

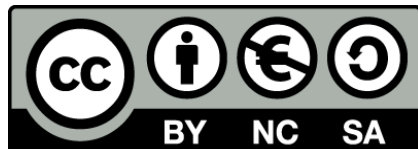


Πανεπιστήμιο Δυτικής Αττικής

Βάσεις Δεδομένων Μεταπτυχιακού Κύκλου Σπουδών (MSCICT101)

Ενότητα 4: Ερωτήματα σε γλώσσα SQL

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Το περιεχόμενο του μαθήματος
διατίθεται με άδεια Creative
Commons εκτός και αν αναφέρεται
διαφορετικά



Πίνακες στους οποίους θα δοκιμάσουμε τις δηλώσεις SELECT

Στήλες του Πίνακα emp:

- Empno-κωδικός υπαλλήλου,
- ename-όνομα υπαλλήλου,
- job-θέση υπαλλήλου,
- mgr-ο επικεφαλής του υπαλλήλου,
- hiredate-ημερομηνία πρόσληψης,
- sal-μισθός,
- comm-προμήθεια,
- deptno-κωδικός τμήματος στο οποίο εργάζεται ο υπάλληλος

Στήλες του Πίνακα dept:

Deptno-κωδικός τμήματος,
dname-όνομα τμήματος,
loc-έδρα τμήματος

Εντολές δημιουργίας Βάσης και Πινάκων

```
DROP DATABASE IF EXISTS personnel;
```

```
CREATE DATABASE personnel;
```

```
USE personnel;
```

```
CREATE TABLE DEPT(DEPTNO INT(2) NOT NULL,  
                   DNAME VARCHAR(14), LOC VARCHAR(14),  
                   PRIMARY KEY(DEPTNO));
```

```
CREATE TABLE EMP(EMPNO INT(4) NOT NULL,  
                  ENAME VARCHAR(10), JOB VARCHAR(9),  
                  MGR INT(4), HIREDATE DATE,  
                  SAL FLOAT(7,2), COMM FLOAT(7,2),  
                  DEPTNO INT(2),  
                  PRIMARY KEY(EMPNO),  
                  FOREIGN KEY(DEPTNO) REFERENCES DEPT(DEPTNO));
```

Εισαγωγή Στοιχείων (dept)

```
INSERT INTO DEPT(DEPTNO, DNAME, LOC)
```

```
VALUES (10, 'ACCOUNTING', 'NEW YORK');
```

```
INSERT INTO DEPT VALUES (20, 'RESEARCH', 'DALLAS');
```

```
INSERT INTO DEPT(DNAME, DEPTNO, LOC)
```

```
VALUES ('SALES', 30, 'CHICAGO');
```

```
INSERT INTO DEPT(DEPTNO, LOC, DNAME)
```

```
VALUES (40, 'BOSTON', 'OPERATIONS');
```

Εισαγωγή Στοιχείων (emp) 1/2

```
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
```

```
VALUES (7369, 'SMITH', 'CLERK', 7902, '1980/12/17', 800, NULL, 20);
```

```
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
```

```
VALUES (7499, 'ALLEN', 'SALESMAN', 7698, '1981/02/20', 1600, 300, 30);
```

```
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
```

```
VALUES (7521, 'WARD', 'SALESMAN', 7698, '2002/02/01', 1250, 500, 30);
```

```
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
```

```
VALUES (7566, 'JONES', 'MANAGER', 7839, '1981/12/24', 2975, NULL, 20);
```

```
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
```

```
VALUES (7654, 'MARTIN', 'SALESMAN', 7698, '1981/10/28', 1250, 1400, 30);
```

```
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
```

```
VALUES (7698, 'BLAKE', 'MANAGER', 7839, '2001/05/02', 2850, NULL, 30);
```

```
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
```

```
VALUES (7782, 'CLARK', 'MANAGER', 7839, '1981/11/27', 2450, NULL, 10);
```

```
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
```

```
VALUES (7788, 'SCOTT', 'ANALYST', 7566, '1987/04/29', 3000, NULL, 20);
```

Εισαγωγή Στοιχείων (emp) 2/2

```
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
VALUES (7839, 'KING', 'PRESIDENT', NULL, '1987/11/12', 5000, NULL, 10);
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
VALUES (7844, 'TURNER', 'SALESMAN', 7698, '2007/10/19', 1500, 0, 30);
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
VALUES (7876, 'ADAMS', 'CLERK', 7788, '2003/05/07', 1100, NULL, 20);
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
VALUES (7900, 'JAMES', 'CLERK', 7698, '2003/12/12', 950, NULL, 30);
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
VALUES (7902, 'FORD', 'ANALYST', 7566, '2003/12/19', 3000, NULL, 20);
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
VALUES (7934, 'MILLER', 'CLERK', 7782, '2003/01/19', 1300, NULL, 10);
INSERT INTO EMP(EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
VALUES (7999, 'BATES', 'ANALYST', 7566, '2004/01/04', 1300, NULL, NULL);
```

Σύνταξη απλής δήλωσης SELECT

SELECT απλές στήλες, τίτλους στα αποτελέσματα, πράξεις μεταξύ στηλών, συναρτήσεις, τελεστή **DISTINCT**

FROM όνομα ενός πίνακα ή πινάκων

WHERE συνθήκη

Οπού η συνθήκη ανάλογα και με την εντολή θα περιλαμβάνει **παρενθέσεις**, τελεστές Boole (**AND,OR,NOT**), **BETWEEN ... AND, LIKE**, τελεστές σύγκρισης (**>, <, >=, <=, <>**), φωλιασμένη αναζήτηση (**SELECT ... SELECT**), **ORDER BY** κριτήρια ταξινόμησης

Η βάση δεδομένων

```
mysql> SELECT * FROM DEPT;
```

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

```
4 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
mysql>
```




Δοκιμάστε τις δηλώσεις SELECT

Ποιό το αποτέλεσμα;

Στις επόμενες δηλώσεις SELECT δείχνουμε τους Πίνακες της βάσης στους οποίους θα δοκιμάσουμε την εντολή.
Προσπαθήστε να προβλέψετε το αποτέλεσμα.



Προπαθήστε να προβλέψετε το αποτέλεσμα

```
SELECT * FROM emp;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	17-DEC-80	800		20
7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30
7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30
7566	JONES	MANAGER	7839	02-APR-81	2975		20
7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30
7698	BLAKE	MANAGER	7839	01-MAY-81	2850		30
7782	CLARK	MANAGER	7839	09-JUN-81	2450		10
7788	SCOTT	ANALYST	7566	19-APR-87	3000		20
7839	KING	PRESIDENT		17-NOV-81	5000		10
7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30
7876	ADAMS	CLERK	7788	23-MAY-87	1100		20
7900	JAMES	CLERK	7698	03-DEC-81	950		30
7902	FORD	ANALYST	7566	03-DEC-81	3000		20
7934	MILLER	CLERK	7782	23-JAN-82	1300		10
7999	BATES	ANALYST	7566	23-JAN-04	1300		

```
SELECT empno, ename, job, sal  
FROM EMP  
WHERE job IN ('ANALYST', 'PROGRAMMER');
```



Αποτελέσματα εντολής SELECT

```
SELECT * FROM emp;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	17-DEC-80	800		20
7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30
7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30
7566	JONES	MANAGER	7839	02-APR-81	2975		20
7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30
7698	BLAKE	MANAGER	7839	01-MAY-81	2850		30
7782	CLARK	MANAGER	7839	09-JUN-81	2450		10
7788	SCOTT	ANALYST	7566	19-APR-87	3000		20
7839	KING	PRESIDENT		17-NOV-81	5000		10
7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30
7876	ADAMS	CLERK	7788	23-MAY-87	1100		20
7900	JAMES	CLERK	7698	03-DEC-81	950		30
7902	FORD	ANALYST	7566	03-DEC-81	3000		20
7934	MILLER	CLERK	7782	23-JAN-82	1300		10
7999	BATES	ANALYST	7566	23-JAN-04	1300		

```
SELECT empno, ename, job, sal  
FROM EMP  
WHERE job IN ('ANALYST', 'PROGRAMMER');
```

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
mysql> SELECT empno, ename, job, sal  
-> FROM EMP  
-> WHERE job IN ('ANALYST', 'PROGRAMMER');
```

empno	ename	job	sal
7788	SCOTT	ANALYST	3000.00
7902	FORD	ANALYST	3000.00
7999	BATES	ANALYST	1300.00

```
3 rows in set (0.00 sec)
```



Δήλωση SELECT

Συνηθισμένη σύνταξη της δήλωσης SELECT:

SELECT ονόματα στηλών ή αριθμητικές εκφράσεις κ.λπ.
FROM όνομα πίνακα ή ονόματα πινάκων
WHERE συνθήκη
ORDER BY όνομα_πίνακα.όνομα_στήλης ASC ή DESC ή
τίποτα, κ.λπ.

Παράδειγμα

```
SELECT empno, ename, job, sal  
FROM emp  
WHERE job IN ('ANALYST', 'PROGRAMMER')  
AND sal >= 1000 AND sal <= 7000  
ORDER BY job, ename;
```

Πως σχηματίζουμε σύνθετες συνθήκες (**WHERE**)

Για να σχηματίσουμε συνθήκες μπορούμε να χρησιμοποιήσουμε:

1. τελεστές σύγκρισης (>, <, >=, <=, !=, <>), όπου οι δύο τελευταίοι (ή και άλλοι ανάλογα με το προϊόν) συμβολίζουν το διάφορο.
2. αριθμητικούς (+, -, /, *),
3. τελεστές Boole (AND, OR, NOT),
4. τελεστή LIKE ή NOT LIKE (π.χ. ENAME NOT LIKE '%ΑΣ'),
5. τελεστές BETWEEN ...AND ή NOT BETWEEN ...AND
π.χ., SAL BETWEEN 2500 AND 3000
- 6) σύνολα τιμών (τελεστής IN)
π.χ., JOB IN ('ΠΩΛΗΤΗΣ', 'ΑΝΑΛΥΤΗΣ ΣΥΣΤΗΜΑΤΩΝ'),
- 7) παρενθέσεις.

```
mysql>
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	HIREDATE	MGR	SAL	COMM	DEPTNO
10	CODD	ANALYST	1989-01-01	15	3000.00	NULL	10
15	ELMASRI	ANALYST	1995-05-02	15	1200.00	150.00	10
20	NAVATHE	SALESMAN	1977-07-07	20	2000.00	NULL	20
30	DATE	PROGRAMMER	2004-05-04	15	1800.00	200.00	10

4 rows in set (0.00 sec)

```
mysql> SELECT * FROM EMP
-> WHERE SAL>1800;
```

EMPNO	ENAME	JOB	HIREDATE	MGR	SAL	COMM	DEPTNO
10	CODD	ANALYST	1989-01-01	15	3000.00	NULL	10
20	NAVATHE	SALESMAN	1977-07-07	20	2000.00	NULL	20

2 rows in set (0.00 sec)

```
mysql> SELECT * FROM EMP
-> WHERE SAL>=1800;
```

EMPNO	ENAME	JOB	HIREDATE	MGR	SAL	COMM	DEPTNO
10	CODD	ANALYST	1989-01-01	15	3000.00	NULL	10
20	NAVATHE	SALESMAN	1977-07-07	20	2000.00	NULL	20
30	DATE	PROGRAMMER	2004-05-04	15	1800.00	200.00	10

3 rows in set (0.00 sec)

```
mysql> SELECT * FROM EMP
-> WHERE SAL<>3000;
```

EMPNO	ENAME	JOB	HIREDATE	MGR	SAL	COMM	DEPTNO
15	ELMASRI	ANALYST	1995-05-02	15	1200.00	150.00	10
20	NAVATHE	SALESMAN	1977-07-07	20	2000.00	NULL	20
30	DATE	PROGRAMMER	2004-05-04	15	1800.00	200.00	10

3 rows in set (0.00 sec)

EMPNO	ENAME	JOB	HIREDATE	MGR	SAL	COMM	DEPTNO
10	CODD	ANALYST	1989-01-01	15	3000.00	NULL	10
15	ELMASRI	ANALYST	1995-05-02	15	1200.00	150.00	10
20	NAVATHE	SALESMAN	1977-07-07	20	2000.00	NULL	20
30	DATE	PROGRAMMER	2004-05-04	15	1800.00	200.00	10

4 rows in set (0.00 sec)

```
mysql> SELECT empno, ename, job, sal
-> FROM emp
-> WHERE job='ANALYST';
```

empno	ename	job	sal
10	CODD	ANALYST	3000.00
15	ELMASRI	ANALYST	1200.00

2 rows in set (0.00 sec)

```
mysql> SELECT empno, ename, job, sal
-> FROM emp
-> WHERE job='ANALYST' OR job='SALESMAN';
```

empno	ename	job	sal
10	CODD	ANALYST	3000.00
15	ELMASRI	ANALYST	1200.00
20	NAVATHE	SALESMAN	2000.00

3 rows in set (0.00 sec)

```
mysql> SELECT empno, ename, job, sal
-> FROM emp
-> WHERE job='ANALYST'
-> AND sal >= 1000;
```

empno	ename	job	sal
10	CODD	ANALYST	3000.00
15	ELMASRI	ANALYST	1200.00

2 rows in set (0.00 sec)


```
mysql>
mysql> SELECT * FROM EMP
-> WHERE SAL <> 3000;
+-----+-----+-----+-----+-----+-----+-----+-----+
| EMPNO | ENAME   | JOB       | HIREDATE | MGR  | SAL      | COMM    | DEPTNO |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 15    | ELMASRI | ANALYST   | 1995-05-02 | 15   | 1200.00  | 150.00  | 10     |
| 20    | NAVATHE | SALESMAN  | 1977-07-07 | 20   | 2000.00  | NULL    | 20     |
| 30    | DATE    | PROGRAMMER | 2004-05-04 | 15   | 1800.00  | 200.00  | 10     |
+-----+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> SELECT * FROM EMP
-> WHERE SAL != 3000;
+-----+-----+-----+-----+-----+-----+-----+-----+
| EMPNO | ENAME   | JOB       | HIREDATE | MGR  | SAL      | COMM    | DEPTNO |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 15    | ELMASRI | ANALYST   | 1995-05-02 | 15   | 1200.00  | 150.00  | 10     |
| 20    | NAVATHE | SALESMAN  | 1977-07-07 | 20   | 2000.00  | NULL    | 20     |
| 30    | DATE    | PROGRAMMER | 2004-05-04 | 15   | 1800.00  | 200.00  | 10     |
+-----+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	HIREDATE	MGR	SAL	COMM	DEPTNO
10	CODD	ANALYST	1989-01-01	15	3000.00	NULL	10
15	ELMASRI	ANALYST	1995-05-02	15	1200.00	150.00	10
20	NAVATHE	SALESMAN	1977-07-07	20	2000.00	NULL	20
30	DATE	PROGRAMMER	2004-05-04	15	1800.00	200.00	10

4 rows in set (0.00 sec)

```
mysql> SELECT empno, ename, job, sal
-> FROM emp
-> WHERE job IN ('ANALYST', 'PROGRAMMER')
-> AND sal >= 1000 AND sal <= 7000
-> ORDER BY job, ename;
```

empno	ename	job	sal
10	CODD	ANALYST	3000.00
15	ELMASRI	ANALYST	1200.00
30	DATE	PROGRAMMER	1800.00

3 rows in set (0.00 sec)

Προσοχή στο null!

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	HIREDATE	MGR	SAL	COMM	DEPTNO
10	CODD	ANALYST	1989-01-01	15	3000.00	NULL	10
15	ELMASRI	ANALYST	1995-05-02	15	1200.00	150.00	10
20	NAVATHE	SALESMAN	1977-07-07	20	2000.00	NULL	20
30	DATE	PROGRAMMER	2004-05-04	15	1800.00	200.00	10

```
4 rows in set (0.00 sec)
```

```
mysql> SELECT EMPNO, ENAME, JOB, SAL, COMM, SAL+COMM, SAL+IFNULL(COMM,0)  
-> FROM EMP;
```

EMPNO	ENAME	JOB	SAL	COMM	SAL+COMM	SAL+IFNULL(COMM,0)
10	CODD	ANALYST	3000.00	NULL	NULL	3000.00
15	ELMASRI	ANALYST	1200.00	150.00	1350.00	1350.00
20	NAVATHE	SALESMAN	2000.00	NULL	NULL	2000.00
30	DATE	PROGRAMMER	1800.00	200.00	2000.00	2000.00

```
4 rows in set (0.00 sec)
```

Αναζητήσεις που περιλαμβάνουν υπολογισμούς, πράξεις σε strings κλπ. (**SELECT**)

Για να υπολογίσεις αθροίσματα, γινόμενα, μέσους όρους κλπ. μπορείς να χρησιμοποιήσεις κατά την επιλογή στηλών (οι εντολές είναι σε mysql):

1. αριθμητικούς τελεστές (+, -, *, /),
2. συναρτήσεις όπως
 - IFNULL-Null Value,
 - POWER-ύψωση σε δύναμη,
 - ROUND-στρογγύλευση,
 - TRUNCATE-αποκοπή,
 - SUBSTR/SUBSTRING-substring,
 - UPPER-μεταγραφή σε κεφαλαία,
 - AVG-μέσος όρος,
 - MAX-μέγιστη τιμή,
 - MIN-ελάχιστη τιμή,
 - SUM-άθροισμα τιμών,
 - COUNT-πόσες είναι οι τιμές
 - κλπ.
3. παρενθέσεις,
4. τελεστή DISTINCT

Οι συναρτήσεις συχνά διαφέρουν από προϊόν σε προϊόν: IFNULL (MySQL) vs NVL-Null VaLue (ORACLE)

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	HIREDATE	MGR	SAL	COMM	DEPTNO
10	CODD	ANALYST	1989-01-01	15	3000.00	NULL	10
15	ELMASRI	ANALYST	1995-05-02	15	1200.00	150.00	10
20	NAVATHE	SALESMAN	1977-07-07	20	2000.00	NULL	20
30	DATE	PROGRAMMER	2004-05-04	15	1800.00	200.00	10

```
4 rows in set (0.00 sec)
```

```
mysql> SELECT MAX(SAL), MIN(SAL), AVG(SAL), COUNT(SAL)  
-> FROM EMP;
```

MAX(SAL)	MIN(SAL)	AVG(SAL)	COUNT(SAL)
3000.00	1200.00	2000.000000	4

```
1 row in set (0.00 sec)
```

```
mysql> _
```

```
mysql> SELECT * FROM EMP;
+-----+-----+-----+-----+-----+-----+-----+-----+
| EMPNO | ENAME   | JOB           | HIREDATE   | MGR  | SAL      | COMM    | DEPTNO |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 10    | CODD    | ANALYST      | 1989-01-01 | 15   | 3000.00  | NULL    | 10     |
| 15    | ELMASRI| ANALYST      | 1995-05-02 | 15   | 1200.00  | 150.00  | 10     |
| 20    | NAVATHE| SALESMAN     | 1977-07-07 | 20   | 2000.00  | NULL    | 20     |
| 30    | DATE   | PROGRAMMER   | 2004-05-04 | 15   | 1800.00  | 200.00  | 10     |
+-----+-----+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> SELECT EMPNO, LOWER(ENAME), SUBSTR(ENAME, 1,3)
-> FROM EMP;
+-----+-----+-----+
| EMPNO | LOWER(ENAME) | SUBSTR(ENAME, 1,3) |
+-----+-----+-----+
| 10    | codd         | COD                |
| 15    | elmasri     | ELM                |
| 20    | navathe     | NAV                |
| 30    | date        | DAT                |
+-----+-----+-----+
4 rows in set (0.00 sec)

mysql>
```

Διαφέρουν οι παρακάτω δηλώσεις; Γιατί;

```
select SUM(sal)/COUNT(sal) from Emp;
```

```
select AVG(sal) from Emp;
```

```
select SUM(sal)/COUNT(*) from Emp;
```

```
select SUM(comm)/COUNT(comm) from Emp;
```

```
select AVG(comm) from Emp;
```

```
select SUM(comm) / COUNT(*) from Emp;
```

```
mysql>
mysql> select SUM(sa1)/COUNT(sa1) from Emp;
+-----+
| SUM(sa1)/COUNT(sa1) |
+-----+
|          2021.666667 |
+-----+
1 row in set (0.00 sec)

mysql> select AVG(sa1) from Emp;
+-----+
| AVG(sa1) |
+-----+
| 2021.666667 |
+-----+
1 row in set (0.00 sec)

mysql> select SUM(sa1)/COUNT(*) from Emp;
+-----+
| SUM(sa1)/COUNT(*) |
+-----+
|          2021.666667 |
+-----+
1 row in set (0.00 sec)
```



```
mysql> select SUM(sal) / COUNT(*) from Emp;
+-----+
| SUM(sal) / COUNT(*) |
+-----+
|          2021.666667 |
+-----+
1 row in set (0.00 sec)

mysql> select SUM(comm) / COUNT(comm) from Emp;
+-----+
| SUM(comm) / COUNT(comm) |
+-----+
|          550.000000 |
+-----+
1 row in set (0.00 sec)

mysql> select AVG(comm) from Emp;
+-----+
| AVG(comm) |
+-----+
| 550.000000 |
+-----+
1 row in set (0.00 sec)

mysql> select SUM(comm) / COUNT(*) from Emp;
+-----+
| SUM(comm) / COUNT(*) |
+-----+
|          146.666667 |
+-----+
1 row in set (0.00 sec)
```



Προσπαθήστε να προβλέψετε το
αποτέλεσμα στις επόμενες δηλώσεις
SELECT

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

15 rows in set (0.00 sec)

```
SELECT empno "κωδικός",ename "όνομα",job "θέση", sal "αμοιβή",  
       sal+IFNULL(comm, 0) "σύνολο"
```

```
FROM EMP
```

```
WHERE job IN ('ANALYST', 'PROGRAMMER')
```

```
ORDER BY job, ename;
```

```
SELECT empno "κωδικός",ename "όνομα",job "θέση", sal "αμοιβή",  
       sal+IFNULL(comm, 0) "σύνολο"
```

```
FROM EMP
```

```
WHERE job='ANALYST' OR JOB= 'PROGRAMMER'
```

```
ORDER BY job, ename;
```

```
mysql> SELECT empno "κωδικός",ename "όνομα",job "θέση", sal "αμοιβή",
->          sal+IFNULL(comm, 0) "σύνολο"
-> FROM EMP
-> WHERE job IN ('ANALYST', 'PROGRAMMER')
-> ORDER BY job, ename;
```

κωδικός	όνομα	θέση	αμοιβή	σύνολο
7999	BATES	ANALYST	1300.00	1300.00
7902	FORD	ANALYST	3000.00	3000.00
7788	SCOTT	ANALYST	3000.00	3000.00

3 rows in set (0.00 sec)

```
mysql> SELECT empno "κωδικός",ename "όνομα",job "θέση", sal "αμοιβή",
->          sal+IFNULL(comm, 0) "σύνολο"
-> FROM EMP
-> WHERE job="ANALYST" OR JOB="PROGRAMMER"
-> ORDER BY job, ename;
```

κωδικός	όνομα	θέση	αμοιβή	σύνολο
7999	BATES	ANALYST	1300.00	1300.00
7902	FORD	ANALYST	3000.00	3000.00
7788	SCOTT	ANALYST	3000.00	3000.00

3 rows in set (0.00 sec)

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
SELECT AVG(sal), MIN(sal), MAX(sal), SUM(sal), COUNT(sal),  
SUM((sal+IFNULL(comm,0))), COUNT(sal), COUNT(comm), COUNT(*)  
FROM EMP;
```

```
mysql>
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
mysql> SELECT AVG(sal), MIN(sal), MAX(sal), SUM(sal), COUNT(sal), SUM((sal+IFNULL(comm,0))), COUNT(sal), COUNT(comm), COUNT(*)
-> FROM EMP;
```

AVG(sal)	MIN(sal)	MAX(sal)	SUM(sal)	COUNT(sal)	SUM((sal+IFNULL(comm,0)))	COUNT(sal)	COUNT(comm)	COUNT(*)
2021.666667	800.00	5000.00	30325.00	15	32525.00	15	4	15

```
1 row in set (0.00 sec)
```

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

15 rows in set (0.00 sec)

```
SELECT AVG(sal), MIN(sal), MAX(sal), SUM(sal), COUNT(sal), SUM(sal),  
        COUNT(sal), COUNT(*)  
FROM EMP  
WHERE job='ANALYST';
```

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
mysql> SELECT AVG(sal), MIN(sal), MAX(sal), SUM(sal), COUNT(sal), SUM(sal),  
-> COUNT(sal), COUNT(*)  
-> FROM EMP  
-> WHERE job="ANALYST";
```

AVG(sal)	MIN(sal)	MAX(sal)	SUM(sal)	COUNT(sal)	SUM(sal)	COUNT(sal)	COUNT(*)
2433.333333	1300.00	3000.00	7300.00	3	7300.00	3	3

```
1 row in set (0.00 sec)
```



```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
SELECT AVG(sal), MIN(sal), MAX(sal), SUM(sal), COUNT(sal), SUM(sal),  
COUNT(sal), COUNT(comm), COUNT(*)  
FROM EMP  
WHERE job= 'ANALYST' OR job='SALESMAN';
```

```
mysql>
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
mysql> SELECT AVG(sal), MIN(sal), MAX(sal), SUM(sal), COUNT(sal), SUM(comm), COUNT(comm), COUNT(*)
-> FROM EMP
-> WHERE job="ANALYST" OR job="SALESMAN";
```

AVG(sal)	MIN(sal)	MAX(sal)	SUM(sal)	COUNT(sal)	SUM(comm)	COUNT(comm)	COUNT(*)
1842.857143	1250.00	3000.00	12900.00	7	12900.00	7	7

```
1 row in set (0.00 sec)
```

```
mysql>
```

DISTINCT

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
SELECT DISTINCT job  
FROM EMP  
ORDER BY job;
```

```
SELECT DISTINCT deptno, job  
FROM EMP  
ORDER BY deptno, job;
```

DISTINCT

```
mysql>
mysql> SELECT * FROM EMP;
+-----+-----+-----+-----+-----+-----+-----+-----+
| EMPNO | ENAME  | JOB      | MGR   | HIREDATE | SAL      | COMM     | DEPTNO |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 7369  | SMITH  | CLERK    | 7902  | 1980-12-17 | 800.00   | NULL     | 20     |
| 7499  | ALLEN  | SALESMAN | 7698  | 1981-02-20 | 1600.00  | 300.00   | 30     |
| 7521  | WARD   | SALESMAN | 7698  | 2002-02-01 | 1250.00  | 500.00   | 30     |
| 7566  | JONES  | MANAGER  | 7839  | 1981-12-24 | 2975.00  | NULL     | 20     |
| 7654  | MARTIN | SALESMAN | 7698  | 1981-10-28 | 1250.00  | 1400.00  | 30     |
| 7698  | BLAKE  | MANAGER  | 7839  | 2001-05-02 | 2850.00  | NULL     | 30     |
| 7782  | CLARK  | MANAGER  | 7839  | 1981-11-27 | 2450.00  | NULL     | 10     |
| 7788  | SCOTT  | ANALYST  | 7566  | 1987-04-29 | 3000.00  | NULL     | 20     |
| 7839  | KING   | PRESIDENT | NULL  | 1987-11-12 | 5000.00  | NULL     | 10     |
| 7844  | TURNER | SALESMAN | 7698  | 2007-10-19 | 1500.00  | 0.00     | 30     |
| 7876  | ADAMS  | CLERK    | 7788  | 2003-05-07 | 1100.00  | NULL     | 20     |
| 7900  | JAMES  | CLERK    | 7698  | 2003-12-12 | 950.00   | NULL     | 30     |
| 7902  | FORD   | ANALYST  | 7566  | 2003-12-19 | 3000.00  | NULL     | 20     |
| 7934  | MILLER | CLERK    | 7782  | 2003-01-19 | 1300.00  | NULL     | 10     |
| 7999  | BATES  | ANALYST  | 7566  | 2004-01-04 | 1300.00  | NULL     | NULL   |
+-----+-----+-----+-----+-----+-----+-----+-----+
15 rows in set (0.00 sec)

mysql> SELECT DISTINCT job
-> FROM EMP
-> ORDER BY job;
+-----+
| job      |
+-----+
| ANALYST  |
| CLERK    |
| MANAGER  |
| PRESIDENT |
| SALESMAN |
+-----+
5 rows in set (0.00 sec)

mysql>
```

DISTINCT

```
mysql>  
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
mysql> SELECT DISTINCT deptno, job  
-> FROM EMP  
-> ORDER BY deptno, job;
```

deptno	job
NULL	ANALYST
10	CLERK
10	MANAGER
10	PRESIDENT
20	ANALYST
20	CLERK
20	MANAGER
30	CLERK
30	MANAGER
30	SALESMAN

```
10 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
SELECT empno, ename, job, sal
FROM EMP
WHERE job IN ('ANALYST', 'PROGRAMMER')
AND sal >= 1000 AND sal <= 7000;
```

```
SELECT empno, ename, job, sal
FROM EMP
WHERE (job IN ('ANALYST', 'PROGRAMMER'))
AND (sal >= 1300 OR sal + IFNULL(comm, 0) >= 1800)
ORDER BY job, ename, sal;
```

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
mysql> SELECT empno, ename, job, sal  
-> FROM EMP  
-> WHERE job IN ("ANALYST", "PROGRAMMER")  
-> AND sal >= 1000 AND sal <= 7000;
```

empno	ename	job	sal
7788	SCOTT	ANALYST	3000.00
7902	FORD	ANALYST	3000.00
7999	BATES	ANALYST	1300.00

```
3 rows in set (0.00 sec)
```

```
mysql>
```

```
mysql>
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

15 rows in set (0.00 sec)

```
mysql> SELECT empno, ename, job, sal
-> FROM EMP
-> WHERE (job IN ("ANALYST", "PROGRAMMER"))
-> AND (sal >= 1300 OR sal+IFNULL(comm,0) >= 1800)
-> ORDER BY job, ename, sal;
```

empno	ename	job	sal
7999	BATES	ANALYST	1300.00
7902	FORD	ANALYST	3000.00
7788	SCOTT	ANALYST	3000.00

3 rows in set (0.00 sec)

LIKE

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
SELECT ename, job, sal  
FROM EMP  
WHERE job IN ('ANALYST', 'PROGRAMMER')  
AND ename LIKE '%ES'  
AND sal BETWEEN 1000 AND 7000;
```

LIKE

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
mysql> SELECT ename, job, sal  
-> FROM EMP  
-> WHERE job IN ("ANALYST", "PROGRAMMER")  
-> AND ename LIKE "%ES"  
-> AND sal BETWEEN 1000 AND 7000;
```

ename	job	sal
BATES	ANALYST	1300.00

```
1 row in set (0.00 sec)
```

Πως σχηματίζουμε συνθήκες που περιλαμβάνουν υποαναζήτηση (SELECT)

Για το σχηματισμό συνθήκης με υποαναζήτηση μπορείς να χρησιμοποιήσεις:

- 1) τελεστές σύγκρισης (>, <, >=, <=, =, !=, <>)
- 2) τελεστές Boole (AND, OR, NOT)
- 3) παρενθέσεις
- 4) τελεστές ANY, ALL, IN, EXIST
- 7) συναρτήσεις.

Υποαναζήτηση φωλιασμένη σε αναζήτηση

```
SELECT ename, job, sal, deptno
FROM EMP
WHERE sal > (SELECT MIN(sal)
             FROM EMP
             WHERE deptno IN (10, 20))
ORDER BY deptno, ename;
```

Η υποπρόταση `SELECT MIN(sal) FROM EMP WHERE deptno IN (10, 20)` έχει ως αποτέλεσμα

MIN(SAL)

800

Επομένως η αρχική εκτελείται ως

```
SELECT ename, job, sal, deptno
FROM EMP
WHERE sal > 800
ORDER BY deptno, ename;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

15 rows in set (0.00 sec)

```
mysql> SELECT ename, job, sal, deptno
-> FROM EMP
-> WHERE sal > (SELECT MIN(sal)
-> FROM EMP
-> WHERE deptno IN (10, 20))
-> ORDER BY deptno, ename;
```

ename	job	sal	deptno
BATES	ANALYST	1300.00	NULL
CLARK	MANAGER	2450.00	10
KING	PRESIDENT	5000.00	10
MILLER	CLERK	1300.00	10
ADAMS	CLERK	1100.00	20
FORD	ANALYST	3000.00	20
JONES	MANAGER	2975.00	20
SCOTT	ANALYST	3000.00	20
ALLEN	SALESMAN	1600.00	30
BLAKE	MANAGER	2850.00	30
JAMES	CLERK	950.00	30
MARTIN	SALESMAN	1250.00	30
TURNER	SALESMAN	1500.00	30
WARD	SALESMAN	1250.00	30

Υποαναζήτηση φωλιασμένη σε αναζήτηση

```
SELECT ename, job, sal, deptno
FROM EMP
WHERE sal > (SELECT MIN(sal)
             FROM EMP
             WHERE deptno IN (SELECT deptno FROM dept
                              WHERE dname IN ('RESEARCH', 'SALES')))
ORDER BY deptno, ename;
```

```
mysql>
mysql> SELECT * FROM DEPT;
+-----+-----+-----+
| DEPTNO | DNAME      | LOC      |
+-----+-----+-----+
|      10 | ACCOUNTING | NEW YORK |
|      20 | RESEARCH   | DALLAS   |
|      30 | SALES      | CHICAGO  |
|      40 | OPERATIONS | BOSTON   |
+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> SELECT deptno FROM dept WHERE dname IN ("RESEARCH", "SALES");
+-----+
| deptno |
+-----+
|      20 |
|      30 |
+-----+
2 rows in set (0.00 sec)
```

```
mysql>
mysql> SELECT empno, ename, job, sal, deptno
-> FROM EMP
-> WHERE sal > (SELECT MIN(sal)
-> FROM EMP
-> WHERE deptno IN (10, 20))
-> ORDER BY deptno, ename;
```

empno	ename	job	sal	deptno
7999	BATES	ANALYST	1300.00	NULL
7782	CLARK	MANAGER	2450.00	10
7839	KING	PRESIDENT	5000.00	10
7934	MILLER	CLERK	1300.00	10
7876	ADAMS	CLERK	1100.00	20
7902	FORD	ANALYST	3000.00	20
7566	JONES	MANAGER	2975.00	20
7788	SCOTT	ANALYST	3000.00	20
7499	ALLEN	SALESMAN	1600.00	30
7698	BLAKE	MANAGER	2850.00	30
7900	JAMES	CLERK	950.00	30
7654	MARTIN	SALESMAN	1250.00	30
7844	TURNER	SALESMAN	1500.00	30
7521	WARD	SALESMAN	1250.00	30

14 rows in set (0.01 sec)

```
mysql> SELECT ename, job, sal, deptno
-> FROM EMP
-> WHERE sal > (SELECT MIN(sal)
-> FROM EMP
-> WHERE deptno IN (SELECT deptno FROM dept
-> WHERE dname IN ("RESEARCH", "SALES")))
-> ORDER BY deptno, ename;
```

ename	job	sal	deptno
BATES	ANALYST	1300.00	NULL
CLARK	MANAGER	2450.00	10
KING	PRESIDENT	5000.00	10
MILLER	CLERK	1300.00	10
ADAMS	CLERK	1100.00	20
FORD	ANALYST	3000.00	20
JONES	MANAGER	2975.00	20
SCOTT	ANALYST	3000.00	20
ALLEN	SALESMAN	1600.00	30
BLAKE	MANAGER	2850.00	30
JAMES	CLERK	950.00	30
MARTIN	SALESMAN	1250.00	30
TURNER	SALESMAN	1500.00	30
WARD	SALESMAN	1250.00	30

```
14 rows in set (0.01 sec)
```


Απλές αναζητήσεις βασιζόμενες σε ένα πίνακα

δήλωση **SELECT ... FROM tablename ...;**

Μία αρκετά γενική μορφή της δήλωσης αναζήτησης είναι η παρακάτω:

SELECT στήλες

FROM όνομα πίνακα

WHERE συνθήκη

GROUP BY απλές στήλες ή πράξεις μεταξύ στηλών (επιτρέπεται η χρήση παρενθέσεων)

HAVING συνθήκη που περιλαμβάνει στήλες που ανήκουν στην υποπρόταση **GROUP BY** ή άλλες στήλες με ταυτόχρονη χρήση (ομαδοποιητικών, αθροιστικών) συναρτήσεων

ORDER BY κριτήρια ταξινόμησης;

Χρήση υποπρότασης GROUP BY

```
SELECT deptno, COUNT(*)  
FROM emp  
GROUP BY DEPTNO;
```

Ο παρακάτω πίνακας διαμερίζεται λόγω της υποπρότασης GROUP BY DEPTNO

```
mysql>  
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
mysql>
mysql> SELECT * FROM EMP ORDER BY DEPTNO;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30

```
15 rows in set (0.00 sec)

mysql> _
```

```
mysql> SELECT deptno, COUNT(*)
-> FROM emp
-> GROUP BY DEPTNO;
```

deptno	COUNT(*)
NULL	1
10	3
20	5
30	6

```
4 rows in set (0.00 sec)
```

Ακολουθούν παραδείγματα ορθής σύνταξης της υποπρότασης

```
SELECT deptno, AVG(sal), COUNT(*)  
FROM emp  
GROUP BY DEPTNO;
```

```
SELECT deptno, AVG(sal), COUNT(*)  
FROM emp  
GROUP BY DEPTNO  
HAVING deptno > 20 AND COUNT(*)>1;
```

```
SELECT deptno, AVG(sal), COUNT(*)  
FROM emp  
GROUP BY DEPTNO  
HAVING (deptno > 20) AND (COUNT(*)>1 OR AVG(sal)>1200);
```

```
mysql> SELECT deptno, AVG(sal), COUNT(*)
-> FROM emp
-> GROUP BY DEPTNO;
```

deptno	AVG(sal)	COUNT(*)
NULL	1300.000000	1
10	2916.666667	3
20	2175.000000	5
30	1566.666667	6

```
4 rows in set (0.00 sec)
```

```
mysql>
mysql> SELECT deptno, AVG(sal), COUNT(*)
-> FROM emp
-> GROUP BY DEPTNO
-> HAVING deptno > 20 AND COUNT(*)>1;
```

deptno	AVG(sal)	COUNT(*)
30	1566.666667	6

```
1 row in set (0.00 sec)
```

```
mysql>
mysql> SELECT deptno, AVG(sal), COUNT(*)
-> FROM emp
-> GROUP BY DEPTNO
-> HAVING (deptno > 20) AND (COUNT(*)>1 OR AVG(sal)>1200);
```

deptno	AVG(sal)	COUNT(*)
30	1566.666667	6

```
1 row in set (0.00 sec)
```

```
mysql> SELECT * FROM EMP;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL

```
15 rows in set (0.00 sec)
```

```
mysql> SELECT deptno, AVG(sal), COUNT(*)
```

```
-> FROM EMP
```

```
-> GROUP BY DEPTNO
```

```
-> HAVING COUNT(*)>2
```

```
-> ORDER BY DEPTNO;
```

deptno	AVG(sal)	COUNT(*)
10	2916.666667	3
20	2175.000000	5
30	1566.666667	6

```
3 rows in set (0.00 sec)
```

WHERE ... GROUP BY

```
SELECT deptno, AVG(sal), COUNT(*)  
FROM EMP  
WHERE JOB NOT IN ('ANALYST')  
GROUP BY DEPTNO  
HAVING COUNT(*) > 2  
ORDER BY DEPTNO;
```

```
SELECT deptno, AVG(sal), COUNT(*)  
FROM EMP  
GROUP BY DEPTNO  
HAVING COUNT(*) > 2  
ORDER BY DEPTNO;
```

```
mysql> SELECT deptno, AVG(sal), COUNT(*)
-> FROM EMP
-> WHERE JOB NOT IN ("ANALYST")
-> GROUP BY DEPTNO
-> HAVING COUNT(*)>2
-> ORDER BY DEPTNO;
```

deptno	AVG(sal)	COUNT(*)
10	2916.666667	3
20	1625.000000	3
30	1566.666667	6

3 rows in set (0.00 sec)

```
mysql>
mysql> SELECT deptno, AVG(sal), COUNT(*)
-> FROM EMP
-> GROUP BY DEPTNO
-> HAVING COUNT(*)>2
-> ORDER BY DEPTNO;
```

deptno	AVG(sal)	COUNT(*)
10	2916.666667	3
20	2175.000000	5
30	1566.666667	6

3 rows in set (0.00 sec)


```
SELECT deptno, job, AVG(sal), COUNT(*)  
FROM EMP  
GROUP BY DEPTNO, JOB  
ORDER BY DEPTNO, JOB;
```

Database changed

```
mysql> select * from emp order by deptno;
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7999	BATES	ANALYST	7566	2004-01-04	1300.00	NULL	NULL
7782	CLARK	MANAGER	7839	1981-11-27	2450.00	NULL	10
7839	KING	PRESIDENT	NULL	1987-11-12	5000.00	NULL	10
7934	MILLER	CLERK	7782	2003-01-19	1300.00	NULL	10
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20
7566	JONES	MANAGER	7839	1981-12-24	2975.00	NULL	20
7788	SCOTT	ANALYST	7566	1987-04-29	3000.00	NULL	20
7876	ADAMS	CLERK	7788	2003-05-07	1100.00	NULL	20
7902	FORD	ANALYST	7566	2003-12-19	3000.00	NULL	20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30
7521	WARD	SALESMAN	7698	2002-02-01	1250.00	500.00	30
7654	MARTIN	SALESMAN	7698	1981-10-28	1250.00	1400.00	30
7698	BLAKE	MANAGER	7839	2001-05-02	2850.00	NULL	30
7844	TURNER	SALESMAN	7698	2007-10-19	1500.00	0.00	30
7900	JAMES	CLERK	7698	2003-12-12	950.00	NULL	30

15 rows in set (0.00 sec)

```
mysql> SELECT deptno, job, AVG(sal), COUNT(*)  
-> FROM EMP  
-> GROUP BY DEPTNO, JOB  
-> ORDER BY DEPTNO, JOB;
```

deptno	job	AVG(sal)	COUNT(*)
NULL	ANALYST	1300.000000	1
10	CLERK	1300.000000	1
10	MANAGER	2450.000000	1
10	PRESIDENT	5000.000000	1
20	ANALYST	3000.000000	2
20	CLERK	950.000000	2
20	MANAGER	2975.000000	1
30	CLERK	950.000000	1
30	MANAGER	2850.000000	1
30	SALESMAN	1400.000000	4

10 rows in set (0.00 sec)



Πως κατασκευάζουμε μία νέα βάση (ή νέους πίνακες) και μεταφέρουμε τα δεδομένα από την παλιά βάση (ή τους παλιούς πίνακες) στη νέα βάση (ή τους νέους πίνακες)

MySQL

```
CREATE TABLE my_employee (empno INT(4) NOT NULL,  
                           ename VARCHAR(10),  
                           deptno INT(2));
```

```
CREATE TABLE my_department (deptno INT(2) NOT NULL,  
                             dname VARCHAR(14));
```

```
INSERT INTO my_department  
  SELECT deptno, dname  
  FROM dept;
```

```
INSERT INTO my_employee  
  SELECT empno, ename, deptno  
  FROM emp;
```

```
SELECT * FROM MY_DEPARTMENT;
```

```
SELECT * FROM MY_EMPLOYEE;
```

```
mysql>
mysql> INSERT INTO my_employee
-> SELECT empno, ename, deptno
-> FROM emp;
Query OK, 15 rows affected (0.01 sec)
Records: 15 Duplicates: 0 Warnings: 0
```

```
mysql>
mysql> SELECT * FROM MY_DEPARTMENT;
```

deptno	dname
10	ACCOUNTING
20	RESEARCH
30	SALES
40	OPERATIONS

4 rows in set (0.00 sec)

```
mysql> SELECT * FROM MY_EMPLOYEE;
```

empno	ename	deptno
7369	SMITH	20
7499	ALLEN	30
7521	WARD	30
7566	JONES	20
7654	MARTIN	30
7698	BLAKE	30
7782	CLARK	10
7788	SCOTT	20
7839	KING	10
7844	TURNER	30
7876	ADAMS	20
7900	JAMES	30
7902	FORD	20
7934	MILLER	10
7999	BATES	NULL

15 rows in set (0.00 sec)



Θυμηθείτε τις διαφορές στην υλοποίηση βάσεων δεδομένων, π.χ. Oracle, MySQL

Υπάρχουν διαφορές στην υλοποίηση ανάλογα με το αν χρησιμοποιούμε το προϊόν της Oracle ή της MySQL

mySQL vs Oracle

mySQL	Oracle
-------	--------

CREATE DATABASE new_personnel;	
--------------------------------	--

USE new_personnel;	
--------------------	--

CREATE TABLE DEPT(DEPTNO INT(2) NOT NULL, DNAME VARCHAR(14), LOC VARCHAR(14));	CREATE TABLE DEPT(DEPTNO NUMBER(2) NOT NULL, DNAME VARCHAR2(14), LOC VARCHAR2(14));
--	---

CREATE TABLE EMP(EMPNO INT(4) NOT NULL, ENAME VARCHAR(10), JOB VARCHAR(25), HIREDATE DATE, MGR INT(4), SAL FLOAT(7,2), COMM FLOAT(7,2), DEPTNO INT(2));	CREATE TABLE EMP(EMPNO NUMBER(4) NOT NULL, ENAME VARCHAR2(10), JOB VARCHAR2(25), HIREDATE DATE, MGR NUMBER(4), SAL NUMBER(7,2), COMM NUMBER(7,2), DEPTNO NUMBER(2));
--	---

INSERT INTO DEPT(DEPTNO, DNAME, LOC) VALUES (10, 'ACCOUNTING', 'NEW YORK');	INSERT INTO DEPT(DEPTNO, DNAME, LOC) VALUES (10, 'ACCOUNTING', 'NEW YORK');
--	--

INSERT INTO EMP VALUES (10, 'CODD', 'ANALYST', '1989/01/01', 15, 3000, NULL, 10);	INSERT INTO EMP VALUES (10, 'CODD', 'ANALYST', '01/01/1989', 15, 3000, NULL, 10);
---	---

SELECT * FROM EMP; SELECT * FROM DEPT;	SELECT * FROM EMP; SELECT * FROM DEPT;
---	---

DROP TABLE EMP; DROP TABLE DEPT;	DROP TABLE EMP; DROP TABLE DEPT;
-------------------------------------	-------------------------------------

DROP DATABASE NEW_PERSONNEL;	
------------------------------	--

SHOW TABLES;	SELECT * FROM Tab;
--------------	--------------------

Τέλος Ενότητας

Ερωτήσεις;