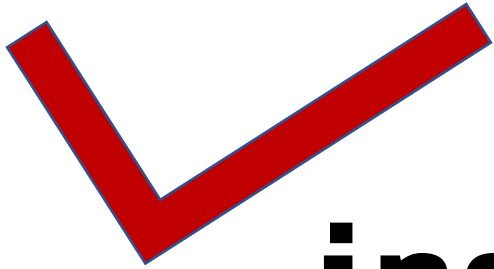이럴때는 ✓

index skip scan 으로 유도하자 !

index skip scan 이란 ?

인덱스 스킵 스캔은 결합 컬럼 인덱스의 첫 번째 컬럼이 WHERE 조건에 존재하지 않아도 인덱스를 이용할 수 있는 인덱스 액세스 방식

	인덱스 엑세스 방법	관련 힌트
1	index range scan	index
2	index unique scan	index
3	index full scan	index
4	index skip scan	index_ss
5	index fast full scan	index_ffs
6	index merge scan	and_equal
7	index bitmap merge scan	index_combine

결합 컬럼 인덱스의 첫번째 컬럼이 where 절에 없을 때

- 결합 컬럼 인덱스의 첫번째 컬럼이 where 절에 없다면 full table scan 으로 실행계획이 수행됩니다.

- 결합 컬럼 인덱스가 select 절에서 사용되기 위해서는 결합 컬럼 인덱스의 첫번째 컬럼이 where 절에 검색조건 으로 있어야 합니다.

create index emp_deptno_job
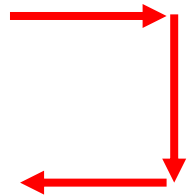## on emp(deptno,job);

emp_deptno_job 인덱스

DEPTNO	JOB	ROWID
10	CLERK	AAAW+FAAHAAAAK1AAN
10	MANAGER	AAAW+FAAHAAAAK1AAC
10	PRESIDENT	AAAW+FAAHAAAAK1AAA
20	ANALYST	AAAW+FAAHAAAAK1AAJ
20	ANALYST	AAAW+FAAHAAAAK1AAL
20	CLERK	AAAW+FAAHAAAAK1AAK
20	CLERK	AAAW+FAAHAAAAK1AAM
20	MANAGER	AAAW+FAAHAAAAK1AAD
30	CLERK	AAAW+FAAHAAAAK1AAH
30	MANAGER	AAAW+FAAHAAAAK1AAB
30	SALESMAN	AAAW+FAAHAAAAK1AAE
30	SALESMAN	AAAW+FAAHAAAAK1AAF
30	SALESMAN	AAAW+FAAHAAAAK1AAG
30	SALESMAN	AAAW+FAAHAAAAK1AAI

emp 테이블

ROWID	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
AAATc1AAHAAAAHeAAA	7839	KING	PRESIDENT		1981-11-17	5000		10
AAATc1AAHAAAAHeAAB	7698	BLAKE	MANAGER	7839	1981-05-01	2850		30
AAATc1AAHAAAAHeAAC	7782	CLARK	MANAGER	7839	1981-05-09	2450		10
AAATc1AAHAAAAHeAAD	7566	JONES	MANAGER	7839	1981-04-01	2975		20
AAATc1AAHAAAAHeAAE	7654	MARTIN	SALESMAN	7698	1981-09-10	1250	1400	30
AAATc1AAHAAAAHeAAF	7499	ALLEN	SALESMAN	7698	1981-02-11	1600	300	30
AAATc1AAHAAAAHeAAG	7844	TURNER	SALESMAN	7698	1981-08-21	1500	0	30
AAATc1AAHAAAAHeAAH	7900	JAMES	CLERK	7698	1981-12-11	950		30
AAATc1AAHAAAAHeAAI	7521	WARD	SALESMAN	7698	1981-02-23	1250	500	30
AAATc1AAHAAAAHeAAJ	7902	FORD	ANALYST	7566	1981-12-11	3000		20
AAATc1AAHAAAAHeAAK	7369	SMITH	CLERK	7902	1980-12-09	800		20
AAATc1AAHAAAAHeAAL	7788	SCOTT	ANALYST	7566	1982-12-22	3000		20
AAATc1AAHAAAAHeAAM	7876	ADAMS	CLERK	7788	1983-01-15	1100		20
AAATc1AAHAAAAHeAAN	7934	MILLER	CLERK	7782	1982-01-11	1300		10

select /*+ index(emp emp_deptno_job) */ ename,deptno, job
from emp
where deptno = 10 and job ='MANAGER';

emp_deptno_job 인덱스   **index range scan !**   **emp 테이블**

DEPTNO	JOB	ROWID
10	CLERK	AAAXAaAANAAAAE9AAN
10	MANAGER	AAAXAaAANAAAAE9AAC
10	PRESIDENT	AAAXAaAANAAAAE9AAA
20	ANALYST	AAAXAaAANAAAAE9AAJ
20	ANALYST	AAAXAaAANAAAAE9AAL
20	CLERK	AAAXAaAANAAAAE9AAK
20	CLERK	AAAXAaAANAAAAE9AAM
20	MANAGER	AAAXAaAANAAAAE9AAD
30	CLERK	AAAXAaAANAAAAE9AAH
30	MANAGER	AAAXAaAANAAAAE9AAB
30	SALESMAN	AAAXAaAANAAAAE9AAE
30	SALESMAN	AAAXAaAANAAAAE9AAF
30	SALESMAN	AAAXAaAANAAAAE9AAG
30	SALESMAN	AAAXAaAANAAAAE9AAI

ROWID	EMPNO	ENAME	JOB	MGR	…
AAATc1AAHAAAAHeAAA	7839	KING	PRESIDENT		…
AAATc1AAHAAAAHeAAB	7698	BLAKE	MANAGER	7839	…
AAATc1AAHAAAAHeAAC	7782	CLARK	MANAGER	7839	…
AAATc1AAHAAAAHeAAD	7566	JONES	MANAGER	7839	…
AAATc1AAHAAAAHeAAE	7654	MARTIN	SALESMAN	7698	…
AAATc1AAHAAAAHeAAF	7499	ALLEN	SALESMAN	7698	…
AAATc1AAHAAAAHeAAG	7844	TURNER	SALESMAN	7698	…
AAATc1AAHAAAAHeAAH	7900	JAMES	CLERK	7698	…
AAATc1AAHAAAAHeAAI	7521	WARD	SALESMAN	7698	…
AAATc1AAHAAAAHeAAJ	7902	FORD	ANALYST	7566	…
AAATc1AAHAAAAHeAAK	7369	SMITH	CLERK	7902	…
AAATc1AAHAAAAHeAAL	7788	SCOTT	ANALYST	7566	…
AAATc1AAHAAAAHeAAM	7876	ADAMS	CLERK	7788	…
AAATc1AAHAAAAHeAAN	7934	MILLER	CLERK	7782	…

select ename,deptno, job
from emp
where job ='MANAGER';

full table scan !

emp_deptno_job 인덱스

DEPTNO	JOB	ROWID
10	CLERK	AAAW+FAAHAAAAK1AAN
10	MANAGER	AAAW+FAAHAAAAK1AAC
10	PRESIDENT	AAAW+FAAHAAAAK1AAA
20	ANALYST	AAAW+FAAHAAAAK1AAJ
20	ANALYST	AAAW+FAAHAAAAK1AAL
20	CLERK	AAAW+FAAHAAAAK1AAK
20	CLERK	AAAW+FAAHAAAAK1AAM
20	MANAGER	AAAW+FAAHAAAAK1AAD
30	CLERK	AAAW+FAAHAAAAK1AAH
30	MANAGER	AAAW+FAAHAAAAK1AAB
30	SALESMAN	AAAW+FAAHAAAAK1AAE
30	SALESMAN	AAAW+FAAHAAAAK1AAF
30	SALESMAN	AAAW+FAAHAAAAK1AAG
30	SALESMAN	AAAW+FAAHAAAAK1AAI

emp 테이블

ROWID	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
AAATc1AAHAAAAHeAAA	7839	KING	PRESIDENT		1981-11-17	5000		10
AAATc1AAHAAAAHeAAB	7698	BLAKE	MANAGER	7839	1981-05-01	2850		30
AAATc1AAHAAAAHeAAC	7782	CLARK	MANAGER	7839	1981-05-09	2450		10
AAATc1AAHAAAAHeAAD	7566	JONES	MANAGER	7839	1981-04-01	2975		20
AAATc1AAHAAAAHeAAE	7654	MARTIN	SALESMAN	7698	1981-09-10	1250	1400	30
AAATc1AAHAAAAHeAAF	7499	ALLEN	SALESMAN	7698	1981-02-11	1600	300	30
AAATc1AAHAAAAHeAAG	7844	TURNER	SALESMAN	7698	1981-08-21	1500	0	30
AAATc1AAHAAAAHeAAH	7900	JAMES	CLERK	7698	1981-12-11	950		30
AAATc1AAHAAAAHeAAI	7521	WARD	SALESMAN	7698	1981-02-23	1250	500	30
AAATc1AAHAAAAHeAAJ	7902	FORD	ANALYST	7566	1981-12-11	3000		20
AAATc1AAHAAAAHeAAK	7369	SMITH	CLERK	7902	1980-12-09	800		20
AAATc1AAHAAAAHeAAL	7788	SCOTT	ANALYST	7566	1982-12-22	3000		20
AAATc1AAHAAAAHeAAM	7876	ADAMS	CLERK	7788	1983-01-15	1100		20
AAATc1AAHAAAAHeAAN	7934	MILLER	CLERK	7782	1982-01-11	1300		10

select /*+ index_ss(emp emp_deptno_job) */ ename,deptno, job
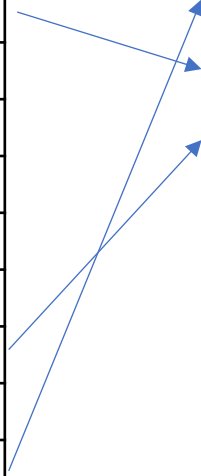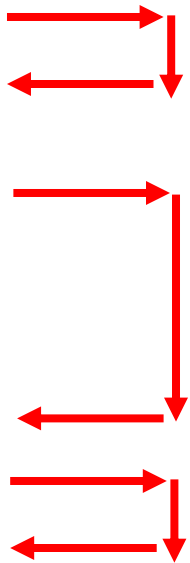## from emp
where job ='MANAGER';

index skip scan !

emp_deptno_job 인덱스

DEPTNO	JOB	ROWID
10	CLERK	AAAXAaAANAAAAE9AAN
10	MANAGER	AAAXAaAANAAAAE9AAC
10	PRESIDENT	AAAXAaAANAAAAE9AAA
20	ANALYST	AAAXAaAANAAAAE9AAJ
20	ANALYST	AAAXAaAANAAAAE9AAL
20	CLERK	AAAXAaAANAAAAE9AAK
20	CLERK	AAAXAaAANAAAAE9AAM
20	MANAGER	AAAXAaAANAAAAE9AAD
30	CLERK	AAAXAaAANAAAAE9AAH
30	MANAGER	AAAXAaAANAAAAE9AAB
30	SALESMAN	AAAXAaAANAAAAE9AAE
30	SALESMAN	AAAXAaAANAAAAE9AAF
30	SALESMAN	AAAXAaAANAAAAE9AAG
30	SALESMAN	AAAXAaAANAAAAE9AAI

emp 테이블

ROWID	EMPNO	ENAME	JOB	MGR	...
AAATc1AAHAAAAHeAAA	7839	KING	PRESIDENT		...
AAATc1AAHAAAAHeAAB	7698	BLAKE	MANAGER	7839	...
AAATc1AAHAAAAHeAAC	7782	CLARK	MANAGER	7839	...
AAATc1AAHAAAAHeAAD	7566	JONES	MANAGER	7839	...
AAATc1AAHAAAAHeAAE	7654	MARTIN	SALESMAN	7698	...
AAATc1AAHAAAAHeAAF	7499	ALLEN	SALESMAN	7698	...
AAATc1AAHAAAAHeAAG	7844	TURNER	SALESMAN	7698	...
AAATc1AAHAAAAHeAAH	7900	JAMES	CLERK	7698	...
AAATc1AAHAAAAHeAAI	7521	WARD	SALESMAN	7698	...
AAATc1AAHAAAAHeAAJ	7902	FORD	ANALYST	7566	...
AAATc1AAHAAAAHeAAK	7369	SMITH	CLERK	7902	...
AAATc1AAHAAAAHeAAL	7788	SCOTT	ANALYST	7566	...
AAATc1AAHAAAAHeAAM	7876	ADAMS	CLERK	7788	...
AAATc1AAHAAAAHeAAN	7934	MILLER	CLERK	7782	...

index skip scan의 효과 높이는 결합 컬럼 인덱스는?

```
select  ename, sal, job, deptno
 from emp
 where  sal = 3000 :
```

첫번째 컬럼의 데이터의 종류가 적은 인덱스

DEPTNO	SAL
10	1000
10	2000
10	3000
10	4000
10	5000
10	6000
10	7000
20	1000
20	2000
20	3000
20	4000
20	5000
20	6000
20	7000

첫번째 컬럼의 데이터의 종류가 많은 인덱스

JOB	SAL
ANALYST	1000
ANALYST	2000
ANALYST	3000
CLERK	1000
CLERK	2000
CLERK	3000
CLERK	4000
MANAGER	1000
MANAGER	2000
MANAGER	3000
SALESMAN	1000
SALESMAN	2000
SALESMAN	3000
SALESMAN	4000