

INDEX 를 사용하는 SQL

CREATE INDEX emp_ename_ix ON emp(ename);

Index EMP_ENAME_IX 이(가) 생성되었습니다.

SELECT index_name, table_name

FROM user_indexes

WHERE table_name = 'EMP';

INDEX_NAME	TABLE_NAME
EMP_JOB_IDX	EMP
EMP_ENAME_IX	EMP

ALTER INDEX emp_ename_ix INVISIBLE;

Index EMP_ENAME_IX 이(가) 변경되었습니다.

SET AUTOTRACE ON EXPLAIN

자동 추적 사용 실행 계획만 표시합니다.

column rowid new_value rid

SELECT empno, ename, rowid FROM emp

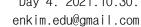
WHERE ename = 'SCOTT';

EMPNO	ENAME	ROWID
7788	SCOTT	AAAE6KAAEAAAAKmAAH

Id	Operation	Name		Rows		Bytes		Cost	(%CPU)	Time	
•	SELECT STATEMENT TABLE ACCESS FULI	•			•						•

Predicate Information (identified by operation id):

1 - filter("ENAME"='SCOTT')





SELECT empno, ename, rowid

FROM emp

WHERE rowid = '&rid';

이전:SELECT empno, ename, rowid

FROM emp

WHERE rowid = '&rid'

신규:SELECT empno, ename, rowid

FROM emp

WHERE rowid = 'AAAE6KAAEAAAKmAAH'

EMPNO ENAME

ROWID

7788 SCOTT

AAAE6KAAEAAAAKmAAH

	Id	Operati	ion		Name	Rows		Bytes		Cost	(%CPU)	Time	
•				USER ROWID		•			•		, , ,		

ALTER INDEX emp_ename_ix VISIBLE ;

Index EMP_ENAME_IX 이(가) 변경되었습니다.

SELECT empno, ename, rowid

FROM emp

WHERE ename = 'SCOTT';

EMPNO ENAME

ROWID

7788 SCOTT

AAAE6KAAEAAAAKmAAH

Plan hash value: 80071485

Id	Operation	Name		Rows	 	Bytes	Co	st	(%CPU)	Time	-
1 1	SELECT STATEMENT TABLE ACCESS BY INDEX INDEX RANGE SCAN	 ROWID EMP EMP ENAME)	į	1 1 1	İ	22	İ	2	2 (0)	00:00:01 00:00:01	İ

Predicate Information (identified by operation id):

2 - access("ENAME"='SCOTT')



Case 1. 잘못 사용된 조건식 또는 조건식의 부재

CREATE INDEX emp_deptno_ix ON emp(deptno);

Index EMP_DEPTNO_IX이(가) 생성되었습니다.

SELECT deptno, SUM(sal)

FROM emp

GROUP BY deptno

HAVING deptno IN (10,20);

SUM(SAL)	DEPTN0
10875	20
8750	10

Id Operation	Name	 ;	Rows		Bytes	Cost	(%CPU)	Time
0 SELECT STATEMENT * 1 FILTER 2 HASH GROUP BY 3 TABLE ACCESS FULL	İ I	İ	1	 	7	 4	1 (25)	00:00:01 00:00:01 00:00:01

Predicate Information (identified by operation id):

1 - filter("DEPTNO"=10 OR "DEPTNO"=20)

SELECT deptno, SUM(sal)

FROM emp

WHERE deptno IN (10,20)

GROUP BY deptno;

SUM(SAL)	DEPTNO
8750	10
10875	20

	d	Operation	Name	Ro	ows B	sytes Co	ost (%CPU)	Time
	1	SELECT STATEMENT SORT GROUP BY NOSORT			2 2	·		00:00:01
 *	2 3 4	INLIST ITERATOR TABLE ACCESS BY INDEX INDEX RANGE SCAN	ROWID EMP EMP_DEPTN	 0_IX	9 9 9	63 	2 (0) 1 (0)	00:00:01 00:00:01

Predicate Information (identified by operation id):

4 - access("DEPTNO"=10 OR "DEPTNO"=20)



Case 2. 컬럼의 변형 (표현식에 포함된 컬럼)

case2 - 1. emp 테이블에서 ename 컬럼의 두 번째 문자가 대문자 C인 사원을 조회하시오.

SELECT * FROM emp

WHERE SUBSTR(ename,2,1) = 'C';

EMPNO E	NAME	JOB MGR			HIRED	ATE	=	SAI	_ C	OMM	DEPTNO
7788 SCOTT		ANALYST 75			1982/	12/	 '09	3000	0		20
Id Oper	ation	Name	 Rows		Bytes		Cost	(%CPU)	Time		
		 NT FULL EMP		1 1					00:00:01 00:00:01		
Predicate I						<u>.</u>					
							-				

1 - filter(SUBSTR("ENAME",2,1)='C')

case2 - 2. 1년 급여가 30000 이상인 사원의 모든 정보를 조회하시오.

CREATE INDEX emp_sal_ix ON emp(sal);

Index EMP_SAL_IX이(가) 생성되었습니다.

SELECT *

FROM emp

WHERE sal * 12 > 30000;

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7566	JONES	MANAGER	 7839	1981/04/02	 2975		20
7698	BLAKE	MANAGER	7839	1981/05/01	2850		30
7788	SC0TT	ANALYST	7566	1982/12/09	3000		20
7839	KING	PRESIDENT		1981/11/17	5000		10
7902	FORD	ANALYST	7566	1981/12/03	3000		20
aq0 b1	 eration	 Name	 Rows I	Bvtes Cost	 : (%CPU) Time		

	d Operation	Name		Rows		Bytes		Cost	(%CPU)	Time	
•	0 SELECT STATEMENT 1 TABLE ACCESS FUL	•			•		•				•

Predicate Information (identified by operation id):

1 - filter("SAL"*12>30000)



case2 - 1 -> sol)

CREATE INDEX emp_ename_fbi ON emp(SUBSTR(ename,2,1));

Index EMP_ENAME_FBI 이(가) 생성되었습니다.

SELECT *

FROM emp

WHERE SUBSTR(ename, 2, 1) = 'C';

E	EMPNO ENAME	J0B	MGR	HIREDATE			SAL	COI	ИΜ	DE	PTN0	
	7788 SCOTT	ANALYST	7566	1982/12/09		3	000				20	
 Id	Operation	 	Name	 l	Rows		Bytes	Cost	(%CP	 U)	Time	
0 1 * 2	TABLE ACCES	S BY INDEX ROWID		 ENAME_FBI	1 1 1		38 38		2 (0)	00:00:01 00:00:01 00:00:01	İ

Predicate Information (identified by operation id):

2 - access(SUBSTR("ENAME",2,1)='C')

case2 - 2 \rightarrow sol)

SELECT *

FROM emp

WHERE sal > 30000 / 12;

EMPNO	ENAME	J0B	MGR	HIREDA	TE		SAL	(COMM	DEPTNO
7698	BLAKE	MANAGER	7839	1981/0	 5/01		2850			30
7566	JONES	MANAGER	7839	1981/0	4/02		2975			20
7788	SCOTT	ANALYST	7566	1982/1	2/09		3000			20
7902	FORD	ANALYST	7566	1981/1	2/03		3000			20
7839	KING	PRESIDENT		1981/1	1/17		5000			10
Id Ope	eration	 	 Name		 Row	 s	Bytes	Cost	(%CPU)	Time
0 SEL	LECT STATEM	ENT				8	304	2	2 (0)	00:00:01
1 T/	ABLE ACCESS	BY INDEX ROWID!	EMP			8	304	2	2 (0)	00:00:01
 * 2 	INDEX RANGE	SCAN	EMP_S	SAL_IX		8		1	(0)	00:00:01

Predicate Information (identified by operation id):

2 - access("SAL">2500)

DROP INDEX emp_ename_fbi;

Index EMP_ENAME_FBI이(가) 삭제되었습니다.



Case 3. IS NULL, IS NOT NULL 비교

CREATE INDEX emp_comm ON emp(comm);

Index EMP_COMM 이(가) 생성되었습니다.

case3 - 1. IS NULL 체크!

SELECT *

FROM emp

WHERE comm IS NULL;

EMPNO	ENAME	J0B	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980/12/17	800		20
7566	JONES	MANAGER	7839	1981/04/02	2975		20
•••							

10 개 행이 선택되었습니다.

Id		Operation		Name		Rows		Bytes		Cost	(%CPU)	Time	
•	•	SELECT STATEMENT TABLE ACCESS FUL	•				•		•				•

Predicate Information (identified by operation id):

1 - filter("COMM" IS NULL)

case3 - 2. IS NOT NULL 체크!

SELECT *

FROM emp

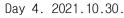
WHERE comm IS NOT NULL;

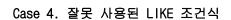
EMPNO	ENAME	J0B	MGR	HIREDATE	SAL 	COMM	DEPTNO
7844	TURNER	SALESMAN	7698	1981/09/08	1500	0	30
7499	ALLEN	SALESMAN	7698	1981/02/20	1600	300	30
7521	WARD	SALESMAN	7698	1981/02/22	1250	500	30
7654	MARTIN	SALESMAN	7698	1981/09/28	1250	1400	30

	d	Operation	 	Name		Rows		Bytes		Cost	(%CPU)	Time	
•		SELECT STATEMENT	•		ļ		•		•				•
	1	TABLE ACCESS BY INDE	EX ROWID!	EMP		4		152		4	2 (0)	00:00:01	
*	2	INDEX FULL SCAN	- 1	EMP_COMM		4					1 (0)	00:00:01	

Predicate Information (identified by operation id):

2 - filter("COMM" IS NOT NULL)





case4 - 1. emp 테이블의 사원 이름이 대문자 S로 시작되는 사원을 조회하시오.

SELECT *

FROM emp

WHERE ename LIKE 'S%';

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EMPNO	ENAME	J0B		MGR	HIREDATE	.			SAL	С	OMN	l Di	EPTNO	
	SCOTT SMITH	ANALYST CLERK			1982/12/ 1980/12/			,	3000 800				20 20	
Id Ope	eration		 	Name		 R	ows		Bytes	Cos	t (%CPU)	Time	 -
1 1 TA	ECT STATEME ABLE ACCESS NDEX RANGE	BY INDEX	-		ENAME_IX	 	2		76 76	'	2 2 1	(0)	00:00:01 00:00:01 00:00:01	İ

Predicate Information (identified by operation id):

2 - access("ENAME" LIKE 'S%') filter("ENAME" LIKE 'S%')

case4 - 2. emp 테이블의 사원 이름이 대문자 S로 끝나는 사원을 조회하시오.

SELECT *

FROM emp

WHERE ename LIKE '%S';

EMPNO	ENAME	J0B	MGR	HIREDATE		S	AL	CO	MM D	EPTN0
7900	ADAMS JAMES JONES	CLERK CLERK MANAGER	7698	1983/01/ 1981/12/ 1981/04/	03	• •	 00 50 75			20 30 20
Id Ope	eration		Name		Rows	B	ytes	Cost	(%CPU)	Time
1 1 T/	LECT STATEME ABLE ACCESS INDEX FULL S	BY INDEX ROWID		ENAME_IX	- -	 1 1 1	38 38	•	2 (0)	00:00:01 00:00:01 00:00:01

Predicate Information (identified by operation id):

2 - filter("ENAME" LIKE '%S' AND "ENAME" IS NOT NULL)

INDEX FULL SCAN 이 아닌 INDEX RANGE SCAN 을 할 수 있는 방법은 없을까?



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case4 - 2 -> 또 다른 방법!!

CREATE INDEX ename_fbi ON emp(REVERSE(ename)) ;

Index ENAME_FBI이(가) 생성되었습니다.

SELECT *

FROM emp

WHERE REVERSE(ename) LIKE 'S%';

EMPNO	ENAME	J0B		MGR	HIRE	DATE		S	AL		COMM	DEPTN0	
7566	JAMES JONES ADAMS	CLERK MANAGER CLERK		7698 7839 7788	1981	/04/0	2	29	50 75 00			30 20 20	
Id Ope	eration		l	Name		Ro	 WS	Byte	 s	Cost	(%CPU)	Time	
1 T/	LECT STATEM ABLE ACCESS INDEX RANGE	BY INDEX	 ROWID	EMP ENAME	 FB1		1 1 1		8 8 8	2 2 1	(0)	00:00:01 00:00:01 00:00:01	

Predicate Information (identified by operation id):

2 - access(REVERSE("ENAME") LIKE 'S%') filter(REVERSE("ENAME") LIKE 'S%')

DROP INDEX ename_fbi ;

Index ENAME_FBI 이(가) 삭제되었습니다.

단 와일드 카드가 앞뒤로 정의되는 경우 사용 불가!!



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Case 5. 부정형 비교

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SELECT *

FROM emp

WHERE deptno != 20;

EMPNO	ENAME	J0B	MGR	HIREDATE	SAL	COMM	DEPTN0
7499	ALLEN	SALESMAN	7698	1981/02/20	1600	300	30
7521		SALESMAN		1981/02/22	1250	500	30
7654	MARTIN	SALESMAN	7698	1981/09/28	1250	1400	30
7698	BLAKE	MANAGER	7839	1981/05/01	2850		30
7782	CLARK	MANAGER	7839	1981/06/09	2450		10
7839	KING	PRESIDENT		1981/11/17	5000		10
7844	TURNER	SALESMAN	7698	1981/09/08	1500	0	30
7900	JAMES	CLERK	7698	1981/12/03	950		30
7934	MILLER	CLERK	7782	1982/01/23	1300		10
9개 행이 선	선택되었습니	다.					

			_
Id Operation	Name Rows	Bytes Cost (%CPU) Time	

	O SELECT STATEMENT	9	342	3	(0) 00:00:01
*	1 TABLE ACCESS FULL EMP	9	342	3	(0) 00:00:01

Predicate Information (identified by operation id):

1 - filter("DEPTNO"<>20)

SELECT /*+ index(emp(deptno)) */*

FROM emp

WHERE deptno != 20;

	d	Operation		Name	Rows	 	Bytes	Cost	(%CPU)	Time	-
	0	SELECT STATEMENT			9		342		2 (0)	00:00:01	
	1	TABLE ACCESS BY	INDEX ROWID!	EMP	9		342	1 :	2 (0)	00:00:01	
*	2	INDEX FULL SCAN	1	EMP_DEPTNO_IX	9				1 (0)	00:00:01	

Predicate Information (identified by operation id):

2 - filter("DEPTNO" <> 20)



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case 5 -> sol : INDEX RANGE SCAN 가능하도록 조건식 변경!

SELECT * FROM emp

WHERE deptno IN (10,30);

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EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7782	CLARK	MANAGER	7839	1981/06/09	2450		10
7839	KING	PRESIDENT		1981/11/17	5000		10
7934	MILLER	CLERK	7782	1982/01/23	1300		10
7499	ALLEN	SALESMAN	7698	1981/02/20	1600	300	30
7521	WARD	SALESMAN	7698	1981/02/22	1250	500	30
7654	MARTIN	SALESMAN	7698	1981/09/28	1250	1400	30
7698	BLAKE	MANAGER	7839	1981/05/01	2850		30
7844	TURNER	SALESMAN	7698	1981/09/08	1500	0	30
7900	JAMES	CLERK	7698	1981/12/03	950		30

9개 행이 선택되었습니다.

	d	Operation	Name	Row	vs {	Bytes C	ost (%	 CPU) 	Time	
 	0 1	SELECT STATEMENT INLIST ITERATOR	l I	 	9	342	2	(0) 	00:00:01	
 *	2 3	TABLE ACCESS BY INDEX INDEX RANGE SCAN	ROWID EMP EMP_DEPT	NO_IX	9 9	342 	2		00:00:01 00:00:01	

Predicate Information (identified by operation id):

3 - access("DEPTNO"=10 OR "DEPTNO"=30)



Case 6. 암시적 형 변환

SELECT *

FROM emp

WHERE empno LIKE '77%';

EMPNO	ENAME	J0B	MGR	HIREDATE		SAL	COMM	DEPTNO	
	CLARK SCOTT	MANAGER ANALYST		1981/06/0 1982/12/0		2450 3000		10 20	
d Ope	eration	Name	Rows	Bytes C	 ost (%CPU) Time	 l		
	LECT STATEME	ENT FULL EMP	1	38 38	3	(0) 00:00:	•		

Predicate Information (identified by operation id):

1 - filter(TO_CHAR("EMPNO") LIKE '77%')

SELECT *

FROM emp

WHERE empno BETWEEN 7700 AND 7799;

EMPNO ENAME		JOB I		MGR	MGR HIREDATE			SAL			CO	MM D	DEPTNO	
	CLARK SCOTT	MANAGER ANALYST			1981/06 1982/12	-			2450 3000				10 20	
Id Ope	eration		 	Name			Rows	 S	Bytes		Cost	(%CPU)	Time	
1 T/	LECT STATEME ABLE ACCESS INDEX RANGE	BY INDEX			EMPNO_IX			4 4 4	152	•	_	2 (0)	00:00:01 00:00:01 00:00:01	İ

Predicate Information (identified by operation id):

2 - access("EMPNO">=7700 AND "EMPNO"<=7799)

SET AUTOTRACE OFF

자동 추적 사용 안함