Viikko 2: Avaimet ja liitokset

5. Employees, osa 1

a) Minkä nimisiä osastoja (Departments) Employees-tietokannassa on ?

```
mysql>
mysql> SELECT dept_name FROM departments;
+--------------------+
| dept_name          |
+--------------------+
| Customer Service   |
| Development        |
| Finance            |
| Human Resources    |
| Marketing          |
| Production         |
| Quality Management |
| Research           |
| Sales              |
+--------------------+
9 rows in set (0.00 sec)

mysql>
```

b) Tulosta, (yhden kerran kukin) mitä nimikkeitä (title) tietokannassa on.

```
mysql>
mysql> SELECT DISTINCT title FROM titles;
+--------------------+
| title              |
+--------------------+
| Senior Engineer    |
| Staff              |
| Engineer           |
| Senior Staff       |
| Assistant Engineer |
| Technique Leader   |
| Manager            |
+--------------------+
7 rows in set (0.41 sec)

mysql>
```

c) Mikä on suurin ja pienin palkka (salary) ? VIHJE: MIN, MAX

```
mysql> SELECT MAX(salary) FROM salaries;
+-------------+
| MAX(salary) |
+-------------+
|      158220 |
+-------------+
1 row in set (1.07 sec)

mysql> SELECT MIN(salary) FROM salaries;
+-------------+
| MIN(salary) |
+-------------+
|       38623 |
+-------------+
1 row in set (1.25 sec)

mysql>
```

d) Mikä on keskimääräinen palkka ? VIHJE: AVG

```
mysql> SELECT AVG(salary) FROM salaries;
+-------------+
| AVG(salary) |
+-------------+
|  63810.7448 |
+-------------+
1 row in set (1.27 sec)

mysql>
```

e) Tulosta kaikki työntekijät, joiden sukunimi on Facello.

```
mysql> SELECT * FROM employees WHERE last_name LIKE "Facello";
+--------+------------+------------+-----------+--------+------------+
| emp_no | birth_date | first_name | last_name | gender | hire_date  |
+--------+------------+------------+-----------+--------+------------+
|  10001 | 1953-09-02 | Georgi     | Facello   | M      | 1986-06-26 |
|  10327 | 1954-04-01 | Roded      | Facello   | M      | 1987-09-18 |
|  12751 | 1964-07-06 | Nahum      | Facello   | M      | 1995-01-09 |
|  15346 | 1959-09-26 | Kirk       | Facello   | F      | 1991-12-07 |
|  15685 | 1958-07-12 | Kasturi    | Facello   | M      | 1992-03-13 |
|  18686 | 1962-02-23 | Kwangyoen  | Facello   | F      | 1985-05-02 |
|  19041 | 1957-05-29 | Billur     | Facello   | F      | 1992-08-03 |
|  21947 | 1954-06-18 | Taisook    | Facello   | F      | 1991-07-30 |
|  23938 | 1955-07-11 | Nahum      | Facello   | M      | 1985-09-15 |
|  24774 | 1956-09-23 | Uno        | Facello   | F      | 1989-11-09 |
|  24806 | 1959-09-30 | Charmane   | Facello   | F      | 1989-03-17 |
```

f) Kuinka moni työntekijä on syntynyt 1950-luvulla ?

```
1 row in set (0.13 sec)

mysql> SELECT COUNT(*) FROM employees WHERE birth_date<'1960-01-01' AND birth_date>'1949-12-31';
+----------+
| COUNT(*) |
+----------+
|   182886 |
+----------+
1 row in set (0.13 sec)
```

g) Montako miestä ja montako naista työntekijöissä on ?

```
mysql> SELECT COUNT(*) FROM employees WHERE birth_date<'1960-01-01' AND birth_date>'1949-12-31' AND gender='M';
+----------+
| COUNT(*) |
+----------+
|   109732 |
+----------+
1 row in set (0.16 sec)

mysql> SELECT COUNT(*) FROM employees WHERE birth_date<'1960-01-01' AND birth_date>'1949-12-31' AND gender='F';
+----------+
| COUNT(*) |
+----------+
|    73154 |
+----------+
1 row in set (0.16 sec)
```

6: Pet ja owner

```
mysql> ALTER TABLE pet DROP COLUMN owner;
Query OK, 0 rows affected (0.04 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> ALTER TABLE pet ADD COLUMN petID INT PRIMARY KEY AUTO_INCREMENT;
Query OK, 0 rows affected (0.12 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> ALTER TABLE pet ADD COLUMN ownerID INT;
Query OK, 0 rows affected (0.10 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> ALTER TABLE pet ADD CONSTRAINT FOREIGN KEY(ownerID) REFERENCES
    -> owner(ownerID);
Query OK, 8 rows affected (0.09 sec)
Records: 8  Duplicates: 0  Warnings: 0
```

```
mysql>  INSERT INTO owner VALUES ( 'Harold','Lloyd','Someaddress 1',NULL);
Query OK, 1 row affected (0.01 sec)

mysql>  INSERT INTO owner VALUES ( 'Gwen','Stefani','Someaddress 2',NULL);
Query OK, 1 row affected (0.01 sec)

mysql>  INSERT INTO owner VALUES ( 'Benny','Hill','Someaddress 3',NULL);
Query OK, 1 row affected (0.01 sec)

mysql>  INSERT INTO owner VALUES ( 'Diane','Keaton','Someaddress 4',NULL);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO pet VALUES ('Slim','snake','m','1996-04-
    '> 29',NULL,NULL,NULL);
ERROR 1292 (22007): Incorrect date value: '1996-04-
29' for column 'birth' at row 1
mysql> INSERT INTO pet VALUES ('Slim','snake','m','1996-04-29',NULL,NULL,NULL);
Query OK, 1 row affected (0.01 sec)

mysql>
```

```
+----------+--------+------+-----------+-----------+-------+----
9 rows in set (0.00 sec)

mysql> UPDATE pet SET ownerID=3 WHERE name='Claws';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> UPDATE pet SET ownerID=1 WHERE name='Buffy';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> UPDATE pet SET ownerID=4 WHERE name='Fang';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
mysql>  UPDATE pet SET ownerID=2 WHERE name='Bowser';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
mysql> UPDATE pet SET ownerID=3 WHERE name='Chirpy' OR name='Whistler';
Query OK, 2 rows affected (0.01 sec)
Rows matched: 2  Changed: 2  Warnings: 0
```

```
mysql> UPDATE pet SET ownerID=4 WHERE name='Slim';
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
mysql>
mysql> select * from pet;
+----------+---------+------+------------+------------+-------+---------+
| name     | species | sex  | birth      | death      | petID | ownerID |
+----------+---------+------+------------+------------+-------+---------+
| Fluffy   | cat     | f    | 1993-02-04 | NULL       |     1 |       1 |
| Claws    | cat     | m    | 1994-03-17 | NULL       |     2 |       3 |
| Buffy    | dog     | f    | 1989-05-13 | NULL       |     3 |       1 |
| Fang     | dog     | m    | 1990-08-27 | NULL       |     4 |       4 |
| Bowser   | dog     | m    | 1989-08-31 | 1995-07-29 |     5 |       2 |
| Chirpy   | bird    | f    | 1998-09-11 | 2000-08-31 |     6 |       3 |
| Whistler | bird    | NULL | 1997-12-09 | NULL       |     7 |       3 |
| Slim     | snake   | m    | 1996-04-29 | NULL       |     8 |       4 |
+----------+---------+------+------------+------------+-------+---------+
8 rows in set (0.00 sec)

mysql>
```

```
mysql> DESC pet;
+---------+-------------+------+-----+---------+----------------+
| Field   | Type        | Null | Key | Default | Extra          |
+---------+-------------+------+-----+---------+----------------+
| name    | varchar(20) | YES  |     | NULL    |                |
| species | varchar(20) | YES  |     | NULL    |                |
| sex     | char(1)     | YES  |     | NULL    |                |
| birth   | date        | YES  |     | NULL    |                |
| death   | date        | YES  |     | NULL    |                |
| petID   | int         | NO   | PRI | NULL    | auto_increment |
| ownerID | int         | YES  | MUL | NULL    |                |
+---------+-------------+------+-----+---------+----------------+
7 rows in set (0.00 sec)
```

Employees osa 2

a) Tulosta kymmenen aakkosjärjestyksessä ensimmäisen työntekijän tiedot sukunimen mukaan lajiteltuna. Vihje: LIMIT rajoittaa tulostettavien tietojen määrän.

```
mysql>
mysql>
mysql> SELECT * FROM  employees ORDER BY last_name ASC LIMIT 10;
+--------+------------+------------+-----------+--------+------------+
| emp_no | birth_date | first_name | last_name | gender | hire_date  |
+--------+------------+------------+-----------+--------+------------+
|  11761 | 1964-07-17 | Bartek     | Aamodt    | M      | 1991-06-12 |
|  15427 | 1959-03-06 | Aluzio     | Aamodt    | M      | 1985-03-03 |
|  18182 | 1963-02-23 | Dekang     | Aamodt    | F      | 1988-05-25 |
|  16572 | 1956-11-26 | Matt       | Aamodt    | M      | 1987-06-16 |
|  12791 | 1960-06-16 | Mokhtar    | Aamodt    | M      | 1994-08-14 |
|  12516 | 1958-06-25 | Sreenivas  | Aamodt    | F      | 1990-03-06 |
|  12982 | 1952-12-08 | Sachem     | Aamodt    | F      | 1992-01-11 |
|  17400 | 1962-03-22 | Basim      | Aamodt    | F      | 1991-09-15 |
|  19898 | 1957-03-09 | Vidar      | Aamodt    | M      | 1988-08-06 |
|  17885 | 1954-02-01 | Takanari   | Aamodt    | M      | 1996-08-19 |
+--------+------------+------------+-----------+--------+------------+
10 rows in set (0.30 sec)

mysql>
```

b) Sama kuten edellä, mutta sukunimen JA etunimen mukaan lajiteltuna.

```
mysql>
mysql>
mysql> SELECT * FROM  employees ORDER BY last_name ASC, first_name ASC LIMIT 10;
+--------+------------+------------+-----------+--------+------------+
| emp_no | birth_date | first_name | last_name | gender | hire_date  |
+--------+------------+------------+-----------+--------+------------+
| 258641 | 1961-05-23 | Abdelkader | Aamodt    | M      | 1994-12-02 |
| 258005 | 1953-02-17 | Adhemar    | Aamodt    | F      | 1991-01-21 |
| 455773 | 1960-05-04 | Aemilian   | Aamodt    | M      | 1988-04-21 |
| 436560 | 1959-03-16 | Alagu      | Aamodt    | F      | 1991-10-17 |
| 266651 | 1959-05-28 | Aleksander | Aamodt    | F      | 1989-03-29 |
| 487598 | 1962-03-03 | Alexius    | Aamodt    | M      | 1994-12-30 |
| 216963 | 1960-07-16 | Alois      | Aamodt    | M      | 1995-08-24 |
|  15427 | 1959-03-06 | Aluzio     | Aamodt    | M      | 1985-03-03 |
| 100860 | 1964-06-20 | Amabile    | Aamodt    | F      | 1993-02-06 |
| 107070 | 1954-04-24 | Anestis    | Aamodt    | M      | 1990-10-30 |
+--------+------------+------------+-----------+--------+------------+
10 rows in set (0.35 sec)

mysql>
```

c) Tulosta viiden viimeksi palkatun työntekijän tiedot.

```
mysql>
mysql> SELECT * FROM  employees ORDER BY hire_date DESC LIMIT 5;
+--------+------------+------------+-----------+--------+------------+
| emp_no | birth_date | first_name | last_name | gender | hire_date  |
+--------+------------+------------+-----------+--------+------------+
| 463807 | 1964-06-12 | Bikash     | Covnot    | M      | 2000-01-28 |
| 428377 | 1957-05-09 | Yucai      | Gerlach   | M      | 2000-01-23 |
| 499553 | 1954-05-06 | Hideyuki   | Delgrande | F      | 2000-01-22 |
| 222965 | 1959-08-07 | Volkmar    | Perko     | F      | 2000-01-13 |
|  47291 | 1960-09-09 | Ulf        | Flexer    | M      | 2000-01-12 |
+--------+------------+------------+-----------+--------+------------+
5 rows in set (0.24 sec)

mysql>
```

Seuraavissa tehtävissä tarvitaan tietoja useammasta kuin yhdestä taulusta (JOIN).

d) Kenellä on suurin palkka ? Tulosta etunimi, sukunimi ja palkka.

```
mysql>
mysql> SELECT first_name,last_name,salary
    ->     FROM employees
    ->     JOIN salaries ON employees.emp_no=salaries.emp_no
    ->     WHERE salary=(
    ->     SELECT MAX(salary) FROM salaries
    ->     );
+------------+-----------+--------+
| first_name | last_name | salary |
+------------+-----------+--------+
| Tokuyasu   | Pesch     | 158220 |
+------------+-----------+--------+
1 row in set (2.52 sec)

mysql>
```

e) Kenellä on pienin palkka ? Tulosta etunimi, sukunimi ja palkka.

SELECT first_name,last_name,salary FROM employees e JOIN salaries s ON e.emp_no=s.emp_no WHERE s.salary=(SELECT MIN(salary) FROM salaries);

```
mysql>
mysql>
mysql> SELECT first_name,last_name,salary FROM employees e JOIN salaries s ON e.emp_no=s.emp_no WHERE s.salary=(SELECT MIN(salary) FR
OM salaries);
+------------+-----------+--------+
| first_name | last_name | salary |
+------------+-----------+--------+
| Olivera    | Baek      |  38623 |
+------------+-----------+--------+
1 row in set (2.40 sec)

mysql>
```

f) Tulosta työntekijät (etunimi, sukunimi, palkka), jotka ansaitsevat yli 150000.

SELECT first_name,last_name,salary FROM employees e JOIN salaries s ON e.emp_no=s.emp_no WHERE s.salary<150000

g) Kuinka monta työntekijää työskentelee myynnissä (Sales) ? Entä markkinoinnissa (Marketing) ? Voi tehdä joko yhden kyselyn (AND) tai kaksi erillistä.

```
mysql>
mysql>
mysql> SELECT dept_name,COUNT(*) AS Lukumaara FROM departments
    -> JOIN dept_emp ON departments.dept_no=dept_emp.dept_no
    -> JOIN employees ON employees.emp_no=dept_emp.emp_no
    -> WHERE dept_name='Sales'
    -> ;
+-----------+-----------+
| dept_name | Lukumaara |
+-----------+-----------+
| Sales     |     52245 |
+-----------+-----------+
1 row in set (0.48 sec)

mysql>
```

```
mysql>
mysql> SELECT dept_name,COUNT(*) AS Lukumaara FROM departments
    -> JOIN dept_emp ON departments.dept_no=dept_emp.dept_no
    -> JOIN employees ON employees.emp_no=dept_emp.emp_no
    -> AND dept_name='Marketing';
+-----------+-----------+
| dept_name | Lukumaara |
+-----------+-----------+
| Marketing |     20211 |
+-----------+-----------+
1 row in set (0.28 sec)

mysql>
```

h) Tulosta kaikkien osastonjohtajien (Department Managers) etunimi, sukunimi ja osasto, jolla työskentelee.

```
mysql>
mysql> SELECT first_name,last_name,dept_name
    -> FROM  dept_manager dm
    -> JOIN departments d ON dm.dept_no=d.dept_no
    -> JOIN employees e ON dm.emp_no=e.emp_no;
+------------+--------------+--------------------+
| first_name | last_name    | dept_name          |
+------------+--------------+--------------------+
| Tonny      | Butterworth  | Customer Service   |
| Marjo      | Giarratana   | Customer Service   |
| Xiaobin    | Spinelli     | Customer Service   |
| Yuchang    | Weedman      | Customer Service   |
| DeForest   | Hagimont     | Development        |
| Leon       | DasSarma     | Development        |
| Ebru       | Alpin        | Finance            |
| Isamu      | Legleitner   | Finance            |
| Shirish    | Ossenbruggen | Human Resources    |
| Karsten    | Sigstam      | Human Resources    |
| Margareta  | Markovitch   | Marketing          |
| Vishwani   | Minakawa     | Marketing          |
| Krassimir  | Wegerle      | Production         |
| Rosine     | Cools        | Production         |
| Shem       | Kieras       | Production         |
| Oscar      | Ghazalie     | Production         |
| Peternela  | Onuegbe      | Quality Management |
| Rutger     | Hofmeyr      | Quality Management |
| Sanjoy     | Quadeer      | Quality Management |
| Dung       | Pesch        | Quality Management |
| Arie       | Staelin      | Research           |
| Hilary     | Kambil       | Research           |
| Przemyslawa | Kaelbling   | Sales              |
| Hauke      | Zhang        | Sales              |
+------------+--------------+--------------------+
```

i) Mikä on myynnissä työskentelevien keskipalkka ? Entä markkinoinnissa ? Tässäkin voi tehdä joko yhden kyselyn (AND) tai kaksi erillistä.

```
mysql> SELECT dept_name,AVG(salary) AS AVG_SALARY
    -> FROM salaries s
    -> JOIN employees e ON s.emp_no=e.emp_no
    -> JOIN dept_emp de ON e.emp_no=de.emp_no
    -> JOIN departments d ON de.dept_no=d.dept_no
    -> WHERE dept_name='Sales';
+-----------+------------+
| dept_name | AVG_SALARY |
+-----------+------------+
| Sales     | 80667.6058 |
+-----------+------------+
1 row in set (1.78 sec)
```

```
ysql>
ysql>
ysql> SELECT dept_name,AVG(salary) AS AVG_SALARY
    -> FROM salaries s
    -> JOIN employees e ON s.emp_no=e.emp_no
    -> JOIN dept_emp de ON e.emp_no=de.emp_no
    -> JOIN departments d ON de.dept_no=d.dept_no
    -> WHERE dept_name='Marketing';
+-----------+------------+
| dept_name | AVG_SALARY |
+-----------+------------+
| Marketing | 71913.2000 |
+-----------+------------+
1 row in set (1.01 sec)

ysql>
```

8: Sakila

a) Tulosta DVD-elokuvien kielet (language) aakkosjärjestyksessä

```
mysql>
mysql> SELECT name FROM language ORDER BY name ASC;
+----------+
| name     |
+----------+
| English  |
| French   |
| German   |
| Italian  |
| Japanese |
| Mandarin |
+----------+
6 rows in set (0.00 sec)
```

b) Tulosta kaikkien niiden näyttelijöiden elokuvat, joiden sukunimi on Temple.

SELECT title,last_name FROM film

JOIN film_actor ON film.film_id=film_actor.film_id

JOIN actor ON actor.actor_id=film_actor.actor_id

WHERE last_name='Temple';

c) Tulosta elokuvassa "Ghost Groundhog" näytelleet näyttelijät.

```
mysql>
mysql> SELECT first_name,last_name FROM film
    -> JOIN film_actor ON film.film_id=film_actor.film_id
    -> JOIN actor ON actor.actor_id=film_actor.actor_id
    -> WHERE title='Ghost Groundhog';
+------------+-----------+
| first_name | last_name |
+------------+-----------+
| DAN        | HARRIS    |
| KENNETH    | TORN      |
| KEVIN      | GARLAND   |
| RUSSELL    | TEMPLE    |
| RENEE      | BALL      |
+------------+-----------+
5 rows in set (0.01 sec)
```

d) Montako kauhuelokuvaa ("Horror") tietokannassa on ?

```
ysql>
ysql>
ysql> SELECT name,COUNT(*) AS HORROR_MOVIES_NO FROM category
   -> JOIN film_category ON film_category.category_id=category.category_id
   -> WHERE name='Horror';
--------+-----------------+
 name   | HORROR_MOVIES_NO |
--------+-----------------+
 Horror |              56 |
--------+-----------------+
 row in set (0.00 sec)

ysql>
```

e) Tulosta kaikki kauhuelokuvat.

SELECT title FROM category

JOIN film_category ON film_category.category_id=category.category_id

```
JOIN film ON film_category.film_id=film.film_id

WHERE name='Horror';
```