데이터베이스 실습 4

실습 내용

- SQL 실행계획 확인

SQL 실행 계획 확인하기

scott 계정을 통하여 SQL 실행계획을 몇가지 확인해보겠습니다.

```
SQL> show user
USER is "SCOTT"
```

SQL 의 실행계획을 보는 가장 간단한 방법은 autotrace 라는 기능을 활용하는 것입니다.

아래와 같이 활성화가 가능합니다.

```
SQL> set autotrace on explain
```

한번 기본적인 쿼리의 실행계획을 보도록 하겠습니다.

```
SQL> 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

    EMPNO ENAME      JOB              MGR HIREDATE            SAL      COMM    DEPTNO
---------- ---------- --------- ---------- ----------------- ---------- ---------- ----------
     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
```

```
14 rows selected.


Execution Plan
----------------------------------------------------------
Plan hash value: 3956160932

--------------------------------------------------------------------------
| Id  | Operation         | Name | Rows  | Bytes | Cost (%CPU)| Time     |
--------------------------------------------------------------------------
|   0 | SELECT STATEMENT  |      |    14 |   532 |     2   (0)| 00:00:01 |
|   1 |  TABLE ACCESS FULL| EMP  |    14 |   532 |     2   (0)| 00:00:01 |
--------------------------------------------------------------------------
```

테이블 풀 스캔을 하여 데이터를 조회하는 것을 확인할 수 있습니다.

이번에는 간단한 DEPT 와의 조인구문을 통해 수행해 보겠습니다.

```
SQL> select e.empno, e.ename, e.job, d.dname from emp e, dept d where e.deptno =
d.deptno;

     EMPNO ENAME      JOB       DNAME
---------- ---------- --------- --------------
      7369 SMITH      CLERK     RESEARCH
      7499 ALLEN      SALESMAN  SALES
      7521 WARD       SALESMAN  SALES
      7566 JONES      MANAGER   RESEARCH
      7654 MARTIN     SALESMAN  SALES
      7698 BLAKE      MANAGER   SALES
      7782 CLARK      MANAGER   ACCOUNTING
      7788 SCOTT      ANALYST   RESEARCH
      7839 KING       PRESIDENT ACCOUNTING
      7844 TURNER     SALESMAN  SALES
      7876 ADAMS      CLERK     RESEARCH

     EMPNO ENAME      JOB       DNAME
---------- ---------- --------- --------------
      7900 JAMES      CLERK     SALES
      7902 FORD       ANALYST   RESEARCH
      7934 MILLER     CLERK     ACCOUNTING

14 rows selected.


Execution Plan
----------------------------------------------------------
Plan hash value: 615168685
```

```
-------------------------------------------------------------------------
| Id  | Operation          | Name | Rows  | Bytes | Cost (%CPU)| Time     |
-------------------------------------------------------------------------
|   0 | SELECT STATEMENT   |      |    14 |   476 |     5  (20)| 00:00:01 |
|*  1 |  HASH JOIN         |      |    14 |   476 |     5  (20)| 00:00:01 |
|   2 |   TABLE ACCESS FULL| DEPT |     4 |    52 |     2   (0)| 00:00:01 |
|   3 |   TABLE ACCESS FULL| EMP  |    14 |   294 |     2   (0)| 00:00:01 |
-------------------------------------------------------------------------

Predicate Information (identified by operation id):
---------------------------------------------------

   1 - access("E"."DEPTNO"="D"."DEPTNO")
```

두 테이블을 완전히 스캔한 후 연산을 수행하는 것을 확인할 수 있습니다.

조금 더 복잡한 쿼리를 수행해 보겠습니다. 이번에는 직원의 사번과 이름, 매니저, 부서를 함께 출력해보겠습니다. **(본 쿼리의 실행계획을 캡쳐하여 첨부하십시오 – 문제 5)**

```
SQL> select ee.empno, ee.ename, ee.job, d.dname, em.ename from emp ee, emp em,
dept d where ee.deptno = d.deptno and ee.mgr = em.empno;

    EMPNO ENAME      JOB       DNAME          ENAME
---------- ---------- --------- -------------- ----------
     7902 FORD       ANALYST   RESEARCH       JONES
     7788 SCOTT      ANALYST   RESEARCH       JONES
     7900 JAMES      CLERK     SALES          BLAKE
     7844 TURNER     SALESMAN  SALES          BLAKE
     7654 MARTIN     SALESMAN  SALES          BLAKE
     7521 WARD       SALESMAN  SALES          BLAKE
     7499 ALLEN      SALESMAN  SALES          BLAKE
     7934 MILLER     CLERK     ACCOUNTING     CLARK
     7876 ADAMS      CLERK     RESEARCH       SCOTT
     7782 CLARK      MANAGER   ACCOUNTING     KING
     7698 BLAKE      MANAGER   SALES          KING

    EMPNO ENAME      JOB       DNAME          ENAME
---------- ---------- --------- -------------- ----------
     7566 JONES      MANAGER   RESEARCH       KING
     7369 SMITH      CLERK     RESEARCH       FORD

13 rows selected.


Execution Plan
----------------------------------------------------------
Plan hash value: 453895177
```

```
-------------------------------------------------------------------------
| Id  | Operation          | Name | Rows  | Bytes | Cost (%CPU)| Time     |
-------------------------------------------------------------------------
|  0 | SELECT STATEMENT   |      |   13 |   624 |     7  (15)| 00:00:01 |
|* 1 |  HASH JOIN         |      |   13 |   624 |     7  (15)| 00:00:01 |
|* 2 |   HASH JOIN        |      |   13 |   494 |     5  (20)| 00:00:01 |
|  3 |    TABLE ACCESS FULL| DEPT |    4 |    52 |     2   (0)| 00:00:01 |
|* 4 |    TABLE ACCESS FULL| EMP  |   13 |   325 |     2   (0)| 00:00:01 |
|  5 |   TABLE ACCESS FULL | EMP  |   14 |   140 |     2   (0)| 00:00:01 |
-------------------------------------------------------------------------

Predicate Information (identified by operation id):
---------------------------------------------------

  1 - access("EE"."MGR"="EM"."EMPNO")
  2 - access("EE"."DEPTNO"="D"."DEPTNO")
  4 - filter("EE"."MGR" IS NOT NULL)
```

(예시)

```
Execution Plan
----------------------------------------------------------
Plan hash value: 453895177

-------------------------------------------------------------------------------------
| Id  | Operation           | Name | Rows  | Bytes | Cost (%CPU)| Time     |
-------------------------------------------------------------------------------------
|   0 | SELECT STATEMENT    |      |    13 |   624 |     7  (15)| 00:00:01 |
|*  1 |  HASH JOIN          |      |    13 |   624 |     7  (15)| 00:00:01 |
|*  2 |   HASH JOIN         |      |    13 |   494 |     5  (20)| 00:00:01 |
|   3 |    TABLE ACCESS FULL| DEPT |     4 |    52 |     2   (0)| 00:00:01 |
|*  4 |    TABLE ACCESS FULL| EMP  |    13 |   325 |     2   (0)| 00:00:01 |
|   5 |   TABLE ACCESS FULL | EMP  |    14 |   140 |     2   (0)| 00:00:01 |
-------------------------------------------------------------------------------------

Predicate Information (identified by operation id):
---------------------------------------------------

   1 - access("EE"."MGR"="EM"."EMPNO")
   2 - access("EE"."DEPTNO"="D"."DEPTNO")
   4 - filter("EE"."MGR" IS NOT NULL)

PROF>
```