**데이터베이스 시스템 과제물 제출**

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**제출일자 : 22.10.24**



**[문제 1] RANK() 함수 실습**

SQL> select empno, ename, sal,

2 rank() over (order by sal desc) as rank\_desc,

3 rank() over (order by sal) as rank\_asc

4 from emp;

EMPNO ENAME SAL RANK\_DESC RANK\_ASC

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7369 SMITH 800 17 1

7900 JAMES 950 16 2

7876 ADAMS 1100 15 3

7654 MARTIN 1250 13 4

7521 WARD 1250 13 4

7934 MILLER 1300 12 6

7844 TURNER 1500 11 7

7499 ALLEN 1600 10 8

7782 CLARK 2450 9 9

7698 BLAKE 2850 8 10

7566 JONES 2975 7 11

7902 FORD 3000 4 12

7788 SCOTT 3000 4 12

2000 Cat 3000 4 12

1000 Tiger 3600 2 15

1000 Tiger 3600 2 15

7839 KING 5000 1 17

SQL> select empno, ename, sal,

2 rank() over (order by sal) as rank\_asc

3 from emp;

EMPNO ENAME SAL RANK\_ASC

---------- ---------- ---------- ----------

7369 SMITH 800 1

7900 JAMES 950 2

7876 ADAMS 1100 3

7521 WARD 1250 4

7654 MARTIN 1250 4

7934 MILLER 1300 6

7844 TURNER 1500 7

7499 ALLEN 1600 8

7782 CLARK 2450 9

7698 BLAKE 2850 10

7566 JONES 2975 11

7788 SCOTT 3000 12

2000 Cat 3000 12

7902 FORD 3000 12

1000 Tiger 3600 15

1000 Tiger 3600 15

7839 KING 5000 17

**오름차순과 내림차순을 바꿔서 하면 순서만 바뀌는 것을 확인하였습니다.**

**[문제2] RANK() 함수 실습**

SQL> select empno, ename, sal, deptno,

2 rank() over(partition by deptno order by sal desc) "RANK"

3 from emp;

EMPNO ENAME SAL DEPTNO RANK

---------- ---------- ---------- ---------- ----------

7839 KING 5000 10 1

1000 Tiger 3600 10 2

1000 Tiger 3600 10 2

7782 CLARK 2450 10 4

7934 MILLER 1300 10 5

7788 SCOTT 3000 20 1

7902 FORD 3000 20 1

7566 JONES 2975 20 3

7876 ADAMS 1100 20 4

7369 SMITH 800 20 5

2000 Cat 3000 30 1

EMPNO ENAME SAL DEPTNO RANK

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7698 BLAKE 2850 30 2

7499 ALLEN 1600 30 3

7844 TURNER 1500 30 4

7654 MARTIN 1250 30 5

7521 WARD 1250 30 5

7900 JAMES 950 30 7

**RANK 함수를 통해 depno 그룹별로 랭킹을 출력하였습니다.**

**[문제3] OVER 함수 실습**

SQL> select empno, ename, job, sal, sum(sal) over(order by sal) "total"

2 from emp

3 where deptno = 10;

EMPNO ENAME JOB SAL total

---------- ---------- --------- ---------- ----------

7934 MILLER CLERK 1300 1300

7782 CLARK MANAGER 2450 3750

1000 Tiger 3600 10950

1000 Tiger 3600 10950

7839 KING PRESIDENT 5000 15950

**group by와 order by 절 없이 over를 이용하여 한번에 정렬하였습니다.**

**[문제4] PARTITION BY 실습**

SQL> select empno, ename, job, sal, sum(sal) over(partition by job order by sal) "total"

2 from emp;

EMPNO ENAME JOB SAL total

---------- ---------- --------- ---------- ----------

7788 SCOTT ANALYST 3000 6000

7902 FORD ANALYST 3000 6000

7369 SMITH CLERK 800 800

7900 JAMES CLERK 950 1750

7876 ADAMS CLERK 1100 2850

7934 MILLER CLERK 1300 4150

7782 CLARK MANAGER 2450 2450

7698 BLAKE MANAGER 2850 5300

7566 JONES MANAGER 2975 8275

7839 KING PRESIDENT 5000 5000

7654 MARTIN SALESMAN 1250 2500

EMPNO ENAME JOB SAL total

---------- ---------- --------- ---------- ----------

7521 WARD SALESMAN 1250 2500

7844 TURNER SALESMAN 1500 4000

7499 ALLEN SALESMAN 1600 5600

2000 Cat 3000 3000

1000 Tiger 3600 10200

1000 Tiger 3600 10200

**partition by를 지정하여 job별로 그룹핑을 하였습니다.**

**[문제5] MAX, MIN, AVG, ROUND 함수 실습**

SQL> select max(sal+nvl(comm,0)) "MAX", min(sal+nvl(comm,0)) "MIN", round(avg(sal+nvl(comm,0)),1) "AVG"

2 from emp;

MAX MIN AVG

---------- ---------- ----------

5000 800 2436.8

**이전에 실습했던 그룹 함수들을 이용하였습니다.**

**[문제6] 칼럼 요소별로 카운팅**

SQL> select count(\*) || 'EA' "TOTAL",

2 count(DECODE(TO\_CHAR(hiredate,'MM'),'01',0)) || 'EA' "JAN",

3 count(DECODE(TO\_CHAR(hiredate,'MM'),'02',0)) || 'EA' "FEB",

4 count(DECODE(TO\_CHAR(hiredate,'MM'),'03',0)) || 'EA' "MAR",

5 count(DECODE(TO\_CHAR(hiredate,'MM'),'04',0)) || 'EA' "APR",

6 count(DECODE(TO\_CHAR(hiredate,'MM'),'05',0)) || 'EA' "MAY",

7 count(DECODE(TO\_CHAR(hiredate,'MM'),'06',0)) || 'EA' "JUN",

8 count(DECODE(TO\_CHAR(hiredate,'MM'),'07',0)) || 'EA' "JUL",

9 count(DECODE(TO\_CHAR(hiredate,'MM'),'08',0)) || 'EA' "AUG",

10 count(DECODE(TO\_CHAR(hiredate,'MM'),'09',0)) || 'EA' "SEP",

11 count(DECODE(TO\_CHAR(hiredate,'MM'),'10',0)) || 'EA' "OCT",

12 count(DECODE(TO\_CHAR(hiredate,'MM'),'11',0)) || 'EA' "NOV",

13 count(DECODE(TO\_CHAR(hiredate,'MM'),'12',0)) || 'EA' "DEC"

14 from emp;

TOTAL JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

----- --- --- --- --- --- --- --- --- --- --- --- ---

17EA 2EA 3EA 2EA 0EA 1EA 1EA 0EA 1EA 2EA 0EA 1EA 1EA

**칼럼 요소별로 카운팅을 하였습니다.**

**[문제7] DECODE 함수 사용하기**

SQL> select deptno, sum(decode(job,'CLERK',sal,0)) "CLERK",

2 sum(decode(job,'MANAGER',sal,0)) "MANAGER",

3 sum(decode(job,'PRESIDENT',sal,0)) "PRESIDENT",

4 sum(decode(job,'ANALYST',sal,0)) "ANALYST",

5 sum(decode(job,'SALESMAN',sal,0)) "SALESMAN",

6 sum(NVL2(job,sal,0)) "TOTAL"

7 from emp

8 group by rollup(deptno);

DEPTNO CLERK MANAGER PRESIDENT ANALYST SALESMAN TOTAL

---------- ---------- ---------- ---------- ---------- ---------- ----------

10 1300 2450 5000 0 0 8750

20 1900 2975 0 6000 0 10875

30 950 2850 0 0 5600 9400

4150 8275 5000 6000 5600 29025

**PIVOT 함수로 시도해보았으나, total과 정렬을 위해 decode 함수로 실습해보았습니다.**

**[문제8] 오름차순 정렬하기**

SQL> select deptno, ename, sal, sum(sal) over(order by sal) "TOTAL" from emp;

DEPTNO ENAME SAL TOTAL

---------- ---------- ---------- ----------

20 SMITH 800 800

30 JAMES 950 1750

20 ADAMS 1100 2850

30 WARD 1250 5350

30 MARTIN 1250 5350

10 MILLER 1300 6650

30 TURNER 1500 8150

30 ALLEN 1600 9750

10 CLARK 2450 12200

30 BLAKE 2850 15050

20 JONES 2975 18025

20 SCOTT 3000 27025

30 Cat 3000 27025

20 FORD 3000 27025

10 Tiger 3600 34225

10 Tiger 3600 34225

10 KING 5000 39225

**over()를 이용해 오름차순으로 정렬하였습니다.**

**[문제9] 오름차순 정렬 및 그룹별로 나누기**

SQL> select deptno, ename, sal, sum(sal) over(partition by deptno order by sal) "TOTAL"

2 from emp;

DEPTNO ENAME SAL TOTAL

---------- ---------- ---------- ----------

10 MILLER 1300 1300

10 CLARK 2450 3750

10 Tiger 3600 10950

10 Tiger 3600 10950

10 KING 5000 15950

20 SMITH 800 800

20 ADAMS 1100 1900

20 JONES 2975 4875

20 SCOTT 3000 10875

20 FORD 3000 10875

30 JAMES 950 950

30 MARTIN 1250 3450

30 WARD 1250 3450

30 TURNER 1500 4950

30 ALLEN 1600 6550

30 BLAKE 2850 9400

30 Cat 3000 12400

**그룹별로 나누어 오름차순으로 정렬하였습니다.**

**[문제10] sum 함수 중복**

SQL> select deptno, ename, sal, sum(sum(sal)) over() "total\_sal",

2 round(sal/sum(sal) over() \* 100, 2) "%"

3 from emp

4 group by deptno, ename, sal

5 order by sal desc;

DEPTNO ENAME SAL total\_sal %

---------- ---------- ---------- ---------- ----------

10 KING 5000 39225 14.04

10 Tiger 3600 39225 10.11

30 Cat 3000 39225 8.42

20 FORD 3000 39225 8.42

20 SCOTT 3000 39225 8.42

20 JONES 2975 39225 8.35

30 BLAKE 2850 39225 8

10 CLARK 2450 39225 6.88

30 ALLEN 1600 39225 4.49

30 TURNER 1500 39225 4.21

10 MILLER 1300 39225 3.65

30 MARTIN 1250 39225 3.51

30 WARD 1250 39225 3.51

20 ADAMS 1100 39225 3.09

30 JAMES 950 39225 2.67

20 SMITH 800 39225 2.25

**그룹별로 누적된 값을 다시 한번 누적하여 전체 합을 구했습니다.**

**[문제11] 그룹별로 중복된 값 출력하기**

SQL> select deptno, ename, sal, sum(sal) over(partition by deptno order by deptno) "sum\_dept", round(sal/sum(sal) over(partition by deptno) \* 100,2) "%"

2 from emp;

DEPTNO ENAME SAL sum\_dept %

---------- ---------- ---------- ---------- ----------

10 CLARK 2450 15950 15.36

10 KING 5000 15950 31.35

10 Tiger 3600 15950 22.57

10 MILLER 1300 15950 8.15

10 Tiger 3600 15950 22.57

20 SMITH 800 10875 7.36

20 SCOTT 3000 10875 27.59

20 JONES 2975 10875 27.36

20 FORD 3000 10875 27.59

20 ADAMS 1100 10875 10.11

30 JAMES 950 12400 7.66

30 TURNER 1500 12400 12.1

30 MARTIN 1250 12400 10.08

30 WARD 1250 12400 10.08

30 ALLEN 1600 12400 12.9

30 Cat 3000 12400 24.19

30 BLAKE 2850 12400 22.98

**그룹별로 합과 비율을 구하는데 성공했습니다.**