

CSE 370: DATABASE SYSTEMS

ASSIGNMENT-2

Name: Ahmed Rafiun Nur

Student_ID: 24241076

Section: 07

Task-1

create database Company_24241076;

```
MariaDB [(none)]> create database Company_24241076;  
Query OK, 1 row affected (0.001 sec)
```

show databases;

```
MariaDB [(none)]> create database Company_24241076;  
Query OK, 1 row affected (0.001 sec)  
  
MariaDB [(none)]> show databases;  
+-----+  
| Database |  
+-----+  
| company_24241076 |  
| cse370_lab01_sec07 |  
| google_24241076 |  
| information_schema |  
| mysql |  
| performance_schema |  
| phpmyadmin |  
| test |  
+-----+  
8 rows in set (0.019 sec)
```

use Company_24241076;

```
MariaDB [(none)]> use Company_24241076;  
Database changed
```

```
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 Company_24241076;  
Database changed  
MariaDB [Company_24241076]> 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 (0.007 sec)
```

describe Employee;

```
MariaDB [Company_24241076]> 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 (0.012 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', 'John', 'Doe', 'john.doe@example.com', '123-456-7890', '2023-01-15',
'JOB003', 60000, 0.05, 'MNG002', 'DPT002'),
```

```
('EMP002', 'Jane', 'Smith', 'jane.smith@example.com', '234-567-8901', '2023-02-
20', 'JOB002', 55000, 0.03, 'MNG001', 'DPT003'),
```

```
('EMP003', 'Michael', 'Johnson', 'michael.johnson@example.com', '345-678-9012',
'2023-03-10', 'JOB001', 65000, 0.06, 'MNG003', 'DPT001'),
```

```
('EMP004', 'Emily', 'Brown', 'emily.brown@example.com', '456-789-0123', '2024-
08-22', 'JOB004', 70000, 0.04, 'MNG002', 'DPT005'),
```

```
('EMP005', 'David', 'Wilson', 'david.wilson@example.com', '567-890-1234', '2023-
05-12', 'JOB003', 62000, 0.05, 'MNG004', 'DPT004'),
```

```
('EMP006', 'Sarah', 'Martinez', 'sarah.martinez@example.com', '678-901-2345',
'2023-06-18', 'JOB002', 58000, 0.03, 'MNG001', 'DPT006'),
```

('EMP007', 'Christopher', 'Lee', 'christopher.lee@example.com', '789-012-3456', '2023-07-22', 'JOB001', 67000, 0.07, 'MNG003', 'DPT002'),

('EMP008', 'Jessica', 'Garcia', 'jessica.garcia@example.com', '890-123-4567', '2023-08-30', 'JOB004', 72000, 0.04, 'MNG002', 'DPT007'),

('EMP009', 'Daniel', 'Miller', 'daniel.miller@example.com', '901-234-5678', '2023-09-14', 'JOB003', 63000, 0.05, 'MNG004', 'DPT003'),

('EMP010', 'Michelle', 'Lopez', 'michelle.lopez@example.com', '012-345-6789', '2023-10-05', 'JOB002', 30000, 0.03, 'MNG001', 'DPT005'),

('EMP011', 'James', 'Martinez', 'james.martinez@example.com', '123-456-7890', '2023-11-11', 'JOB001', 68000, 0.06, 'MNG003', 'DPT006'),

('EMP012', 'Amanda', 'Young', 'amanda.young@example.com', '234-567-8901', '2023-12-25', 'JOB004', 73000, 0.04, 'MNG002', 'DPT002'),

('EMP013', 'Ryan', 'Harris', 'ryan.harris@example.com', '345-678-9012', '2024-08-22', 'JOB003', 64000, 0.05, 'MNG004', 'DPT004'),

('EMP014', 'Nicole', 'King', 'nicole.king@example.com', '456-789-0123', '2024-02-14', 'JOB002', 60000, 0.02, 'MNG001', 'DPT007'),

('EMP015', 'Matthew', 'Gonzalez', 'matthew.gonzalez@example.com', '567-890-1234', '2024-03-20', 'JOB001', 69000, 0.06, 'MNG003', 'DPT003'),

('EMP016', 'Emily', 'Clark', 'emily.clark@example.com', '678-901-2345', '2024-04-05', 'JOB004', 74000, 0.04, 'MNG002', 'DPT005'),

('EMP017', 'Justin', 'Lewis', 'justin.lewis@example.com', '789-012-3456', '2024-05-15', 'JOB003', 65000, 0.05, 'MNG004', 'DPT006'),

('EMP018', 'Rachel', 'Rodriguez', 'rachel.rodriguez@example.com', '890-123-4567', '2024-06-01', 'JOB002', 61000, 0.03, 'MNG001', 'DPT002'),

('EMP019', 'Brandon', 'Hall', 'brandon.hall@example.com', '901-234-5678', '2024-07-10', 'JOB001', 70000, 0.06, 'MNG003', 'DPT007'),

('EMP020', 'Kayla', 'Perez', 'kayla.perez@example.com', '012-345-6789', '2024-08-22', 'JOB004', 75000, 0.04, 'MNG002', 'DPT004');

```

MariaDB [Company_24241076]> 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', 'John', 'Doe', 'john.doe@example.com', '123-456-7890', '2023-01-15', 'JOB003', 60000, 0.05, 'MNG002', 'DPT002'),
-> ('EMP002', 'Jane', 'Smith', 'jane.smith@example.com', '234-567-8901', '2023-02-20', 'JOB002', 55000, 0.03, 'MNG001', 'DPT003'),
-> ('EMP003', 'Michael', 'Johnson', 'michael.johnson@example.com', '345-678-9012', '2023-03-10', 'JOB001', 65000, 0.06, 'MNG003', 'DPT001'),
-> ('EMP004', 'Emily', 'Brown', 'emily.brown@example.com', '456-789-0123', '2024-08-22', 'JOB004', 70000, 0.04, 'MNG002', 'DPT005'),
-> ('EMP005', 'David', 'Wilson', 'david.wilson@example.com', '567-890-1234', '2023-05-12', 'JOB003', 62000, 0.05, 'MNG004', 'DPT004'),
-> ('EMP006', 'Sarah', 'Martinez', 'sarah.martinez@example.com', '678-901-2345', '2023-06-18', 'JOB002', 58000, 0.03, 'MNG001', 'DPT006'),
-> ('EMP007', 'Christopher', 'Lee', 'christopher.lee@example.com', '789-012-3456', '2023-07-22', 'JOB001', 67000, 0.07, 'MNG003', 'DPT002'),
-> ('EMP008', 'Jessica', 'Garcia', 'jessica.garcia@example.com', '890-123-4567', '2023-08-30', 'JOB004', 72000, 0.04, 'MNG002', 'DPT007'),
-> ('EMP009', 'Daniel', 'Miller', 'daniel.miller@example.com', '901-234-5678', '2023-09-14', 'JOB003', 63000, 0.05, 'MNG004', 'DPT003'),
-> ('EMP010', 'Michelle', 'Lopez', 'michelle.lopez@example.com', '012-345-6789', '2023-10-05', 'JOB002', 30000, 0.03, 'MNG001', 'DPT005'),
-> ('EMP011', 'James', 'Martinez', 'james.martinez@example.com', '123-456-7890', '2023-11-11', 'JOB001', 68000, 0.06, 'MNG003', 'DPT006'),
-> ('EMP012', 'Amanda', 'Young', 'amanda.young@example.com', '234-567-8901', '2023-12-25', 'JOB004', 73000, 0.04, 'MNG002', 'DPT002'),
-> ('EMP013', 'Ryan', 'Harris', 'ryan.harris@example.com', '345-678-9012', '2024-08-22', 'JOB003', 64000, 0.05, 'MNG004', 'DPT004'),
-> ('EMP014', 'Nicole', 'King', 'nicole.king@example.com', '456-789-0123', '2024-02-14', 'JOB002', 60000, 0.02, 'MNG001', 'DPT007'),
-> ('EMP015', 'Matthew', 'Gonzalez', 'matthew.gonzalez@example.com', '567-890-1234', '2024-03-20', 'JOB001', 69000, 0.06, 'MNG003', 'DPT003'),
-> ('EMP016', 'Emily', 'Clark', 'emily.clark@example.com', '678-901-2345', '2024-04-05', 'JOB004', 74000, 0.04, 'MNG002', 'DPT005'),
-> ('EMP017', 'Justin', 'Lewis', 'justin.lewis@example.com', '789-012-3456', '2024-05-15', 'JOB003', 65000, 0.05, 'MNG004', 'DPT006'),
-> ('EMP018', 'Rachel', 'Rodriguez', 'rachel.rodriguez@example.com', '890-123-4567', '2024-06-01', 'JOB002', 61000, 0.03, 'MNG001', 'DPT002'),
-> ('EMP019', 'Brandon', 'Hall', 'brandon.hall@example.com', '901-234-5678', '2024-07-10', 'JOB001', 70000, 0.06, 'MNG003', 'DPT007'),
-> ('EMP020', 'Kayla', 'Perez', 'kayla.perez@example.com', '012-345-6789', '2024-08-22', 'JOB004', 75000, 0.04, 'MNG002', 'DPT004');
Query OK, 20 rows affected (0.030 sec)
Records: 20 Duplicates: 0 Warnings: 0

```

select * from Employee;

```

MariaDB [Company_24241076]> select * from Employee;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| employee_id | first_name | last_name | email | phone_number | hire_date | job_id | salary | commission_pct | manager_id | department_id |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| EMP001 | John | Doe | john.doe@example.com | 123-456-7890 | 2023-01-15 | JOB003 | 60000 | 0.050 | MNG002 | DPT002 |
| EMP002 | Jane | Smith | jane.smith@example.com | 234-567-8901 | 2023-02-20 | JOB002 | 55000 | 0.030 | MNG001 | DPT003 |
| EMP003 | Michael | Johnson | michael.johnson@example.com | 345-678-9012 | 2023-03-10 | JOB001 | 65000 | 0.060 | MNG003 | DPT001 |
| EMP004 | Emily | Brown | emily.brown@example.com | 456-789-0123 | 2024-08-22 | JOB004 | 70000 | 0.040 | MNG002 | DPT005 |
| EMP005 | David | Wilson | david.wilson@example.com | 567-890-1234 | 2023-05-12 | JOB003 | 62000 | 0.050 | MNG004 | DPT004 |
| EMP006 | Sarah | Martinez | sarah.martinez@example.com | 678-901-2345 | 2023-06-18 | JOB002 | 58000 | 0.030 | MNG001 | DPT006 |
| EMP007 | Christopher | Lee | christopher.lee@example.com | 789-012-3456 | 2023-07-22 | JOB001 | 67000 | 0.070 | MNG003 | DPT002 |
| EMP008 | Jessica | Garcia | jessica.garcia@example.com | 890-123-4567 | 2023-08-30 | JOB004 | 72000 | 0.040 | MNG002 | DPT007 |
| EMP009 | Daniel | Miller | daniel.miller@example.com | 901-234-5678 | 2023-09-14 | JOB003 | 63000 | 0.050 | MNG004 | DPT003 |
| EMP010 | Michelle | Lopez | michelle.lopez@example.com | 012-345-6789 | 2023-10-05 | JOB002 | 30000 | 0.030 | MNG001 | DPT005 |
| EMP011 | James | Martinez | james.martinez@example.com | 123-456-7890 | 2023-11-11 | JOB001 | 68000 | 0.060 | MNG003 | DPT006 |
| EMP012 | Amanda | Young | amanda.young@example.com | 234-567-8901 | 2023-12-25 | JOB004 | 73000 | 0.040 | MNG002 | DPT002 |
| EMP013 | Ryan | Harris | ryan.harris@example.com | 345-678-9012 | 2024-08-22 | JOB003 | 64000 | 0.050 | MNG004 | DPT004 |
| EMP014 | Nicole | King | nicole.king@example.com | 456-789-0123 | 2024-02-14 | JOB002 | 60000 | 0.020 | MNG001 | DPT007 |
| EMP015 | Matthew | Gonzalez | matthew.gonzalez@example.com | 567-890-1234 | 2024-03-20 | JOB001 | 69000 | 0.060 | MNG003 | DPT003 |
| EMP016 | Emily | Clark | emily.clark@example.com | 678-901-2345 | 2024-04-05 | JOB004 | 74000 | 0.040 | MNG002 | DPT005 |
| EMP017 | Justin | Lewis | justin.lewis@example.com | 789-012-3456 | 2024-05-15 | JOB003 | 65000 | 0.050 | MNG004 | DPT006 |
| EMP018 | Rachel | Rodriguez | rachel.rodriguez@example.com | 890-123-4567 | 2024-06-01 | JOB002 | 61000 | 0.030 | MNG001 | DPT002 |
| EMP019 | Brandon | Hall | brandon.hall@example.com | 901-234-5678 | 2024-07-10 | JOB001 | 70000 | 0.060 | MNG003 | DPT007 |
| EMP020 | Kayla | Perez | kayla.perez@example.com | 012-345-6789 | 2024-08-22 | JOB004 | 75000 | 0.040 | MNG002 | DPT004 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
20 rows in set (0.001 sec)

```

SELECT first_name, last_name, email, phone_number, hire_date, department_id

FROM Employee

WHERE hire_date = (SELECT MAX(hire_date) FROM Employee);

```

MariaDB [Company_24241076]> 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 |
+-----+-----+-----+-----+-----+-----+
| Emily | Brown | emily.brown@example.com | 456-789-0123 | 2024-08-22 | DPT005 |
| Ryan | Harris | ryan.harris@example.com | 345-678-9012 | 2024-08-22 | DPT004 |
| Kayla | Perez | kayla.perez@example.com | 012-345-6789 | 2024-08-22 | DPT004 |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.001 sec)

```

Task-2

SELECT first_name, last_name, employee_id, phone_number, salary,
department_id

FROM Employee e1

```

WHERE salary = (
    SELECT MIN(salary)
    FROM Employee e2
    WHERE e2.department_id = e1.department_id
);

```

```

MariaDB [Company_24241076]> SELECT first_name, last_name, employee_id, phone_number, salary, department_id
-> FROM Employee e1
-> WHERE salary = (
->     SELECT MIN(salary)
->     FROM Employee e2
->     WHERE e2.department_id = e1.department_id
-> );

```

first_name	last_name	employee_id	phone_number	salary	department_id
John	Doe	EMP001	123-456-7890	60000	DPT002
Jane	Smith	EMP002	234-567-8901	55000	DPT003
Michael	Johnson	EMP003	345-678-9012	65000	DPT001
David	Wilson	EMP005	567-890-1234	62000	DPT004
Sarah	Martinez	EMP006	678-901-2345	58000	DPT006
Michelle	Lopez	EMP010	012-345-6789	30000	DPT005
Nicole	King	EMP014	456-789-0123	60000	DPT007

7 rows in set (0.001 sec)

Task-3

```

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 [Company_24241076]> 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
Nicole	King	EMP014	0.020	DPT007

1 row in set (0.008 sec)

Task-4

```

SELECT department_id, COUNT(*) AS total_number_of_employees
FROM Employee
GROUP BY department_id
HAVING MAX(salary) <= 30000;

```

```

MariaDB [Company_24241076]> SELECT department_id, COUNT(*) AS total_number_of_employees
-> FROM Employee
-> GROUP BY department_id
-> HAVING MAX(salary) <= 30000;
Empty set (0.001 sec)

```

Task-5

```

SELECT DISTINCT e1.department_id, e1.job_id, e1.commission_pct
FROM Employee e1
WHERE EXISTS (
    SELECT 1
    FROM Employee e2
    WHERE e2.department_id = e1.department_id
    AND e2.commission_pct < e1.commission_pct
    AND e2.job_id <> e1.job_id
)

```

);

```
MariaDB [Company_24241076]> SELECT DISTINCT e1.department_id, e1.job_id, e1.commission_pct  
-> FROM Employee e1  
-> WHERE EXISTS (  
->   SELECT 1  
->   FROM Employee e2  
->   WHERE e2.department_id = e1.department_id  
->         AND e2.commission_pct < e1.commission_pct  
->         AND e2.job_id <> e1.job_id  
-> );
```

department_id	job_id	commission_pct
DPT002	JOB001	0.070
DPT003	JOB003	0.050
DPT003	JOB001	0.060
DPT006	JOB001	0.060
DPT006	JOB003	0.050
DPT007	JOB001	0.060
DPT005	JOB004	0.040
DPT002	JOB003	0.050
DPT007	JOB004	0.040
DPT002	JOB004	0.040
DPT004	JOB003	0.050

11 rows in set (0.000 sec)

Task-6

SELECT DISTINCT manager_id

FROM Employee e1

WHERE NOT EXISTS (

SELECT 1

FROM Employee e2

WHERE e2.manager_id = e1.manager_id

AND e2.salary < 3500

);


```

MariaDB [Company_24241076]> SELECT DISTINCT manager_id
-> FROM Employee e1
-> WHERE NOT EXISTS (
->     SELECT 1
->     FROM Employee e2
->     WHERE e2.manager_id = e1.manager_id
->           AND e2.salary < 3500
-> );

```

```

+-----+
| manager_id |
+-----+
| MNG002     |
| MNG001     |
| MNG003     |
| MNG004     |
+-----+
4 rows in set (0.001 sec)

```

Task-7

WITH RankedEmployees AS (

SELECT

first_name, last_name, employee_id, email, salary, department_id,
manager_id, commission_pct,

ROW_NUMBER() OVER (PARTITION BY manager_id ORDER BY
commission_pct) AS rank

FROM Employee

)

SELECT

first_name, last_name, employee_id, email, salary, department_id,
commission_pct

FROM RankedEmployees

WHERE rank = 1;

```

MariaDB [Company_24241076]> WITH RankedEmployees AS (
-> SELECT
-> first_name, last_name, employee_id, email, salary,
-> department_id, manager_id, commission_pct,
-> ROW_NUMBER() OVER (PARTITION BY manager_id ORDER BY
-> commission_pct) AS rank
-> FROM Employee
-> )
-> SELECT
-> first_name, last_name, employee_id, email, salary,
-> department_id, commission_pct
-> FROM RankedEmployees
-> WHERE rank = 1;

```

first_name	last_name	employee_id	email	salary	department_id	commission_pct
Nicole	King	EMP014	nicole.king@example.com	60000	DPT007	0.020
Jessica	Garcia	EMP008	jessica.garcia@example.com	72000	DPT007	0.040
Michael	Johnson	EMP003	michael.johnson@example.com	65000	DPT001	0.060
Daniel	Miller	EMP009	daniel.miller@example.com	63000	DPT003	0.050

4 rows in set (0.001 sec)