT003'),
    -> ('EMP004','Brendan','Eich','brendan.eich@gmail.com','34567890123456','2020-11-25','JOB004',15000,20.765,'MNG003','DPT004'),
    -> ('EMP005','Rasmus','Lerdorf','rasmus.lerdorf@gmail.com','45678901234567','2019-12-05','JOB005',50000,79.076,'MNG001','DPT005'),
    -> ('EMP006','Adrian','Holovaty','adrian.holovaty@gmail.com','56789012345678','2023-01-31','JOB006',24000,35.101,'MNG003','DPT005'),
    -> ('EMP007','Simon','Willison','simon.willison@gmail.com','67890123456789','2019-06-17','JOB007',67000,82.119,'MNG002','DPT005'),
    -> ('EMP008','James','Gosling','james.gosling@gmail.com','78901234567890','2009-10-29','JOB008',1000000,98.578,'MNG001','DPT002'),
    -> ('EMP009','Rod','Johnson','rod.johnson@gmail.com','89012345678901','2023-01-19','JOB009',98000,95.087,'MNG003','DPT001'),
    -> ('EMP010','Satoshi','Nakamoto','satoshi.nakamoto@gmail.com','90123456789012','2020-05-19','JOB010',5000,10.924,'MNG001','DPT006'),
    -> ('EMP011','Angela','Martin','angela.martin@gmail.com','01234567890123','2021-03-29','JOB011',68000,78.914,'MNG002','DPT007'),
    -> ('EMP012','Kevin','Malone','kevin.malone@gmail.com','12345678901234','2022-02-20','JOB012',31000,34.917,'MNG002','DPT007')
    -> ;
Query OK, 12 rows affected (0.005 sec)
Records: 12  Duplicates: 0  Warnings: 0

MariaDB [Jobs]> select * from employees;
+-------------+------------+-----------+----------------------------+----------------+------------+--------+---------+----------------+------------+---------------+
| employee_id | first_name | last_name | email                      | phone_number   | hire_date  | job_id | salary  | commission_pct | manager_id | department_id |
+-------------+------------+-----------+----------------------------+----------------+------------+--------+---------+----------------+------------+---------------+
| EMP001      | Evan       | You       | evan.you@gmail.com         | 01234567890123 | 2023-01-09 | JOB001 |    2000 |         12.125 | MNG002     | DPT001        |
| EMP002      | Taylor     | Otwell    | taylor.otwell@gmail.com    | 12345678901234 | 2023-02-01 | JOB002 |   30000 |         45.091 | MNG001     | DPT002        |
| EMP003      | Ryan       | Dahl      | rayan.dahl@gmail.com       | 23456789012345 | 2021-10-18 | JOB003 |   45000 |         50.981 | MNG002     | DPT003        |
| EMP004      | Brendan    | Eich      | brendan.eich@gmail.com     | 34567890123456 | 2020-11-25 | JOB004 |   15000 |         20.765 | MNG003     | DPT004        |
| EMP005      | Rasmus     | Lerdorf   | rasmus.lerdorf@gmail.com   | 45678901234567 | 2019-12-05 | JOB005 |   50000 |         79.076 | MNG001     | DPT005        |
| EMP006      | Adrian     | Holovaty  | adrian.holovaty@gmail.com  | 56789012345678 | 2023-01-31 | JOB006 |   24000 |         35.101 | MNG003     | DPT005        |
| EMP007      | Simon      | Willison  | simon.willison@gmail.com   | 67890123456789 | 2019-06-17 | JOB007 |   67000 |         82.119 | MNG002     | DPT005        |
| EMP008      | James      | Gosling   | james.gosling@gmail.com    | 78901234567890 | 2009-10-29 | JOB008 | 1000000 |         98.578 | MNG001     | DPT002        |
| EMP009      | Rod        | Johnson   | rod.johnson@gmail.com      | 89012345678901 | 2023-01-19 | JOB009 |   98000 |         95.087 | MNG003     | DPT001        |
| EMP010      | Satoshi    | Nakamoto  | satoshi.nakamoto@gmail.com | 90123456789012 | 2020-05-19 | JOB010 |    5000 |         10.924 | MNG001     | DPT006        |
| EMP011      | Angela     | Martin    | angela.martin@gmail.com    | 01234567890123 | 2021-03-29 | JOB011 |   68000 |         78.914 | MNG002     | DPT007        |
| EMP012      | Kevin      | Malone    | kevin.malone@gmail.com     | 12345678901234 | 2022-02-20 | JOB012 |   31000 |         34.917 | MNG002     | DPT007        |
+-------------+------------+-----------+----------------------------+----------------+------------+--------+---------+----------------+------------+---------------+
12 rows in set (0.001 sec)
```

Answer 1 :

Select first_name,last_name,email,employee_id,phone_number,hire_date from employees where hire_date = (select max(hire_date) from employees);

```
MariaDB [Jobs]> 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 |
+------------+-----------+-------------------------+----------------+------------+---------------+
| Taylor     | Otwell    | taylor.otwell@gmail.com | 12345678901234 | 2023-02-01 | DPT002        |
+------------+-----------+-------------------------+----------------+------------+---------------+
1 row in set (0.001 sec)
```

Answer 2 :

Select first_name,last_name,employee_id,phone_number,salary,department_id from employees group by department_id having min(salary);

```
MariaDB [Jobs]> select first_name,last_name,employee_id,phone_number,
    -> salary,department_id from employees group by department_id
    -> having min(salary);
+------------+-----------+-------------+----------------+--------+---------------+
| first_name | last_name | employee_id | phone_number   | salary | department_id |
+------------+-----------+-------------+----------------+--------+---------------+
| Evan       | You       | EMP001      | 01234567890123 |   2000 | DPT001        |
| Taylor     | Otwell    | EMP002      | 12345678901234 |  30000 | DPT002        |
| Ryan       | Dahl      | EMP003      | 23456789012345 |  45000 | DPT003        |
| Brendan    | Eich      | EMP004      | 34567890123456 |  15000 | DPT004        |
| Rasmus     | Lerdorf   | EMP005      | 45678901234567 |  50000 | DPT005        |
| Satoshi    | Nakamoto  | EMP010      | 90123456789012 |   5000 | DPT006        |
| Angela     | Martin    | EMP011      | 01234567890123 |  68000 | DPT007        |
+------------+-----------+-------------+----------------+--------+---------------+
7 rows in set (0.000 sec)
```

Answer 3 :

Select first_name,last_name,employee_id,commission_pct,department_id from employees where department_id = 'DPT007' and commission_pct < all (select commission_pct from employees where department_id = 'DPT005');

```
MariaDB [Jobs]> select first_name,last_name,employee_id,commission_pct,
    -> department_id from employees where department_id = 'DPT007' and
    -> commission_pct < all (select commission_pct from employees where
    -> department_id = 'DPT005');
+------------+-----------+-------------+----------------+---------------+
| first_name | last_name | employee_id | commission_pct | department_id |
+------------+-----------+-------------+----------------+---------------+
| Kevin      | Malone    | EMP012      |         34.917 | DPT007        |
+------------+-----------+-------------+----------------+---------------+
1 row in set (0.000 sec)
```

Answer 4 :

Select department_id,count(*) from employees E1 where not exists (select * from employees E2 where E1.department_id = E2.department_id and salary > 30000) group by department_id;

```
MariaDB [Jobs]> select department_id,count(*) from employees E1 where not exists
    -> (select * from employees E2 where E1.department_id = E2.department_id
    -> and salary > 30000) group by department_id;
+---------------+----------+
| department_id | count(*) |
+---------------+----------+
| DPT004        |        1 |
| DPT006        |        1 |
+---------------+----------+
2 rows in set (0.002 sec)
```

Answer 5 :

Select department_id,job_id,commission_pct from employees E1 where not exists (select * from employees E2 where E1.department_id = E2.department_id and E1.job_id != E2.job_id and E1.commission_pct > E2.commission_pct) group by department_id;

```
MariaDB [Jobs]> select department_id,job_id,commission_pct
    -> from employees E1 where not exists (select * from
    -> employees E2 where E1.department_id = E2.department_id
    -> and E1.job_id != E2.job_id and E1.commission_pct >
    -> E2.commission_pct) group by department_id;
+---------------+--------+----------------+
| department_id | job_id | commission_pct |
+---------------+--------+----------------+
| DPT001        | JOB001 |         12.125 |
| DPT002        | JOB002 |         45.091 |
| DPT003        | JOB003 |         50.981 |
| DPT004        | JOB004 |         20.765 |
| DPT005        | JOB006 |         35.101 |
| DPT006        | JOB010 |         10.924 |
| DPT007        | JOB012 |         34.917 |
+---------------+--------+----------------+
```

Answer 6 :

Select manager_id from employees E1 where not exists (select * from employees E2 where E1.manager_id = E2.manager_id and salary < 3500) group by manager_id;

```
MariaDB [Jobs]> select manager_id from employees E1 where not exists
    -> (select * from employees E2 where E1.manager_id = E2.manager_id
    -> and salary < 3500) group by manager_id;
+------------+
| manager_id |
+------------+
| MNG001     |
| MNG003     |
+------------+
2 rows in set (0.001 sec)
```

Answer 7 :

Select first_name,last_name,employee_id,email,salary,department_id,commission_pct from employees E1 where exists (select * from employees E2 where E1.manager_id = E2.manager_id and E1.commission_pct < E2.commission_pct) group by manager_id ;

```
MariaDB [Jobs]> select first_name,last_name,employee_id,email,salary,department_id,
    -> commission_pct from employees E1 where exists (select * from employees E2
    -> where E1.manager_id = E2.manager_id and E1.commission_pct < E2.commission_pct)
    -> group by manager_id;
+------------+-----------+-------------+---------------------------+--------+---------------+----------------+
| first_name | last_name | employee_id | email                     | salary | department_id | commission_pct |
+------------+-----------+-------------+---------------------------+--------+---------------+----------------+
| Satoshi    | Nakamoto  | EMP010      | satoshi.nakamoto@gmail.com |  5000  | DPT006        |         10.924 |
| Evan       | You       | EMP001      | evan.you@gmail.com        |  2000  | DPT001        |         12.125 |
| Brendan    | Eich      | EMP004      | brendan.eich@gmail.com    | 15000  | DPT004        |         20.765 |
+------------+-----------+-------------+---------------------------+--------+---------------+----------------+
3 rows in set (0.001 sec)
```