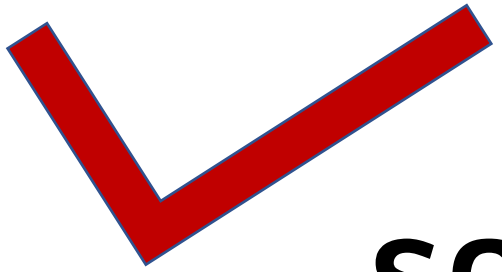
이럴 때는



SQL을 재작성해서 튜닝하세요. 첫번째!

▣ 학습 내용

1. SQL 재작성하는 튜닝의 필요성에 대해서 학습합니다.

2. 악성 SQL을 분석하여 왜 튜닝이 필요한지 이해합니다.

3. ChatGPT 를 활용하여 악성 SQL 튜닝하는 방법을 학습합니다.

▣ 학습 목표

데이터 분석함수로 SQL을 재작성하여 튜닝할 수 있게 됩니다.

▣ SQL 재작성 튜닝이 필요한 이유

1. 힌트 만으로는 성능이 더이상 좋아지지 않는 SQL 일때

2. 같은 데이터가 있는 다른 테이블을 선택하는게 더 바람직할 때

3. 같은 결과가 나오는 더 좋은 SQL이 있을 때

튜닝전 :

```
select decode(no,1, deptno, 2, null) as deptno, sum(sal)
    from emp e, ( select rownum no
                  from dual
                  connect by level <= 2 ) d
group by decode(no, 1, deptno, 2, null )
order by deptno;
```

emp 테이블

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7839	KING	PRESIDENT		1981-11-17	5000		10
7698	BLAKE	MANAGER	7839	1981-05-01	2850		30
7782	CLARK	MANAGER	7839	1981-05-09	2450		10
7566	JONES	MANAGER	7839	1981-04-01	2975		20
7654	MARTIN	SALESMAN	7698	1981-09-10	1250	1400	30
7499	ALLEN	SALESMAN	7698	1981-02-11	1600	300	30
7844	TURNER	SALESMAN	7698	1981-08-21	1500	0	30
7900	JAMES	CLERK	7698	1981-12-11	950		30
7521	WARD	SALESMAN	7698	1981-02-23	1250	500	30
7902	FORD	ANALYST	7566	1981-12-11	3000		20
7369	SMITH	CLERK	7902	1980-12-09	800		20
7788	SCOTT	ANALYST	7566	1982-12-22	3000		20
7876	ADAMS	CLERK	7788	1983-01-15	1100		20
7934	MILLER	CLERK	7782	1982-01-11	1300		10

출력결과

DEPTNO	SUM(SAL)
10	8750
20	10875
30	9400
	29025

튜닝전 :

```
select  decode(no,1, deptno, 2, null)  as deptno, sum(sal)
      from  emp  e,  ( select  rownum  no
                       from  dual
                       connect  by level <= 2 )  v
group  by  decode(no, 1, deptno, 2, null )
order by deptno;
```

악성 SQL분석을 통해 SQL 튜닝 스킬을 향상 시키세요 !

출력결과

DEPTNO	SUM(SAL)
10	8750
20	10875
30	9400
	29025

튜닝전:

```
select  deptno, sal, no
   from  emp  e,  ( select  rownum  no
                    from  dual
                    connect  by level <= 2 )  v
```

emp 테이블

DEPTNO	SAL
10	5000
30	2850
10	2450
20	2975
30	1250
30	1600
30	1500
30	950
30	1250
20	3000
20	800
20	3000
20	1100
10	1300

In line view

NO
1
2

출력결과

DEPTNO	SAL	NO
10	5000	1
30	2850	1
10	2450	1
20	2975	1
30	1250	1
30	1600	1
30	1500	1
30	950	1
30	1250	1
20	3000	1
20	800	1
20	3000	1
20	1100	1
10	1300	1
10	5000	2
30	2850	2
10	2450	2
20	2975	2
30	1250	2
30	1600	2
30	1500	2
30	950	2
30	1250	2
20	3000	2
20	800	2
20	3000	2
20	1100	2
10	1300	2

튜닝전:

```
select  decode(no,1,deptno,2, null) as deptno, sal, no
   from  emp  e,  ( select  rownum  no
                    from  dual
                    connect  by level <= 2 )  v
```

emp 테이블

DEPTNO	SAL
10	5000
30	2850
10	2450
20	2975
30	1250
30	1600
30	1500
30	950
30	1250
20	3000
20	800
20	3000
20	1100
10	1300

In line view

NO
1
2

출력결과

DEPTNO	SAL	NO
10	5000	1
30	2850	1
10	2450	1
20	2975	1
30	1250	1
30	1600	1
30	1500	1
30	950	1
30	1250	1
20	3000	1
20	800	1
20	3000	1
20	1100	1
10	1300	1
null	5000	2
null	2850	2
null	2450	2
null	2975	2
null	1250	2
null	1600	2
null	1500	2
null	950	2
null	1250	2
null	3000	2
null	800	2
null	3000	2
null	1100	2
null	1300	2

튜닝전:

```
select  decode(no,1,deptno,2, null) as deptno, sum(sal)
  from  emp  e,  ( select  rownum  no
                   from  dual
                   connect  by level <= 2 )  v
 group  by  decode(no,1,deptno,2,null) ;
```

emp 테이블

SAL	DEPTNO
5000	10
2850	30
2450	10
2975	20
1250	30
1600	30
1500	30
950	30
1250	30
3000	20
800	20
3000	20
1100	20
1300	10

In line view

NO
1
2

DEPTNO	SAL	NO
10	5000	1
30	2850	1
10	2450	1
20	2975	1
30	1250	1
30	1600	1
30	1500	1
30	950	1
30	1250	1
20	3000	1
20	800	1
20	3000	1
20	1100	1
10	1300	1
null	5000	2
null	2850	2
null	2450	2
null	2975	2
null	1250	2
null	1600	2
null	1500	2
null	950	2
null	1250	2
null	3000	2
null	800	2
null	3000	2
null	1100	2
null	1300	2

출력결과

DEPTNO	SUM(SAL)
10	8750
20	10875
30	9400
	29025

튜닝전 :

```
select  decode(no,1, deptno, 2, null)  as deptno, sum(sal)
      from  emp  e,  ( select  rownum  no
                       from  dual
                       connect  by level <= 2 )  v
group  by  decode(no, 1, deptno, 2, null )
order by deptno;
```

튜닝후 :

```
select  deptno, sum(sal)
    from  emp
    group  by  rollup(deptno)
    order  by  deptno asc;
```

출력결과

DEPTNO	SUM(SAL)
10	8750
20	10875
30	9400
	29025

rollup을 안썼을 때 :

```
select  deptno, sum(sal)
     from  emp
     group  by  deptno
     order  by  deptno asc;
```

출력결과

DEPTNO	SUM(SAL)
10	8750
20	10875
30	9400

rollup을 썼을 때 :

```
select  deptno, sum(sal)
     from  emp
     group  by  rollup(deptno)
     order  by  deptno asc;
```

출력결과

DEPTNO	SUM(SAL)
10	8750
20	10875
30	9400
	29025

튜닝전 :

```
select  decode(no,1, deptno, 2, null)  as deptno, sum(sal)
        from  emp  e,  ( select  rownum  no
                                 from  dual
                                 connect  by level <= 2 )  v
        group  by  decode(no, 1, deptno, 2, null )
        order by deptno;
```

Id	Operation	Name	Starts	E-Rows	A-Rows	A-Time	Buffers	OMem	1Mem	Used-Mem
0	SELECT STATEMENT		1		4	00:00:00.01	7			
1	SORT GROUP BY		1	3	4	00:00:00.01	7	2048	2048	2048 (0)
2	MERGE JOIN CARTESIAN		1	14	28	00:00:00.01	7			
3	VIEW		1	1	2	00:00:00.01	0			
4	COUNT		1		2	00:00:00.01	0			
5	CONNECT BY WITHOUT FILTERING		1		2	00:00:00.01	0	2048	2048	2048 (0)
6	FAST DUAL		1	1	1	00:00:00.01	0			
7	BUFFER SORT		2	14	28	00:00:00.01	7	2048	2048	2048 (0)
8	TABLE ACCESS FULL	EMP	1	14	14	00:00:00.01	7			

튜닝후

```
select  deptno, sum(sal)
    from  emp
    group  by  rollup(deptno)
    order  by  deptno asc;
```

```
-------------------------------------------------------------------------------------------------------------
| Id  | Operation           | Name | Starts | E-Rows | A-Rows |   A-Time   | Buffers |  OMem |  1Mem | Used-Mem |
-------------------------------------------------------------------------------------------------------------
|   0 | SELECT STATEMENT    |      |      1 |        |      4 |00:00:00.01 |       6 |       |       |          |
|   1 |  SORT GROUP BY ROLLUP|      |      1 |      3 |      4 |00:00:00.01 |       6 |  2048 |  2048 | 2048  (0)|
|   2 |   TABLE ACCESS FULL  | EMP  |      1 |     14 |     14 |00:00:00.01 |       6 |       |       |          |
-------------------------------------------------------------------------------------------------------------
```