

■STEP1. BASIC

Q001

- EMP, DEPT 테이블을 이용하여
FROM 절에 여러 테이블을 선언해해 다음과 같이 출력하시오

DB:DBIG
youtube.com/@DbdbigCode
Teacher Sally

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO	DEPTNO_1	DNAME	LOC
1	7369 SMITH	CLERK	7902	80/12/09	800	(null)	20	30	SALES	CHICAGO
2	7369 SMITH	CLERK	7902	80/12/09	800	(null)	20	20	RESEARCH	DALLAS
3	7369 SMITH	CLERK	7902	80/12/09	800	(null)	20	10	ACCOUNTING	NEW YORK
4	7369 SMITH	CLERK	7902	80/12/09	800	(null)	20	40	OPERATIONS	BOSTON
5	7499 ALLEN	SALESMAN	7698	81/02/11	1600	300	30	20	RESEARCH	DALLAS
6	7499 ALLEN	SALESMAN	7698	81/02/11	1600	300	30	30	SALES	CHICAGO
7	7499 ALLEN	SALESMAN	7698	81/02/11	1600	300	30	40	OPERATIONS	BOSTON
8	7499 ALLEN	SALESMAN	7698	81/02/11	1600	300	30	10	ACCOUNTING	NEW YORK
9	7521 WARD	SALESMAN	7698	81/02/23	1250	500	30	10	ACCOUNTING	NEW YORK
10	7521 WARD	SALESMAN	7698	81/02/23	1250	500	30	30	SALES	CHICAGO
11	7521 WARD	SALESMAN	7698	81/02/23	1250	500	30	20	RESEARCH	DALLAS
12	7521 WARD	SALESMAN	7698	81/02/23	1250	500	30	40	OPERATIONS	BOSTON
13	7566 JONES	MANAGER	7839	81/04/01	2975	(null)	20	10	ACCOUNTING	NEW YORK
14	7566 JONES	MANAGER	7839	81/04/01	2975	(null)	20	40	OPERATIONS	BOSTON
15	7566 JONES	MANAGER	7839	81/04/01	2975	(null)	20	30	SALES	CHICAGO
16	7566 JONES	MANAGER	7839	81/04/01	2975	(null)	20	20	RESEARCH	DALLAS
17	7654 MARTIN	SALESMAN	7698	81/09/10	1250	1400	30	30	SALES	CHICAGO
18	7654 MARTIN	SALESMAN	7698	81/09/10	1250	1400	30	40	OPERATIONS	BOSTON
19	7654 MARTIN	SALESMAN	7698	81/09/10	1250	1400	30	10	ACCOUNTING	NEW YORK
20	7654 MARTIN	SALESMAN	7698	81/09/10	1250	1400	30	20	RESEARCH	DALLAS
21	7698 BLAKE	MANAGER	7839	81/05/01	2850	(null)	30	20	RESEARCH	DALLAS
22	7698 BLAKE	MANAGER	7839	81/05/01	2850	(null)	30	10	ACCOUNTING	NEW YORK
23	7698 BLAKE	MANAGER	7839	81/05/01	2850	(null)	30	40	OPERATIONS	BOSTON
24	7698 BLAKE	MANAGER	7839	81/05/01	2850	(null)	30	30	SALES	CHICAGO
25	7782 CLARK	MANAGER	7839	81/05/09	2450	(null)	10	10	ACCOUNTING	NEW YORK
26	7782 CLARK	MANAGER	7839	81/05/09	2450	(null)	10	40	OPERATIONS	BOSTON
27	7782 CLARK	MANAGER	7839	81/05/09	2450	(null)	10	20	RESEARCH	DALLAS
28	7782 CLARK	MANAGER	7839	81/05/09	2450	(null)	10	30	SALES	CHICAGO
29	7788 SCOTT	ANALYST	7566	82/12/22	3000	(null)	20	20	RESEARCH	DALLAS
30	7788 SCOTT	ANALYST	7566	82/12/22	3000	(null)	20	30	SALES	CHICAGO
31	7788 SCOTT	ANALYST	7566	82/12/22	3000	(null)	20	40	OPERATIONS	BOSTON
32	7788 SCOTT	ANALYST	7566	82/12/22	3000	(null)	20	10	ACCOUNTING	NEW YORK
33	7839 KING	PRESIDENT	(null)	81/11/17	5000	(null)	10	40	OPERATIONS	BOSTON
34	7839 KING	PRESIDENT	(null)	81/11/17	5000	(null)	10	10	ACCOUNTING	NEW YORK
35	7839 KING	PRESIDENT	(null)	81/11/17	5000	(null)	10	20	RESEARCH	DALLAS
36	7839 KING	PRESIDENT	(null)	81/11/17	5000	(null)	10	30	SALES	CHICAGO
37	7844 TURNER	SALESMAN	7698	81/08/21	1500	0	30	40	OPERATIONS	BOSTON
38	7844 TURNER	SALESMAN	7698	81/08/21	1500	0	30	30	SALES	CHICAGO
39	7844 TURNER	SALESMAN	7698	81/08/21	1500	0	30	20	RESEARCH	DALLAS
40	7844 TURNER	SALESMAN	7698	81/08/21	1500	0	30	10	ACCOUNTING	NEW YORK
41	7876 ADAMS	CLERK	7788	83/01/15	1100	(null)	20	30	SALES	CHICAGO
42	7876 ADAMS	CLERK	7788	83/01/15	1100	(null)	20	20	RESEARCH	DALLAS
43	7876 ADAMS	CLERK	7788	83/01/15	1100	(null)	20	10	ACCOUNTING	NEW YORK
44	7876 ADAMS	CLERK	7788	83/01/15	1100	(null)	20	40	OPERATIONS	BOSTON
45	7900 JAMES	CLERK	7698	81/12/11	950	(null)	30	40	OPERATIONS	BOSTON
46	7900 JAMES	CLERK	7698	81/12/11	950	(null)	30	10	ACCOUNTING	NEW YORK
47	7900 JAMES	CLERK	7698	81/12/11	950	(null)	30	20	RESEARCH	DALLAS
48	7900 JAMES	CLERK	7698	81/12/11	950	(null)	30	30	SALES	CHICAGO
49	7902 FORD	ANALYST	7566	81/12/11	3000	(null)	20	40	OPERATIONS	BOSTON
50	7902 FORD	ANALYST	7566	81/12/11	3000	(null)	20	20	RESEARCH	DALLAS
51	7902 FORD	ANALYST	7566	81/12/11	3000	(null)	20	10	ACCOUNTING	NEW YORK
52	7902 FORD	ANALYST	7566	81/12/11	3000	(null)	20	30	SALES	CHICAGO
53	7934 MILLER	CLERK	7782	82/01/11	1300	(null)	10	40	OPERATIONS	BOSTON
54	7934 MILLER	CLERK	7782	82/01/11	1300	(null)	10	30	SALES	CHICAGO
55	7934 MILLER	CLERK	7782	82/01/11	1300	(null)	10	10	ACCOUNTING	NEW YORK
56	7934 MILLER	CLERK	7782	82/01/11	1300	(null)	10	20	RESEARCH	DALLAS

```

SELECT *
FROM EMP, DEPT
ORDER BY EMPNO;

```

Q002

- EMP, DEPT 테이블을 이용하여

EMP의 DEPTNO와 DEPT테이블의 DEPTNO가 같은 데이터를 다음과 같이 출력하시오

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO	DEPTNO_1	DNAME	LOC
1	7369	SMITH	CLERK	7902	80/12/09	800	(null)	20	20	RESEARCH	DALLAS
2	7499	ALLEN	SALESMAN	7698	81/02/11	1600	300	30	30	SALES	CHICAGO
3	7521	WARD	SALESMAN	7698	81/02/23	1250	500	30	30	SALES	CHICAGO
4	7566	JONES	MANAGER	7839	81/04/01	2975	(null)	20	20	RESEARCH	DALLAS
5	7654	MARTIN	SALESMAN	7698	81/09/10	1250	1400	30	30	SALES	CHICAGO
6	7698	BLAKE	MANAGER	7839	81/05/01	2850	(null)	30	30	SALES	CHICAGO
7	7782	CLARK	MANAGER	7839	81/05/09	2450	(null)	10	10	ACCOUNTING	NEW YORK
8	7788	SCOTT	ANALYST	7566	82/12/22	3000	(null)	20	20	RESEARCH	DALLAS
9	7839	KING	PRESIDENT	(null)	81/11/17	5000	(null)	10	10	ACCOUNTING	NEW YORK
10	7844	TURNER	SALESMAN	7698	81/08/21	1500	0	30	30	SALES	CHICAGO
11	7876	ADAMS	CLERK	7788	83/01/15	1100	(null)	20	20	RESEARCH	DALLAS
12	7900	JAMES	CLERK	7698	81/12/11	950	(null)	30	30	SALES	CHICAGO
13	7902	FORD	ANALYST	7566	81/12/11	3000	(null)	20	20	RESEARCH	DALLAS
14	7934	MILLER	CLERK	7782	82/01/11	1300	(null)	10	10	ACCOUNTING	NEW YORK

```
SELECT *  
FROM EMP, DEPT  
WHERE EMP.DEPTNO = DEPT.DEPTNO  
ORDER BY EMPNO;
```

Q003

- EMP, DEPT 테이블을 이용하여

FROM 절에 EMP 테이블의 별칭은 E, DEPT 테이블의 별칭은 D로 다음과 같이 출력하시오

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO	DEPTNO_1	DNAME	LOC
1	7369	SMITH	CLERK	7902	80/12/09	800	(null)	20	20	RESEARCH	DALLAS
2	7499	ALLEN	SALESMAN	7698	81/02/11	1600	300	30	30	SALES	CHICAGO
3	7521	WARD	SALESMAN	7698	81/02/23	1250	500	30	30	SALES	CHICAGO
4	7566	JONES	MANAGER	7839	81/04/01	2975	(null)	20	20	RESEARCH	DALLAS
5	7654	MARTIN	SALESMAN	7698	81/09/10	1250	1400	30	30	SALES	CHICAGO
6	7698	BLAKE	MANAGER	7839	81/05/01	2850	(null)	30	30	SALES	CHICAGO
7	7782	CLARK	MANAGER	7839	81/05/09	2450	(null)	10	10	ACCOUNTING	NEW YORK
8	7788	SCOTT	ANALYST	7566	82/12/22	3000	(null)	20	20	RESEARCH	DALLAS
9	7839	KING	PRESIDENT	(null)	81/11/17	5000	(null)	10	10	ACCOUNTING	NEW YORK
10	7844	TURNER	SALESMAN	7698	81/08/21	1500	0	30	30	SALES	CHICAGO
11	7876	ADAMS	CLERK	7788	83/01/15	1100	(null)	20	20	RESEARCH	DALLAS
12	7900	JAMES	CLERK	7698	81/12/11	950	(null)	30	30	SALES	CHICAGO
13	7902	FORD	ANALYST	7566	81/12/11	3000	(null)	20	20	RESEARCH	DALLAS
14	7934	MILLER	CLERK	7782	82/01/11	1300	(null)	10	10	ACCOUNTING	NEW YORK

```

SELECT *
FROM EMP E, DEPT D
WHERE E.DEPTNO = D.DEPTNO
ORDER BY EMPNO;

```

Q004

- EMP, DEPT 테이블을 이용하여
두테이블에 부서번호가 같은 열의이름이 포함되었을때 다음과 같이 출력하시오 (에러발생)

ORA-00918: column ambiguously defined

[https://docs.oracle.com/error-help/db/ora-00918/00918, 00000 - "%s: column ambiguously specified - appears in %s and %s"](https://docs.oracle.com/error-help/db/ora-00918/00918, 00000 -)

*Cause: A column name used in a join was defined in more than one table and was referenced ambiguously. In a join, any column name that occurs in more than one of the tables must be prefixed by its table name or table alias when referenced.

*Action: To avoid ambiguity, prefix references to column names that exist in multiple tables with either the table name or a table alias and a period. For example, if tables EMP and DEPT are being joined and both contain the column DEPTNO, then all references to DEPTNO should be prefixed with the table name, as in EMP.DEPTNO or DEPT.DEPTNO.

*Params: 1) column_name ambiguously.
2) table_name_1: The first table being joined that contains a reference to the ambiguously defined column name.
3) table_name_2: The second table being joined that contains a reference to the ambiguously defined column name.

19행, 22열에서 오류 발생

```
SELECT EMPNO, ENAME, DEPTNO, DNAME, LOC
FROM EMP E, DEPT D
WHERE E.DEPTNO = D.DEPTNO;
```

Q005

- EMP, DEPT 테이블을 이용하여

열 이름에 각각의 테이블 이름도 함께 명시시 다음과 같이 출력하시오 (위의 문제 해결)

	EMPNO	ENAME	DEPTNO	DNAME	LOC
1	7782	CLARK	10	ACCOUNTING	NEW YORK
2	7839	KING	10	ACCOUNTING	NEW YORK
3	7934	MILLER	10	ACCOUNTING	NEW YORK
4	7369	SMITH	20	RESEARCH	DALLAS
5	7566	JONES	20	RESEARCH	DALLAS
6	7788	SCOTT	20	RESEARCH	DALLAS
7	7876	ADAMS	20	RESEARCH	DALLAS
8	7902	FORD	20	RESEARCH	DALLAS
9	7499	ALLEN	30	SALES	CHICAGO
10	7521	WARD	30	SALES	CHICAGO
11	7654	MARTIN	30	SALES	CHICAGO
12	7698	BLAKE	30	SALES	CHICAGO
13	7844	TURNER	30	SALES	CHICAGO
14	7900	JAMES	30	SALES	CHICAGO

```
SELECT E.EMPNO, E.ENAME, D.DEPTNO, D.DNAME, D.LOC
FROM EMP E, DEPT D
WHERE E.DEPTNO = D.DEPTNO
ORDER BY D.DEPTNO, E.EMPNO;
```

Q006

- EMP, DEPT 테이블을 이용하여

급여가 3000이상인 사원의 사원번호, 이름, 급여, 근무부서를 다음과 같이 출력하시오

EMPNO	ENAME	SAL	DEPTNO	DNAME	LOC
1	7839 KING	5000	10	ACCOUNTING	NEW YORK
2	7788 SCOTT	3000	20	RESEARCH	DALLAS
3	7902 FORD	3000	20	RESEARCH	DALLAS

```

SELECT E.EMPNO, E.ENAME, E.SAL, D.DEPTNO, D.DNAME, D.LOC
FROM EMP E, DEPT D
WHERE E.DEPTNO = D.DEPTNO
AND SAL >= 3000;

```

Q007

- EMP, SALGRADE 테이블을 이용하여

유저 정보, 급여등급, 그 등급의 최소급여와 최대급여를 다음과 같이 출력하시오

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO	GRADE	LOSAL	HISAL
1	7369 SMITH	CLERK	7902	80/12/09	800	(null)	20	1	700	1200
2	7900 JAMES	CLERK	7698	81/12/11	950	(null)	30	1	700	1200
3	7876 ADAMS	CLERK	7788	83/01/15	1100	(null)	20	1	700	1200
4	7521 WARD	SALESMAN	7698	81/02/23	1250	500	30	2	1201	1400
5	7654 MARTIN	SALESMAN	7698	81/09/10	1250	1400	30	2	1201	1400
6	7934 MILLER	CLERK	7782	82/01/11	1300	(null)	10	2	1201	1400
7	7844 TURNER	SALESMAN	7698	81/08/21	1500	0	30	3	1401	2000
8	7499 ALLEN	SALESMAN	7698	81/02/11	1600	300	30	3	1401	2000
9	7782 CLARK	MANAGER	7839	81/05/09	2450	(null)	10	4	2001	3000
10	7698 BLAKE	MANAGER	7839	81/05/01	2850	(null)	30	4	2001	3000
11	7566 JONES	MANAGER	7839	81/04/01	2975	(null)	20	4	2001	3000
12	7902 FORD	ANALYST	7566	81/12/11	3000	(null)	20	4	2001	3000
13	7788 SCOTT	ANALYST	7566	82/12/22	3000	(null)	20	4	2001	3000
14	7839 KING	PRESIDENT	(null)	81/11/17	5000	(null)	10	5	3001	9999

```
select * from emp
```

```
select * from salgrade
```

```
SELECT *  
FROM EMP E, SALGRADE S  
WHERE E.SAL BETWEEN S.LOSAL AND S.HISAL;
```

Q008

- EMP테이블을 2번 이용하여
사원정보(EMPNO, ENAME, MGR) 와 직속상관(EMPNO, ENAME)의 사원번호를 다음과 같이 출력하
시오

	EMPNO	ENAME	MGR	MGR_EMPNO	MGR_ENAME
1	7788	SCOTT	7566	7566	JONES
2	7902	FORD	7566	7566	JONES
3	7900	JAMES	7698	7698	BLAKE
4	7521	WARD	7698	7698	BLAKE
5	7844	TURNER	7698	7698	BLAKE
6	7499	ALLEN	7698	7698	BLAKE
7	7654	MARTIN	7698	7698	BLAKE
8	7934	MILLER	7782	7782	CLARK
9	7876	ADAMS	7788	7788	SCOTT
10	7698	BLAKE	7839	7839	KING
11	7782	CLARK	7839	7839	KING
12	7566	JONES	7839	7839	KING
13	7369	SMITH	7902	7902	FORD

```
SELECT E1.EMPNO, E1.ENAME, E1.MGR,  
       E2.EMPNO AS MGR_EMPNO,  
       E2.ENAME AS MGR_ENAME  
FROM EMP E1, EMP E2  
WHERE E1.MGR = E2.EMPNO;
```

Q009

- EMP테이블을 2번 이용하여

1. 직원정보(EMPNO, ENAME, MGR) 와 직속상관(EMPNO, ENAME)의 직원번호를 다음과 같이 출력하시오
2. 직속상관이 없는 직원의 정보도 출력하시오

	EMPNO	ENAME	MGR	MGR_EMPNO	MGR_ENAME
1	7369	SMITH	7902	7902	FORD
2	7499	ALLEN	7698	7698	BLAKE
3	7521	WARD	7698	7698	BLAKE
4	7566	JONES	7839	7839	KING
5	7654	MARTIN	7698	7698	BLAKE
6	7698	BLAKE	7839	7839	KING
7	7782	CLARK	7839	7839	KING
8	7788	SCOTT	7566	7566	JONES
9	7839	KING	(null)	(null)	(null)
10	7844	TURNER	7698	7698	BLAKE
11	7876	ADAMS	7788	7788	SCOTT
12	7900	JAMES	7698	7698	BLAKE
13	7902	FORD	7566	7566	JONES
14	7934	MILLER	7782	7782	CLARK

```
SELECT E1.EMPNO, E1.ENAME, E1.MGR,
       E2.EMPNO AS MGR_EMPNO,
       E2.ENAME AS MGR_ENAME
FROM EMP E1, EMP E2
WHERE E1.MGR = E2.EMPNO(+)
ORDER BY E1.EMPNO;
```

Q010

- (+)의 위치를 바꿔서 출력해보고 다음이 의미하는 바를 적으시오

	EMPNO	ENAME	MGR	MGR_EMPNO	MGR_ENAME
1	7369	SMITH	7902	7902	FORD
2	7499	ALLEN	7698	7698	BLAKE
3	7521	WARD	7698	7698	BLAKE
4	7566	JONES	7839	7839	KING
5	7654	MARTIN	7698	7698	BLAKE
6	7698	BLAKE	7839	7839	KING
7	7782	CLARK	7839	7839	KING
8	7788	SCOTT	7566	7566	JONES
9	7844	TURNER	7698	7698	BLAKE
10	7876	ADAMS	7788	7788	SCOTT
11	7900	JAMES	7698	7698	BLAKE
12	7902	FORD	7566	7566	JONES
13	7934	MILLER	7782	7782	CLARK
14	(null)	(null)	(null)	7934	MILLER
15	(null)	(null)	(null)	7844	TURNER
16	(null)	(null)	(null)	7876	ADAMS
17	(null)	(null)	(null)	7900	JAMES
18	(null)	(null)	(null)	7369	SMITH
19	(null)	(null)	(null)	7654	MARTIN
20	(null)	(null)	(null)	7521	WARD
21	(null)	(null)	(null)	7499	ALLEN

```

SELECT E1.EMPNO, E1.ENAME, E1.MGR,
       E2.EMPNO AS MGR_EMPNO,
       E2.ENAME AS MGR_ENAME
FROM EMP E1, EMP E2
WHERE E1.MGR(+) = E2.EMPNO
ORDER BY E1.EMPNO;

```

Q011 표준문법 (NATURAL JOIN)

- EMP , DEPT 테이블 이용하여
EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM를 다음과 같이 출력하시오

1. NATURAL JOIN

- 알아서 두 테이블의 이름과 자료형이 같은 열을 찾은 후
- 그 열을 기준으로 등가조인을 해주는 방식

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO	DNAME	LOC
1	7782	CLARK	MANAGER	7839	81/05/09	2450	(null)	10	ACCOUNTING	NEW YORK
2	7839	KING	PRESIDENT	(null)	81/11/17	5000	(null)	10	ACCOUNTING	NEW YORK
3	7934	MILLER	CLERK	7782	82/01/11	1300	(null)	10	ACCOUNTING	NEW YORK
4	7369	SMITH	CLERK	7902	80/12/09	800	(null)	20	RESEARCH	DALLAS
5	7566	JONES	MANAGER	7839	81/04/01	2975	(null)	20	RESEARCH	DALLAS
6	7788	SCOTT	ANALYST	7566	82/12/22	3000	(null)	20	RESEARCH	DALLAS
7	7876	ADAMS	CLERK	7788	83/01/15	1100	(null)	20	RESEARCH	DALLAS
8	7902	FORD	ANALYST	7566	81/12/11	3000	(null)	20	RESEARCH	DALLAS
9	7499	ALLEN	SALESMAN	7698	81/02/11	1600	300	30	SALES	CHICAGO
10	7521	WARD	SALESMAN	7698	81/02/23	1250	500	30	SALES	CHICAGO
11	7654	MARTIN	SALESMAN	7698	81/09/10	1250	1400	30	SALES	CHICAGO
12	7698	BLAKE	MANAGER	7839	81/05/01	2850	(null)	30	SALES	CHICAGO
13	7844	TURNER	SALESMAN	7698	81/08/21	1500	0	30	SALES	CHICAGO
14	7900	JAMES	CLERK	7698	81/12/11	950	(null)	30	SALES	CHICAGO

```

SELECT E.EMPNO, E.ENAME, E.JOB, E.MGR, E.HIREDATE, E.SAL, E.COMM,
       DEPTNO, D.DNAME, D.LOC
FROM EMP E NATURAL JOIN DEPT D
ORDER BY DEPTNO, E.EMPNO;

```

Q012 표준문법 (JOIN USING)

- EMP , DEPT 테이블 이용하여
EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM를 다음과 같이 출력하시오

1. JOIN USING

- USING에 조인기준열 명시
- 그 열을 기준으로 등가조인을 해주는 방식

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO	DNAME	LOC
1	7839	KING	PRESIDENT	(null)	81/11/17	5000	(null)	10	ACCOUNTING	NEW YORK
2	7788	SCOTT	ANALYST	7566	82/12/22	3000	(null)	20	RESEARCH	DALLAS
3	7902	FORD	ANALYST	7566	81/12/11	3000	(null)	20	RESEARCH	DALLAS

```

SELECT E.EMPNO, E.ENAME, E.JOB, E.MGR, E.HIREDATE, E.SAL, E.COMM,
       DEPTNO, D.DNAME, D.LOC
FROM EMP E JOIN DEPT D USING (DEPTNO)
WHERE SAL >= 3000
ORDER BY DEPTNO, E.EMPNO;

```

Q013 표준문법 (JOIN ON)

- EMP , DEPT 테이블 이용하여
EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM를 다음과 같이 출력하시오

1. JOIN ON

- ON에 조인기준열 명시
- 그 열을 기준으로 등가조인을 해주는 방식

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO	DNAME	LOC
1	7782	CLARK	MANAGER	7839	81/05/09	2450	(null)	10	ACCOUNTING	NEW YORK
2	7934	MILLER	CLERK	7782	82/01/11	1300	(null)	10	ACCOUNTING	NEW YORK
3	7369	SMITH	CLERK	7902	80/12/09	800	(null)	20	RESEARCH	DALLAS
4	7566	JONES	MANAGER	7839	81/04/01	2975	(null)	20	RESEARCH	DALLAS
5	7788	SCOTT	ANALYST	7566	82/12/22	3000	(null)	20	RESEARCH	DALLAS
6	7876	ADAMS	CLERK	7788	83/01/15	1100	(null)	20	RESEARCH	DALLAS
7	7902	FORD	ANALYST	7566	81/12/11	3000	(null)	20	RESEARCH	DALLAS
8	7499	ALLEN	SALESMAN	7698	81/02/11	1600	300	30	SALES	CHICAGO
9	7521	WARD	SALESMAN	7698	81/02/23	1250	500	30	SALES	CHICAGO
10	7654	MARTIN	SALESMAN	7698	81/09/10	1250	1400	30	SALES	CHICAGO
11	7698	BLAKE	MANAGER	7839	81/05/01	2850	(null)	30	SALES	CHICAGO
12	7844	TURNER	SALESMAN	7698	81/08/21	1500	0	30	SALES	CHICAGO
13	7900	JAMES	CLERK	7698	81/12/11	950	(null)	30	SALES	CHICAGO

```

SELECT E.EMPNO, E.ENAME, E.JOB, E.MGR, E.HIREDATE, E.SAL, E.COMM,
       E.DEPTNO,
       D.DNAME, D.LOC
FROM EMP E JOIN DEPT D ON (E.DEPTNO = D.DEPTNO)
WHERE SAL <= 3000
ORDER BY E.DEPTNO, EMPNO;

```

Q014 표준문법 (LEFT OUTER JOIN)

- EMP , DEPT 테이블 이용하여 다음과 같이 출력하시오

1. LEFT OUTER JOIN

- 왼쪽 외부조인을 기준으로 NULL보장

	EMPNO	ENAME	MGR	MGR_EMPNO	MGR_ENAME
1	7369	SMITH	7902	7902	FORD
2	7499	ALLEN	7698	7698	BLAKE
3	7521	WARD	7698	7698	BLAKE
4	7566	JONES	7839	7839	KING
5	7654	MARTIN	7698	7698	BLAKE
6	7698	BLAKE	7839	7839	KING
7	7782	CLARK	7839	7839	KING
8	7788	SCOTT	7566	7566	JONES
9	7839	KING	(null)	(null)	(null)
10	7844	TURNER	7698	7698	BLAKE
11	7876	ADAMS	7788	7788	SCOTT
12	7900	JAMES	7698	7698	BLAKE
13	7902	FORD	7566	7566	JONES
14	7934	MILLER	7782	7782	CLARK

```

SELECT E1.EMPNO, E1.ENAME, E1.MGR,
       E2.EMPNO AS MGR_EMPNO,
       E2.ENAME AS MGR_ENAME
FROM EMP E1 LEFT OUTER JOIN EMP E2 ON (E1.MGR = E2.EMPNO)
ORDER BY E1.EMPNO;

```

Q015 표준문법 (RIGHT OUTER JOIN)

- EMP , DEPT 테이블 이용하여 다음과 같이 출력하시오
1. RIGHT OUTER JOIN
- 오른쪽 외부조인을 기준으로 NULL보장

	EMPNO	ENAME	MGR	MGR_EMPNO	MGR_ENAME
1	7369	SMITH	7902	7902	FORD
2	7499	ALLEN	7698	7698	BLAKE
3	7521	WARD	7698	7698	BLAKE
4	7566	JONES	7839	7839	KING
5	7654	MARTIN	7698	7698	BLAKE
6	7698	BLAKE	7839	7839	KING
7	7782	CLARK	7839	7839	KING
8	7788	SCOTT	7566	7566	JONES
9	7844	TURNER	7698	7698	BLAKE
10	7876	ADAMS	7788	7788	SCOTT
11	7900	JAMES	7698	7698	BLAKE
12	7902	FORD	7566	7566	JONES
13	7934	MILLER	7782	7782	CLARK
14	(null)	(null)	(null)	7369	SMITH
15	(null)	(null)	(null)	7499	ALLEN
16	(null)	(null)	(null)	7521	WARD
17	(null)	(null)	(null)	7654	MARTIN
18	(null)	(null)	(null)	7844	TURNER
19	(null)	(null)	(null)	7876	ADAMS
20	(null)	(null)	(null)	7900	JAMES
21	(null)	(null)	(null)	7934	MILLER

```

SELECT E1.EMPNO, E1.ENAME, E1.MGR,
       E2.EMPNO AS MGR_EMPNO,
       E2.ENAME AS MGR_ENAME
FROM EMP E1 RIGHT OUTER JOIN EMP E2 ON (E1.MGR = E2.EMPNO)
ORDER BY E1.EMPNO, MGR_EMPNO;

```

Q016 표준문법 (FULL OUTER JOIN)

- EMP , DEPT 테이블 이용하여 다음과 같이 출력하시오

1. FULL OUTER JOIN

- 양쪽모두두 외부조인을 기준으로 NULL보장

	EMPNO	ENAME	MGR	MGR_EMPNO	MGR_ENAME
1	7369	SMITH	7902	7902	FORD
2	7499	ALLEN	7698	7698	BLAKE
3	7521	WARD	7698	7698	BLAKE
4	7566	JONES	7839	7839	KING
5	7654	MARTIN	7698	7698	BLAKE
6	7698	BLAKE	7839	7839	KING
7	7782	CLARK	7839	7839	KING
8	7788	SCOTT	7566	7566	JONES
9	7839	KING	(null)	(null)	(null)
10	7844	TURNER	7698	7698	BLAKE
11	7876	ADAMS	7788	7788	SCOTT
12	7900	JAMES	7698	7698	BLAKE
13	7902	FORD	7566	7566	JONES
14	7934	MILLER	7782	7782	CLARK
15	(null)	(null)	(null)	7900	JAMES
16	(null)	(null)	(null)	7521	WARD
17	(null)	(null)	(null)	7654	MARTIN
18	(null)	(null)	(null)	7499	ALLEN
19	(null)	(null)	(null)	7876	ADAMS
20	(null)	(null)	(null)	7934	MILLER
21	(null)	(null)	(null)	7844	TURNER
22	(null)	(null)	(null)	7369	SMITH

```

SELECT E1.EMPNO, E1.ENAME, E1.MGR,
       E2.EMPNO AS MGR_EMPNO,
       E2.ENAME AS MGR_ENAME
FROM EMP E1 FULL OUTER JOIN EMP E2 ON (E1.MGR = E2.EMPNO)
ORDER BY E1.EMPNO;

```

■STEP2. EX

EX001

- EMP, DEPT 테이블을 이용하여
SQL-99 이전 방식다음 , SQL-99방식 두가지 방식으로 다음과 같이 출력하시오.

1. 급여(SAL)이 2000초과인 직원들의 부서정보, 직원정보를 출력하시오.

SQL-99 이전 방식

	DEPTNO	DNAME	EMPNO	ENAME	SAL
1	10	ACCOUNTING	7839	KING	5000
2	10	ACCOUNTING	7782	CLARK	2450
3	20	RESEARCH	7788	SCOTT	3000
4	20	RESEARCH	7566	JONES	2975
5	20	RESEARCH	7902	FORD	3000
6	30	SALES	7698	BLAKE	2850

SQL-99방식

	DEPTNO	DNAME	EMPNO	ENAME	SAL
1	10	ACCOUNTING	7839	KING	5000
2	10	ACCOUNTING	7782	CLARK	2450
3	20	RESEARCH	7788	SCOTT	3000
4	20	RESEARCH	7566	JONES	2975
5	20	RESEARCH	7902	FORD	3000
6	30	SALES	7698	BLAKE	2850

EX002

- EMP, DEPT 테이블을 이용하여 SQL-99 이전 방식다음 , SQL-99방식 두가지 방식으로 다음과 같이 출력하시오.
- 각 부서별 평균급여, 최대급여, 인원수를 출력하시오.

SQL-99 이전 방식

	DEPTNO	DNAME	AVG_SAL	MAX_SAL	MIN_SAL	CNT
1	10	ACCOUNTING	2916	5000	1300	3
2	20	RESEARCH	2175	3000	800	5
3	30	SALES	1566	2850	950	6

SQL-99 방식

	DEPTNO	DNAME	AVG_SAL	MAX_SAL	MIN_SAL	CNT
1	10	ACCOUNTING	2916	5000	1300	3
2	20	RESEARCH	2175	3000	800	5
3	30	SALES	1566	2850	950	6

EX003

- EMP, DEPT 테이블을 이용하여
SQL-99 이전 방식다음 , SQL-99방식 두가지 방식으로 다음과 같이 출력하시오.
- 모든 부서정보와 사원정보를 부서번호, 사원이름 순으로 정렬해 출력하시오.

SQL-99 이전 방식

	DEPTNO	DNAME	EMPNO	ENAME	JOB	SAL
1	10	ACCOUNTING	7782	CLARK	MANAGER	2450
2	10	ACCOUNTING	7839	KING	PRESIDENT	5000
3	10	ACCOUNTING	7934	MILLER	CLERK	1300
4	20	RESEARCH	7876	ADAMS	CLERK	1100
5	20	RESEARCH	7902	FORD	ANALYST	3000
6	20	RESEARCH	7566	JONES	MANAGER	2975
7	20	RESEARCH	7788	SCOTT	ANALYST	3000
8	20	RESEARCH	7369	SMITH	CLERK	800
9	30	SALES	7499	ALLEN	SALESMAN	1600
10	30	SALES	7698	BLAKE	MANAGER	2850
11	30	SALES	7900	JAMES	CLERK	950
12	30	SALES	7654	MARTIN	SALESMAN	1250
13	30	SALES	7844	TURNER	SALESMAN	1500
14	30	SALES	7521	WARD	SALESMAN	1250
15	40	OPERATIONS	(null)	(null)	(null)	(null)

SQL-99 방식

	DEPTNO	DNAME	EMPNO	ENAME	JOB	SAL
1	10	ACCOUNTING	7782	CLARK	MANAGER	2450
2	10	ACCOUNTING	7839	KING	PRESIDENT	5000
3	10	ACCOUNTING	7934	MILLER	CLERK	1300
4	20	RESEARCH	7876	ADAMS	CLERK	1100
5	20	RESEARCH	7902	FORD	ANALYST	3000
6	20	RESEARCH	7566	JONES	MANAGER	2975
7	20	RESEARCH	7788	SCOTT	ANALYST	3000
8	20	RESEARCH	7369	SMITH	CLERK	800
9	30	SALES	7499	ALLEN	SALESMAN	1600
10	30	SALES	7698	BLAKE	MANAGER	2850
11	30	SALES	7900	JAMES	CLERK	950
12	30	SALES	7654	MARTIN	SALESMAN	1250
13	30	SALES	7844	TURNER	SALESMAN	1500
14	30	SALES	7521	WARD	SALESMAN	1250
15	40	OPERATIONS	(null)	(null)	(null)	(null)

EX004

- EMP, DEPT 테이블을 이용하여

SQL-99 이전 방식다음 , SQL-99방식 두가지 방식으로 다음과 같이 출력하시오.

1. 모든 부서정보와 사원정보, 급여등급정보, 각사원의 직속상관의 정보를
2. 부서번호, 사원번호 순서로 정렬해 출력하시오.

SQL-99 이전 방식

[illegible]

SQL-99방식

[illegible]