```
Setting environment for using XAMPP for Windows.
Asus@EMON e:\Xamp
# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.4.32-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

create database LAB_2;


```
MariaDB [(none)]> create database LAB_2;
Query OK, 1 row affected (0.001 sec)
```

Use LAB_2;
CREATE TABLE Employee (
    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)
);

```
MariaDB [(none)]> use LAB_2;
Database changed
MariaDB [LAB_2]> CREATE TABLE Employee (
    ->      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 (0.005 sec)
```

describe employee;

```
MariaDB [LAB_2]> describe Employee;
+----------------+--------------+------+-----+---------+-------+
| 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 (0.019 sec)
```

INSERT INTO Employee (employee_id, first_name, last_name, email, phone_number, hire_date, job_id, salary, commission_pct, manager_id, department_id)
VALUES
('EMP001', 'Shoaib', 'Ahmed', 'shoiab.ahmed@bracu.ac.bd', '123-456-7890', '2023-01-01', 'JOB001', 50000, 0.100, 'MNG001', 'DPT001'),
('EMP002', 'Dewan', 'Karim', 'dewan.karim@bracu.ac.bd', '123-456-7891', '2023-02-01', 'JOB002', 60000, 0.200, 'MNG001', 'DPT002'),
('EMP003', 'Farida', 'Chowdhury', 'farida.chowdhury@bracu.ac.bd', '123-456-7892', '2023-03-01', 'JOB003', 45000, 0.150, 'MNG002', 'DPT003'),

('EMP004', 'Farden', 'Khan', 'farden.khan@bracu.ac.bd', '123-456-7893', '2023-04-01', 'JOB004', 55000, 0.050, 'MNG002', 'DPT004'),
('EMP005', 'Fakhruddin', 'Gazzali', 'fakhruddin.gazzali@bracu.ac.bd', '123-456-7894', '2023-05-01', 'JOB005', 70000, 0.300, 'MNG003', 'DPT005'),
('EMP006', 'Farhan', 'Feroz', 'farhan.feroz@bracu.ac.bd', '123-456-7895', '2023-06-01', 'JOB006', 40000, 0.400, 'MNG003', 'DPT006'),
('EMP007', 'Fatiha', 'Chowdhury', 'fatiha.chowdhury@bracu.ac.bd', '123-456-7896', '2023-07-01', 'JOB007', 30000, 0.250, 'MNG004', 'DPT007'),
('EMP008', 'Faisal', 'Ahmed', 'faisal.ahmed@bracu.ac.bd', '123-456-7897', '2023-03-01', 'JOB008', 80000, 0.350, 'MNG004', 'DPT001'),
('EMP009', 'Farig', 'Sadeque', 'farig.sadeque@bracu.ac.bd', '123-456-7898', '2023-09-01', 'JOB009', 20000, 0.450, 'MNG005', 'DPT002'),
('EMP010', 'Fardin', 'Nafis', 'fardin.nafis@bracu.ac.bd', '123-456-7899', '2023-10-01', 'JOB010', 35000, 0.500, 'MNG005', 'DPT003'),
('EMP011', 'Golam', 'Alam', 'golam.alam@bracu.ac.bd', '123-456-7900', '2023-11-01', 'JOB011', 40000, 0.250, 'MNG006', 'DPT004'),
('EMP012', 'Himaddri', 'Roy', 'himaddri.roy@bracu.ac.bd', '123-456-7901', '2023-12-01', 'JOB012', 60000, 0.200, 'MNG006', 'DPT005'),
('EMP013', 'Ipshita', 'Upoma', 'ipshita.upoma@bracu.ac.bd', '123-456-7902', '2024-01-01', 'JOB013', 50000, 0.100, 'MNG007', 'DPT006'),
('EMP014', 'Ishrat', 'Jahan', 'ishrat.jahan@bracu.ac.bd', '123-456-7903', '2024-03-01', 'JOB014', 45000, 0.150, 'MNG007', 'DPT007'),
('EMP015', 'Imam', 'Zulkarnain', 'imam.zulkarnain@bracu.ac.bd', '123-456-7904', '2024-03-01', 'JOB015', 55000, 0.050, 'MNG008', 'DPT001');

```
MariaDB [LAB_2]> INSERT INTO Employee (employee_id, first_name, last_name, email, phone_number, hire_date, job_id, salary, commission_pct, manager_id, department_id)
    -> VALUES
    -> ('EMP001', 'Shoaib', 'Ahmed', 'shoaib.ahmed@bracu.ac.bd', '123-456-7890', '2023-01-01', 'JOB001', 50000, 0.100, 'MNG001', 'DPT001'),
    -> ('EMP002', 'Dewan', 'Karim', 'dewan.karim@bracu.ac.bd', '123-456-7891', '2023-02-01', 'JOB002', 60000, 0.200, 'MNG001', 'DPT002'),
    -> ('EMP003', 'Farida', 'Chowdhury', 'farida.chowdhury@bracu.ac.bd', '123-456-7892', '2023-03-01', 'JOB003', 45000, 0.150, 'MNG002', 'DPT003'),
    -> ('EMP004', 'Farden', 'Khan', 'farden.khan@bracu.ac.bd', '123-456-7893', '2023-04-01', 'JOB004', 55000, 0.050, 'MNG002', 'DPT004'),
    -> ('EMP005', 'Fakhruddin', 'Gazzali', 'fakhruddin.gazzali@bracu.ac.bd', '123-456-7894', '2023-05-01', 'JOB005', 70000, 0.300, 'MNG003', 'DPT005'),
    -> ('EMP006', 'Farhan', 'Feroz', 'farhan.feroz@bracu.ac.bd', '123-456-7895', '2023-06-01', 'JOB006', 40000, 0.400, 'MNG003', 'DPT006'),
    -> ('EMP007', 'Fatiha', 'Chowdhury', 'fatiha.chowdhury@bracu.ac.bd', '123-456-7896', '2023-07-01', 'JOB007', 30000, 0.250, 'MNG004', 'DPT007'),
    -> ('EMP008', 'Faisal', 'Ahmed', 'faisal.ahmed@bracu.ac.bd', '123-456-7897', '2023-03-01', 'JOB008', 80000, 0.350, 'MNG004', 'DPT001'),
    -> ('EMP009', 'Farig', 'Sadeque', 'farig.sadeque@bracu.ac.bd', '123-456-7898', '2023-09-01', 'JOB009', 20000, 0.450, 'MNG005', 'DPT002'),
    -> ('EMP010', 'Fardin', 'Nafis', 'fardin.nafis@bracu.ac.bd', '123-456-7899', '2023-10-01', 'JOB010', 35000, 0.500, 'MNG005', 'DPT003'),
    -> ('EMP011', 'Golam', 'Alam', 'golam.alam@bracu.ac.bd', '123-456-7900', '2023-11-01', 'JOB011', 40000, 0.250, 'MNG006', 'DPT004'),
    -> ('EMP012', 'Himaddri', 'Roy', 'himaddri.roy@bracu.ac.bd', '123-456-7901', '2023-12-01', 'JOB012', 60000, 0.200, 'MNG006', 'DPT005'),
    -> ('EMP013', 'Ipshita', 'Upoma', 'ipshita.upoma@bracu.ac.bd', '123-456-7902', '2024-01-01', 'JOB013', 50000, 0.100, 'MNG007', 'DPT006'),
    -> ('EMP014', 'Ishrat', 'Jahan', 'ishrat.jahan@bracu.ac.bd', '123-456-7903', '2024-03-01', 'JOB014', 45000, 0.150, 'MNG007', 'DPT007'),
    -> ('EMP015', 'Imam', 'Zulkarnain', 'imam.zulkarnain@bracu.ac.bd', '123-456-7904', '2024-03-01', 'JOB015', 55000, 0.050, 'MNG008', 'DPT001');
Query OK, 15 rows affected (0.008 sec)
Records: 15  Duplicates: 0  Warnings: 0
```

Select * from Employees;

```
MariaDB [LAB_2]> select * from employee;
+-------------+------------+------------+---------------------------------+--------------+------------+--------+--------+----------------+------------+---------------+
| employee_id | first_name | last_name  | email                           | phone_number | hire_date  | job_id | salary | commission_pct | manager_id | department_id |
+-------------+------------+------------+---------------------------------+--------------+------------+--------+--------+----------------+------------+---------------+
| EMP001      | Shoaib     | Ahmed      | shoaib.ahmed@bracu.ac.bd        | 123-456-7890 | 2023-01-01 | JOB001 | 50000  | 0.100          | MNG001     | DPT001        |
| EMP002      | Dewan      | Karim      | dewan.karim@bracu.ac.bd         | 123-456-7891 | 2023-02-01 | JOB002 | 60000  | 0.200          | MNG001     | DPT002        |
| EMP003      | Farida     | Chowdhury  | farida.chowdhury@bracu.ac.bd    | 123-456-7892 | 2023-03-01 | JOB003 | 45000  | 0.150          | MNG002     | DPT003        |
| EMP004      | Farden     | Khan       | farden.khan@bracu.ac.bd         | 123-456-7893 | 2023-04-01 | JOB004 | 55000  | 0.050          | MNG002     | DPT004        |
| EMP005      | Fakhruddin | Gazzali    | fakhruddin.gazzali@bracu.ac.bd  | 123-456-7894 | 2023-05-01 | JOB005 | 70000  | 0.300          | MNG003     | DPT005        |
| EMP006      | Farhan     | Feroz      | farhan.feroz@bracu.ac.bd        | 123-456-7895 | 2023-06-01 | JOB006 | 40000  | 0.400          | MNG003     | DPT006        |
| EMP007      | Fatiha     | Chowdhury  | fatiha.chowdhury@bracu.ac.bd    | 123-456-7896 | 2023-07-01 | JOB007 | 30000  | 0.250          | MNG004     | DPT007        |
| EMP008      | Faisal     | Ahmed      | faisal.ahmed@bracu.ac.bd        | 123-456-7897 | 2023-03-01 | JOB008 | 80000  | 0.350          | MNG004     | DPT001        |
| EMP009      | Farig      | Sadeque    | farig.sadeque@bracu.ac.bd       | 123-456-7898 | 2023-09-01 | JOB009 | 20000  | 0.450          | MNG005     | DPT002        |
| EMP010      | Fardin     | Nafis      | fardin.nafis@bracu.ac.bd        | 123-456-7899 | 2023-10-01 | JOB010 | 35000  | 0.500          | MNG005     | DPT003        |
| EMP011      | Golam      | Alam       | golam.alam@bracu.ac.bd          | 123-456-7900 | 2023-11-01 | JOB011 | 40000  | 0.250          | MNG006     | DPT004        |
| EMP012      | Himaddri   | Roy        | himaddri.roy@bracu.ac.bd        | 123-456-7901 | 2023-12-01 | JOB012 | 60000  | 0.200          | MNG006     | DPT005        |
| EMP013      | Ipshita    | Upoma      | ipshita.upoma@bracu.ac.bd       | 123-456-7902 | 2024-01-01 | JOB013 | 50000  | 0.100          | MNG007     | DPT006        |
| EMP014      | Ishrat     | Jahan      | ishrat.jahan@bracu.ac.bd        | 123-456-7903 | 2024-03-01 | JOB014 | 45000  | 0.150          | MNG007     | DPT007        |
| EMP015      | Imam       | Zulkarnain | imam.zulkarnain@bracu.ac.bd     | 123-456-7904 | 2024-03-01 | JOB015 | 55000  | 0.050          | MNG008     | DPT001        |
+-------------+------------+------------+---------------------------------+--------------+------------+--------+--------+----------------+------------+---------------+
15 rows in set (0.000 sec)
```

1. Find the **first_name, last_name, email, phone_number, hire_date** and **department_id** of all the employees with the latest **hire_date**.

select first_name, last_name, email, phone_number, hire_date,
department_id from Employee where hire_date = (select MAX(hire_date)
from Employee);

```
MariaDB [LAB_2]> select first_name, last_name, email, phone_number, hire_date,
    -> department_id from Employee where hire_date = (select MAX(hire_date)
    -> from Employee);
+------------+------------+------------------------------+--------------+------------+---------------+
| first_name | last_name  | email                        | phone_number | hire_date  | department_id |
+------------+------------+------------------------------+--------------+------------+---------------+
| Ishrat     | Jahan      | ishrat.jahan@bracu.ac.bd     | 123-456-7903 | 2024-03-01 | DPT007        |
| Imam       | Zulkarnain | imam.zulkarnain@bracu.ac.bd  | 123-456-7904 | 2024-03-01 | DPT001        |
+------------+------------+------------------------------+--------------+------------+---------------+
2 rows in set (0.001 sec)
```

*2. Find the **first_name, last_name, employee_id, phone_number, salary** and **department_id** of all the employees with the lowest **salary** in each department.*

select first_name, last_name, employee_id, phone_number, salary, department_id
from Employee
where salary = (
    select min(salary)
    from Employee AS e1
    where e1.department_id = Employee.department_id
);

```
MariaDB [LAB_2]> select first_name, last_name, employee_id, phone_number, salary, department_id
    -> from Employee
    -> where salary = (
    ->      select min(salary)
    ->      from Employee AS e1
    ->      where e1.department_id = Employee.department_id
    -> );
+------------+------------+-------------+--------------+--------+---------------+
| first_name | last_name  | employee_id | phone_number | salary | department_id |
+------------+------------+-------------+--------------+--------+---------------+
| Shoaib     | Ahmed      | EMP001      | 123-456-7890 | 50000  | DPT001        |
| Farhan     | Feroz      | EMP006      | 123-456-7895 | 40000  | DPT006        |
| Fatiha     | Chowdhury  | EMP007      | 123-456-7896 | 30000  | DPT007        |
| Farig      | Sadeque    | EMP009      | 123-456-7898 | 20000  | DPT002        |
| Fardin     | Nafis      | EMP010      | 123-456-7899 | 35000  | DPT003        |
| Golam      | Alam       | EMP011      | 123-456-7900 | 40000  | DPT004        |
| Himaddri   | Roy        | EMP012      | 123-456-7901 | 60000  | DPT005        |
+------------+------------+-------------+--------------+--------+---------------+
7 rows in set (0.001 sec)
```

3. Find the **first_name**, **last_name**, **employee_id**, **commission_pct** and **department_id** of all the employees in the department 'DPT007' who have a lower commission_pct than all of the department 'DPT005' employees.

select first_name, last_name, employee_id, commission_pct, department_id from Employee where department_id = 'DPT007' and commission_pct < (select min(commission_pct) from Employee where department_id = 'DPT005');

```
MariaDB [LAB_2]> select first_name, last_name, employee_id, commission_pct, department_id
    -> from Employee
    -> where department_id = 'DPT007'
    -> and commission_pct < (
    ->     select min(commission_pct)
    ->     from Employee
    ->     where department_id = 'DPT005'
    -> );
+------------+-----------+-------------+----------------+---------------+
| first_name | last_name | employee_id | commission_pct | department_id |
+------------+-----------+-------------+----------------+---------------+
| Ishrat     | Jahan     | EMP014      |          0.150 | DPT007        |
+------------+-----------+-------------+----------------+---------------+
1 row in set (0.006 sec)

MariaDB [LAB_2]>
```

4. Find the **department_id** and total number of employees of each department which does not have a single employee under it with a **salary** more than 30,000.

select department_id, count(*) as total_employee from Employee
group by department_id
having max(salary) <= 30000;

```
MariaDB [LAB_2]> select department_id, count(*) as total_employee from Employee
    -> group by department_id
    -> having max(salary) <= 30000;
Empty set (0.008 sec)
```

5. For each department, find the **department_id**, **job_id** and **commission_pct** with **commission_pct** less than at least one other **job_id** in that department.

select department_id, job_id, commission_pct
from Employee e1
where commission_pct < (
    select MAX(e2.commission_pct)
    from Employee e2
    where e2.department_id = e1.department_id
);

```
MariaDB [LAB_2]> SELECT department_id, job_id, commission_pct
    -> FROM Employee e1
    -> WHERE commission_pct < (
    ->      SELECT MAX(e2.commission_pct)
    ->      FROM Employee e2
    ->      WHERE e2.department_id = e1.department_id
    -> );
+---------------+---------+----------------+
| department_id | job_id  | commission_pct |
+---------------+---------+----------------+
| DPT001        | JOB001  |          0.100 |
| DPT002        | JOB002  |          0.200 |
| DPT003        | JOB003  |          0.150 |
| DPT004        | JOB004  |          0.050 |
| DPT005        | JOB012  |          0.200 |
| DPT006        | JOB013  |          0.100 |
| DPT007        | JOB014  |          0.150 |
| DPT001        | JOB015  |          0.050 |
+---------------+---------+----------------+
8 rows in set (0.001 sec)
```

6. Find the **manager_id** who does not have any employee under them with a **salary less than 3500.**

select DISTINCT manager_id from Employee AS e1 where NOT EXISTS (SELECT 1 from Employee AS e2 where e2.manager_id = e1.manager_id AND e2.salary < 3500);

```
MariaDB [LAB_2]> SELECT DISTINCT manager_id
    -> FROM Employee AS e1
    -> WHERE NOT EXISTS (
    ->      SELECT 1
    ->      FROM Employee AS e2
    ->      WHERE e2.manager_id = e1.manager_id
    ->         AND e2.salary < 3500
    -> );
+------------+
| manager_id |
+------------+
| MNG001     |
| MNG002     |
| MNG003     |
| MNG004     |
| MNG005     |
| MNG006     |
| MNG007     |
| MNG008     |
+------------+
8 rows in set (0.005 sec)
```

*7. Find the **first_name, last_name, employee_id, email, salary, department_id** and **commission_pct** of the employee with the lowest **commission_pct** under each manager.*

select first_name, last_name, employee_id, email, salary,
department_id, commission_pct from employee e1
where commission_pct = (select min(commission_pct)
from employee e2 where e1.manager_id = e2.manager_id);

```
MariaDB [LAB_2]> select first_name, last_name, employee_id, email, salary,
    -> department_id, commission_pct from employee e1
    -> where commission_pct = (select min(commission_pct)
    -> from employee e2 where e1.manager_id = e2.manager_id);
+------------+------------+-------------+-------------------------------+--------+---------------+----------------+
| first_name | last_name  | employee_id | email                         | salary | department_id | commission_pct |
+------------+------------+-------------+-------------------------------+--------+---------------+----------------+
| Shoaib     | Ahmed      | EMP001      | shoaib.ahmed@bracu.ac.bd      |  50000 | DPT001        |          0.100 |
| Farden     | Khan       | EMP004      | farden.khan@bracu.ac.bd       |  55000 | DPT004        |          0.050 |
| Fakhruddin | Gazzali    | EMP005      | fakhruddin.gazzali@bracu.ac.bd|  70000 | DPT005        |          0.300 |
| Fatiha     | Chowdhury  | EMP007      | fatiha.chowdhury@bracu.ac.bd  |  30000 | DPT007        |          0.250 |
| Farig      | Sadeque    | EMP009      | farig.sadeque@bracu.ac.bd     |  20000 | DPT002        |          0.450 |
| Himaddri   | Roy        | EMP012      | himaddri.roy@bracu.ac.bd      |  60000 | DPT005        |          0.200 |
| Ipshita    | Upoma      | EMP013      | ipshita.upoma@bracu.ac.bd     |  50000 | DPT006        |          0.100 |
| Imam       | Zulkarnain | EMP015      | imam.zulkarnain@bracu.ac.bd   |  55000 | DPT001        |          0.050 |
+------------+------------+-------------+-------------------------------+--------+---------------+----------------+
8 rows in set (0.000 sec)
```