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Science and Engineering

Section : 04

Subject : CSE370

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Table Creation and Data Population

```
CREATE TABLE `employees` (  
  `employee_id` char(10) NOT NULL,  
  `first_name` varchar(20) NOT NULL,  
  `last_name` varchar(20) NOT NULL,  
  `email` varchar(60) NOT NULL,  
  `phone_number` char(14) NOT NULL,  
  `hire_date` date NOT NULL,  
  `job_id` int(11) NOT NULL,  
  `salary` int(11) NOT NULL,  
  `commission_pct` decimal(5, 3) NOT NULL,  
  `manager_id` char(10) NOT NULL,  
  `department_id` int(11) NOT NULL  
);
```

```
MariaDB [(none)]> create database HW_03;  
Query OK, 1 row affected (0.001 sec)  
  
MariaDB [(none)]> use HW_03;  
Database changed  
MariaDB [HW_03]> CREATE TABLE `employees` (  
  -> `employee_id` char(10) NOT NULL,  
  -> `first_name` varchar(20) NOT NULL,  
  -> `last_name` varchar(20) NOT NULL,  
  -> `email` varchar(60) NOT NULL,  
  -> `phone_number` char(14) NOT NULL,  
  -> `hire_date` date NOT NULL,  
  -> `job_id` int(11) NOT NULL,  
  -> `salary` int(11) NOT NULL,  
  -> `commission_pct` decimal(5, 3) NOT NULL,  
  -> `manager_id` char(10) NOT NULL,  
  -> `department_id` int(11) NOT NULL  
  -> );  
Query OK, 0 rows affected (0.148 sec)  
  
MariaDB [HW_03]> 
```

```
INSERT INTO `employees` (  
  `employee_id`, `first_name`, `last_name`,  
  `email`, `phone_number`, `hire_date`,  
  `job_id`, `salary`, `commission_pct`,  
  `manager_id`, `department_id`  
)  
VALUES  
(  
  '136', 'Hazel', 'Philtanker', 'hphiltan@gmail.com',  
  '650.127.1634', '2008-02-06', 9,  
  2200, '0.500', '122', 50
```

```
),
(
  '137', 'Renske', 'Ladwig', 'rladwig@gmail.com',
  '650.121.1234', '2003-07-14', 9,
  3600, '0.000', '123', 50
),
(
  '138', 'Stephen', 'Stiles', 'sstiles@gmail.com',
  '650.121.2034', '2005-10-26', 9,
  3200, '0.000', '123', 50
),
(
  '139', 'John', 'Seo', 'jseo@gmail.com',
  '650.121.2019', '2006-02-12', 9,
  2700, '0.000', '123', 50
),
(
  '140', 'Joshua', 'Patel', 'jpatel@gmail.com',
  '650.121.1834', '2006-04-06', 9,
  2500, '0.000', '123', 50
),
(
  '141', 'Trenna', 'Rajs', 'trajs@gmail.com',
  '650.121.8009', '2003-10-17', 9,
  3500, '0.000', '124', 50
),
(
  '142', 'Curtis', 'Davies', 'cdavies@gmail.com',
  '650.121.2994', '2005-01-29', 9,
  3100, '0.000', '124', 50
),
(
  '143', 'Randall', 'Matos', 'rmatos@gmail.com',
  '650.121.2874', '2006-03-15', 9,
  2600, '0.000', '124', 50
),
(
  '144', 'Peter', 'Vargas', 'pvargas@gmail.com',
  '650.121.2004', '2006-07-09', 9,
  2500, '0.000', '124', 50
),
(
  '145', 'John', 'Russell', 'jrussel@gmail.com',
  '011.134292', '2004-10-01', 10, 140000,
  '0.400', '100', 80
),
(
  '146', 'Karen', 'Partners', 'kpartner@gmail.com',
  '011.134668', '2005-01-05', 10, 135000,
  '0.300', '100', 80
),
(
  '147', 'Alberto', 'Errazuriz', 'aerrazur@gmail.com',
```

```

'011.134278', '2005-03-10', 10, 120000,
'0.300', '100', 80
),
(
'148', 'Gerald', 'Cambrault', 'gcambrau@gmail.com',
'011.136268', '2007-10-15', 10, 110000,
'0.300', '100', 80
),
(
'149', 'Eleni', 'Zlotkey', 'ezlotkey@gmail.com',
'011.134218', '2008-01-29', 10, 105000,
'0.200', '100', 80
),
(
'150', 'Peter', 'Tucker', 'ptucker@gmail.com',
'011.131268', '2005-01-30', 11, 100000,
'0.300', '145', 80
),
(
'151', 'David', 'Bernstein', 'dbernste@gmail.com',
'011.133268', '2005-03-24', 11, 95000,
'0.250', '145', 80
),
(
'152', 'Peter', 'Hall', 'phall@gmail.com',
'011.134788', '2005-08-20', 11, 90000,
'0.250', '145', 80
),
(
'153', 'Christopher', 'Olsen', 'colsen@gmail.com',
'011.134718', '2006-03-30', 11, 80000,
'0.200', '145', 80
),
(
'154', 'Nanette', 'Cambrault', 'ncambrau@gmail.com',
'011.139668', '2006-12-09', 11, 75000,
'0.200', '145', 80
),
(
'206', 'William', 'Gietz', 'wgietz@gmail.com',
'515.123.8181', '2002-06-07', 19,
83000, '0.000', '205', 110
);

```

```

MariaDB [HW_03]> INSERT INTO `employees` (
  -> `employee_id`, `first_name`, `last_name`, `email`, `phone_number`, `hire_date`, `job_id`, `salary`, `commission_pct`, `manager_id`, `department_id`
  -> )
  -> VALUES
  -> ('136', 'Hazel', 'Philtanker', 'hphiltan@gmail.com', '650.127.1634', '2008-02-06', 9, 2200, '0.500', '122', 50),
  -> ('137', 'Renske', 'Ladwig', 'rladwig@gmail.com', '650.121.1234', '2003-07-14', 9, 3600, '0.000', '123', 50),
  -> ('138', 'Stephen', 'Stiles', 'sstiles@gmail.com', '650.121.2034', '2005-10-26', 9, 3200, '0.000', '123', 50),
  -> ('139', 'John', 'Seo', 'jseo@gmail.com', '650.121.2019', '2006-02-12', 9, 2700, '0.000', '123', 50),
  -> ('140', 'Joshua', 'Patel', 'jpatel@gmail.com', '650.121.1834', '2006-04-06', 9, 2500, '0.000', '123', 50),
  -> ('141', 'Trenna', 'Rajs', 'trajs@gmail.com', '650.121.8009', '2003-10-17', 9, 3500, '0.000', '124', 50),
  -> ('142', 'Curtis', 'Davies', 'cdavies@gmail.com', '650.121.2994', '2005-01-29', 9, 3100, '0.000', '124', 50),
  -> ('143', 'Randall', 'Matos', 'rmatos@gmail.com', '650.121.2874', '2006-03-15', 9, 2600, '0.000', '124', 50),
  -> ('144', 'Peter', 'Vargas', 'pvargas@gmail.com', '650.121.2004', '2006-07-09', 9, 2500, '0.000', '124', 50),
  -> ('145', 'John', 'Russell', 'jrusse@gmail.com', '011.134292', '2004-10-01', 10, 140000, '0.400', '100', 80),
  -> ('146', 'Karen', 'Partners', 'kpartner@gmail.com', '011.134668', '2005-01-05', 10, 135000, '0.300', '100', 80),
  -> ('147', 'Alberto', 'Errazuriz', 'aerrazur@gmail.com', '011.134278', '2005-03-10', 10, 120000, '0.300', '100', 80),
  -> ('148', 'Gerald', 'Cambraut', 'gcambrau@gmail.com', '011.136268', '2007-10-15', 10, 110000, '0.300', '100', 80),
  -> ('149', 'Eleni', 'Zlotkey', 'ezlotkey@gmail.com', '011.134218', '2008-01-29', 10, 105000, '0.200', '100', 80),
  -> ('150', 'Peter', 'Tucker', 'ptucker@gmail.com', '011.131268', '2005-01-30', 11, 100000, '0.300', '145', 80),
  -> ('151', 'David', 'Bernstein', 'dbernste@gmail.com', '011.133268', '2005-03-24', 11, 95000, '0.250', '145', 80),
  -> ('152', 'Peter', 'Hall', 'phall@gmail.com', '011.134788', '2005-08-20', 11, 90000, '0.250', '145', 80),
  -> ('153', 'Christopher', 'Olsen', 'colsen@gmail.com', '011.134718', '2006-03-30', 11, 80000, '0.200', '145', 80),
  -> ('154', 'Nanette', 'Cambraut', 'ncambrau@gmail.com', '011.139668', '2006-12-09', 11, 75000, '0.200', '145', 80),
  -> ('206', 'William', 'Gietz', 'wgietz@gmail.com', '515.123.8181', '2002-06-07', 19, 83000, '0.000', '205', 110);
Query OK, 20 rows affected (0.030 sec)
Records: 20 Duplicates: 0 Warnings: 0

MariaDB [HW_03]>

```

```
select * from `employees`;
```

```

MariaDB [HW_03]> select * from `employees`;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| employee_id | first_name | last_name | email | phone_number | hire_date | job_id | salary | commission_pct | manager_id | department_id |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 136 | Hazel | Philtanker | hphiltan@gmail.com | 650.127.1634 | 2008-02-06 | 9 | 2200 | 0.500 | 122 | 50 |
| 137 | Renske | Ladwig | rladwig@gmail.com | 650.121.1234 | 2003-07-14 | 9 | 3600 | 0.000 | 123 | 50 |
| 138 | Stephen | Stiles | sstiles@gmail.com | 650.121.2034 | 2005-10-26 | 9 | 3200 | 0.000 | 123 | 50 |
| 139 | John | Seo | jseo@gmail.com | 650.121.2019 | 2006-02-12 | 9 | 2700 | 0.000 | 123 | 50 |
| 140 | Joshua | Patel | jpatel@gmail.com | 650.121.1834 | 2006-04-06 | 9 | 2500 | 0.000 | 123 | 50 |
| 141 | Trenna | Rajs | trajs@gmail.com | 650.121.8009 | 2003-10-17 | 9 | 3500 | 0.000 | 124 | 50 |
| 142 | Curtis | Davies | cdavies@gmail.com | 650.121.2994 | 2005-01-29 | 9 | 3100 | 0.000 | 124 | 50 |
| 143 | Randall | Matos | rmatos@gmail.com | 650.121.2874 | 2006-03-15 | 9 | 2600 | 0.000 | 124 | 50 |
| 144 | Peter | Vargas | pvargas@gmail.com | 650.121.2004 | 2006-07-09 | 9 | 2500 | 0.000 | 124 | 50 |
| 145 | John | Russell | jrusse@gmail.com | 011.134292 | 2004-10-01 | 10 | 140000 | 0.400 | 100 | 80 |
| 146 | Karen | Partners | kpartner@gmail.com | 011.134668 | 2005-01-05 | 10 | 135000 | 0.300 | 100 | 80 |
| 147 | Alberto | Errazuriz | aerrazur@gmail.com | 011.134278 | 2005-03-10 | 10 | 120000 | 0.300 | 100 | 80 |
| 148 | Gerald | Cambraut | gcambrau@gmail.com | 011.136268 | 2007-10-15 | 10 | 110000 | 0.300 | 100 | 80 |
| 149 | Eleni | Zlotkey | ezlotkey@gmail.com | 011.134218 | 2008-01-29 | 10 | 105000 | 0.200 | 100 | 80 |
| 150 | Peter | Tucker | ptucker@gmail.com | 011.131268 | 2005-01-30 | 11 | 100000 | 0.300 | 145 | 80 |
| 151 | David | Bernstein | dbernste@gmail.com | 011.133268 | 2005-03-24 | 11 | 95000 | 0.250 | 145 | 80 |
| 152 | Peter | Hall | phall@gmail.com | 011.134788 | 2005-08-20 | 11 | 90000 | 0.250 | 145 | 80 |
| 153 | Christopher | Olsen | colsen@gmail.com | 011.134718 | 2006-03-30 | 11 | 80000 | 0.200 | 145 | 80 |
| 154 | Nanette | Cambraut | ncambrau@gmail.com | 011.139668 | 2006-12-09 | 11 | 75000 | 0.200 | 145 | 80 |
| 206 | William | Gietz | wgietz@gmail.com | 515.123.8181 | 2002-06-07 | 19 | 83000 | 0.000 | 205 | 110 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
20 rows in set (0.001 sec)

MariaDB [HW_03]>

```

good to go...

Download the `sql` file from [here](#)

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
  `employees`
where
  `hire_date` =(
    select
      max(`hire_date`)
    from
      `employees`
  );
```

```
MariaDB [HW_03]> 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 |
+-----+-----+-----+-----+-----+-----+
| Hazel      | Philtanker | hphiltan@gmail.com   | 650.127.1634 | 2008-02-06 | 50            |
+-----+-----+-----+-----+-----+-----+
1 row in set (0.001 sec)

MariaDB [HW_03]> 
```

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
  `employees` e1
where
  e1.`salary` <= all(
    select
      `salary`
    from
      `employees` e2
    where
      e1.`department_id` = e2.`department_id`
      and e1.`employee_id` != e2.`employee_id`
  );
```

```
MariaDB [HW_03]> select
->  `first_name`, `last_name`, `employee_id`, `phone_number`, `salary`, `department_id`
->  from
->  `employees` e1
->  where
->  e1.`salary` <= all(
->    select
->      `salary`
->    from
->      `employees` e2
->    where
->      e1.`department_id` = e2.`department_id`
->      and e1.`employee_id` != e2.`employee_id`
->  );
```

first_name	last_name	employee_id	phone_number	salary	department_id
Hazel	Philtanker	136	650.127.1634	2200	50
Nanette	Cambrault	154	011.139668	75000	80
William	Gietz	206	515.123.8181	83000	110

3 rows in set (0.001 sec)

```
MariaDB [HW_03]> 
```

3. Find the `first_name`, `last_name`, `employee_id`, `commission_pct` and `department_id` of all the employees in department XYZABC (`department_id` = 7) who have a lower `commission_pct` than all of the employees of department ABCXYZ(`department_id` = 5).

```
select
  `first_name`, `last_name`, `employee_id`, `commission_pct`, `department_id`
from
  `employees`
where
  `department_id` = 50
  and `commission_pct` < all(
    select
      `commission_pct`
    from
      `employees`
    where
      `department_id` = 80
  );
```

```
MariaDB [HW_03]> select
->  `first_name`, `last_name`, `employee_id`, `commission_pct`, `department_id`
->  from
->  `employees`
->  where
->  `department_id` = 50
->  and `commission_pct` < all(
->    select
->    `commission_pct`
->    from
->    `employees`
->    where
->    `department_id` = 80
->  );
```

first_name	last_name	employee_id	commission_pct	department_id
Renske	Ladwig	137	0.000	50
Stephen	Stiles	138	0.000	50
John	Seo	139	0.000	50
Joshua	Patel	140	0.000	50
Trenna	Rajs	141	0.000	50
Curtis	Davies	142	0.000	50
Randall	Matos	143	0.000	50
Peter	Vargas	144	0.000	50

8 rows in set (0.001 sec)

MariaDB [HW_03]>

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
  count(*) as total_employees,
  `department_id`
from
  `employees` e1
where
  not exists (
    select
      *
    from
      `employees` e2
    where
      e1.`department_id` = e2.`department_id`
      and e2.`salary` >= 30000
  )
group by
  `department_id`;
```

```
MariaDB [HW_03]> select
  ->   count(*) as total_employees,
  ->   `department_id`
  -> from
  ->   `employees` e1
  -> where
  ->   not exists (
  ->     select
  ->       *
  ->     from
  ->       `employees` e2
  ->     where
  ->       e1.`department_id` = e2.`department_id`
  ->       and e2.`salary` >= 30000
  ->   )
  -> group by
  ->   `department_id`;
```

```
+-----+-----+
| total_employees | department_id |
+-----+-----+
|          9    |          50   |
+-----+-----+
```

1 row in set (0.000 sec)

MariaDB [HW_03]>

5. For each of the departments, 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
  `employees` e1
where
  exists (
    select
      *
    from
      `employees` e2
    where
      e1.`department_id` = e2.`department_id`
      and e1.`employee_id` != e2.`employee_id`
      and e1.`job_id` != e2.`job_id`
      and e1.`commission_pct` < e2.`commission_pct`
  );
```

```
MariaDB [HW_03]> select
  -> `department_id`,
  -> `job_id`,
  -> `commission_pct`
  -> from
  -> `employees` e1
  -> where
  -> exists (
  ->   select
  ->     *
  ->   from
  ->     `employees` e2
  ->   where
  ->     e1.`department_id` = e2.`department_id`
  ->     and e1.`employee_id` != e2.`employee_id`
  ->     and e1.`job_id` != e2.`job_id`
  ->     and e1.`commission_pct` < e2.`commission_pct`
  ->   );
```

department_id	job_id	commission_pct
80	11	0.300
80	11	0.250
80	11	0.250
80	11	0.200
80	11	0.200
80	10	0.200

6 rows in set (0.000 sec)

```
MariaDB [HW_03]> 
```

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

```
select
  distinct(`manager_id`)
from
  `employees` e1
where
  not exists (
    select
      *
    from
      `employees` e2
    where
      e1.`manager_id` = e2.`manager_id`
      and e2.`salary` < 3500
  );
```

```
MariaDB [HW_03]> select
->   distinct(`manager_id`)
-> from
->   `employees` e1
-> where
->   not exists (
->     select
->       *
->     from
->       `employees` e2
->     where
->       e1.`manager_id` = e2.`manager_id`
->       and e2.`salary` < 3500
->   );
```

```
+-----+
| manager_id |
+-----+
| 100        |
| 145        |
| 205        |
+-----+
```

3 rows in set (0.001 sec)

```
MariaDB [HW_03]> 
```

7. Find the `first_name`, `last_name`, `employee_id`, `email`, `salary`, `department_id` and `commission_pct` of the employee who has the lowest `commission_pct` under each manager.

```
select
  `first_name`, `last_name`, `employee_id`, `email`, `salary`, `department_id`,
  `commission_pct`
from
  `employees` e1
where
  e1.`commission_pct` <= all(
    select
      `commission_pct`
    from
      `employees` e2
    where
      e1.`manager_id` = e2.`manager_id`
      and e1.`employee_id` != e2.`employee_id`
  );
```

```
MariaDB [HW_03]> select
->  `first_name`, `last_name`, `employee_id`, `email`, `salary`, `department_id`, `commission_pct`
->  from
->  `employees` e1
->  where
->  e1.`commission_pct` <= all(
->    select
->    `commission_pct`
->    from
->    `employees` e2
->    where
->    e1.`manager_id` = e2.`manager_id`
->    and e1.`employee_id` != e2.`employee_id`
->  );
```

first_name	last_name	employee_id	email	salary	department_id	commission_pct
Hazel	Philtanker	136	hphiltan@gmail.com	2200	50	0.500
Renske	Ladwig	137	rladwig@gmail.com	3600	50	0.000
Stephen	Stiles	138	sstiles@gmail.com	3200	50	0.000
John	Seo	139	jseo@gmail.com	2700	50	0.000
Joshua	Patel	140	jpatel@gmail.com	2500	50	0.000
Trenna	Rajs	141	trajs@gmail.com	3500	50	0.000
Curtis	Davies	142	cdavies@gmail.com	3100	50	0.000
Randall	Matos	143	rmatos@gmail.com	2600	50	0.000
Peter	Vargas	144	pvargas@gmail.com	2500	50	0.000
Eleni	Zlotkey	149	ezlotkey@gmail.com	105000	80	0.200
Christopher	Olsen	153	colsen@gmail.com	80000	80	0.200
Nanette	Cambrault	154	ncambrau@gmail.com	75000	80	0.200
William	Gietz	206	wgietz@gmail.com	83000	110	0.000

```
13 rows in set (0.002 sec)

MariaDB [HW_03]> 
```