DATABASE SYSTEMS

JOINS

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EQUI-JOIN FORMATION THROUGH NATURAL JOINS

- The SQL NATURAL JOIN is a type of EQUI JOIN and is structured in such a way that, columns with the same name of associated tables will appear once only.
- NATURAL JOIN creates an implicit join clause for you based on the common columns in the two tables being joined.

Guidelines:

- The associated tables have one or more pairs of identically named columns.
- The columns must be the same data type.
- The common column should also have the same name in the joining tables.
- No qualifiers can be used with the common column, if Natural Join keyword is used to form the join.

```
Select ename,deptno, dname from emp Natural Join dept;
```

Results | Script Output | Explain | Autotrace | DBMS Output | OW

Results:

	ENAME	DEPTNO	DNAME
1	CLARK	10	ACCOUNTING
2	KING	10	ACCOUNTING
3	MILLER	10	ACCOUNTING
4	JONES	20	RESEARCH
5	FORD	20	RESEARCH
6	ADAMS	20	RESEARCH
7	SMITH	20	RESEARCH
8	SCOTT	20	RESEARCH
9	WARD	30	SALES
10	TURNER	30	SALES
11	ALLEN	30	SALES
12	JAMES	30	SALES
13	BLAKE	30	SALES
14	MARTIN	30	SALES

DIFFERENT NAMES OF COMMON COLUMNS

```
CREATE TABLE EMP5 AS SELECT * FROM EMP
ALTER TABLE EMP5 RENAME COLUMN DEPTNO TO DEPARTMENTNO
select * from emp5
```

Results | Script Output | Explain | Autotrace | DBMS Output | OWA Output

esults:

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPARTMENTNO
1	7369	SMITH	CLERK	7902	17-DEC-80	800	(null)	20
2	7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30
3	7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30
4	7566	JONES	MANAGER	7839	02-APR-81	2975	(null)	20
5	7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30
6	7698	BLAKE	MANAGER	7839	01-MAY-81	2850	(null)	30
7	7782	CLARK	MANAGER	7839	09-JUN-81	2450	(null)	10
8	7788	SCOTT	ANALYST	7566	19-APR-87	3000	(null)	20
9	7839	KING	PRESIDENT	(null)	17-NOV-81	5000	(null)	10
10	7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30
11	7876	ADAMS	CLERK	7788	23-MAY-87	1100	(null)	20
12	7900	JAMES	CLERK	7698	03-DEC-81	950	(null)	30
13	7902	FORD	ANALYST	7566	03-DEC-81	3000	(null)	20
14	7934	MILLER	CLERK	7782	23-JAN-82	1300	(null)	10

```
SELECT * FROM EMP5 NATURAL JOIN DEPT
```

Results | Script Output | Explain | Autotrace | DBMS Output | OWA Output

esults:

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPARTMENTNO	DEPTNO	DNAME	LOC
1	7369	SMITH	CLERK	7902	17-DEC-80	800	(null)	20	10	ACCOUNTING	NEW YORK
2	7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30	10	ACCOUNTING	NEW YORK
3	7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30	10	ACCOUNTING	NEW YORK
4	7566	JONES	MANAGER	7839	02-APR-81	2975	(null)	20	10	ACCOUNTING	NEW YORK
5	7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30	10	ACCOUNTING	NEW YORK
6	7698	BLAKE	MANAGER	7839	01-MAY-81	2850	(null)	30	10	ACCOUNTING	NEW YORK
7	7782	CLARK	MANAGER	7839	09-JUN-81	2450	(null)	10	10	ACCOUNTING	NEW YORK
8	7788	SCOTT	ANALYST	7566	19-APR-87	3000	(null)	20	10	ACCOUNTING	NEW YORK
9	7839	KING	PRESIDENT	(null)	17-NOV-81	5000	(null)	10	10	ACCOUNTING	NEW YORK
10	7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30	10	ACCOUNTING	NEW YORK
11	7876	ADAMS	CLERK	7788	23-MAY-87	1100	(null)	20	10	ACCOUNTING	NEW YORK
12	7900	JAMES	CLERK	7698	03-DEC-81	950	(null)	30	10	ACCOUNTING	NEW YORK
13	7902	FORD	ANALYST	7566	03-DEC-81	3000	(null)	20	10	ACCOUNTING	NEW YORK
14	7934	MILLER	CLERK	7782	23-JAN-82	1300	(null)	10	10	ACCOUNTING	NEW YORK
15	7369	SMITH	CLERK	7902	17-DEC-80	800	(null)	20	20	RESEARCH	DALLAS
16	7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30	20	RESEARCH	DALLAS
17	7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30	20	RESEARCH	DALLAS
18	7566	JONES	MANAGER	7839	02-APR-81	2975	(null)	20	20	RESEARCH	DALLAS
19	7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30	20	RESEARCH	DALLAS
20	7698	BLAKE	MANAGER	7839	01-MAY-81	2850	(null)	30	20	RESEARCH	DALLAS

The common column should also have the same name in the joining tables

SINGLE COMMON COLUMN

```
select * from emp4
ALTER TABLE EMP4 ADD (DNAME VARCHAR(10))
UPDATE EMP4 SET DNAME = (SELECT DNAME FROM DEPT WHERE DEPTNO = 10) WHERE departmentno= 10
UPDATE EMP4 SET DNAME = (SELECT DNAME FROM DEPT WHERE DEPTNO = 20) WHERE departmentno= 20
UPDATE EMP4 SET DNAME = (SELECT DNAME FROM DEPT WHERE DEPTNO = 30) WHERE departmentno= 30
```

Results | Script Output | Explain | Autotrace | DBMS Output | OWA Output

Results:

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPARTMENTNO	DNAME
1	7369	SMITH	CLERK	7902	17-DEC-80	800	(null)	20	RESEARCH
2	7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30	SALES
3	7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30	SALES
4	7566	JONES	MANAGER	7839	02-APR-81	2975	(null)	20	RESEARCH
5	7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30	SALES
6	7698	BLAKE	MANAGER	7839	01-MAY-81	2850	(null)	30	SALES
7	7782	CLARK	MANAGER	7839	09-JUN-81	2450	(null)	10	ACCOUNTING
8	7788	SCOTT	ANALYST	7566	19-APR-87	3000	(null)	20	RESEARCH
9	7839	KING	PRESIDENT	(null)	17-NOV-81	5000	(null)	10	ACCOUNTING
10	7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30	SALES
11	7876	ADAMS	CLERK	7788	23-MAY-87	1100	(null)	20	RESEARCH
12	7900	JAMES	CLERK	7698	03-DEC-81	950	(null)	30	SALES
13	7902	FORD	ANALYST	7566	03-DEC-81	3000	(null)	20	RESEARCH
14	7934	MILLER	CLERK	7782	23-JAN-82	1300	(null)	10	ACCOUNTING

```
SELECT ENAME,DEPTNO,DNAME FROM EMP4 NATURAL JOIN DEPT
```

Results | Script Output | Explain | Autotrace | DBMS Output | O

Results:

	ENAME	DEPTNO	DNAME
1	SMITH	20	RESEARCH
2	ALLEN	30	SALES
3	WARD	30	SALES
4	JONES	20	RESEARCH
5	MARTIN	30	SALES
6	BLAKE	30	SALES
7	CLARK	10	ACCOUNTING
8	SCOTT	20	RESEARCH
9	KING	10	ACCOUNTING
10	TURNER	30	SALES
11	ADAMS	20	RESEARCH
12	JAMES	30	SALES
13	FORD	20	RESEARCH
14	MILLER	10	ACCOUNTING

MULTIPLE COMMON COLUMNS

```
ALTER TABLE EMP4 RENAME COLUMN DEPARTMENTNO TO DEPTNO
select * from emp4
```

Results | Script Output | Explain | Autotrace | DBMS Output | OWA Output

esults:

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO	DNAME
1	7369	SMITH	CLERK	7902	17-DEC-80	800	(null)	20	RESEARCH
2	7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30	SALES
3	7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30	SALES
4	7566	JONES	MANAGER	7839	02-APR-81	2975	(null)	20	RESEARCH
5	7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30	SALES
6	7698	BLAKE	MANAGER	7839	01-MAY-81	2850	(null)	30	SALES
7	7782	CLARK	MANAGER	7839	09-JUN-81	2450	(null)	10	ACCOUNTING
8	7788	SCOTT	ANALYST	7566	19-APR-87	3000	(null)	20	RESEARCH
9	7839	KING	PRESIDENT	(null)	17-NOV-81	5000	(null)	10	ACCOUNTING
10	7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30	SALES
11	7876	ADAMS	CLERK	7788	23-MAY-87	1100	(null)	20	RESEARCH
12	7900	JAMES	CLERK	7698	03-DEC-81	950	(null)	30	SALES
13	7902	FORD	ANALYST	7566	03-DEC-81	3000	(null)	20	RESEARCH
14	7934	MILLER	CLERK	7782	23-JAN-82	1300	(null)	10	ACCOUNTING

```
SELECT * FROM EMP4 NATURAL JOIN DEPT
```

Results | Script Output | Explain | Autotrace | DBMS Output | OWA Output

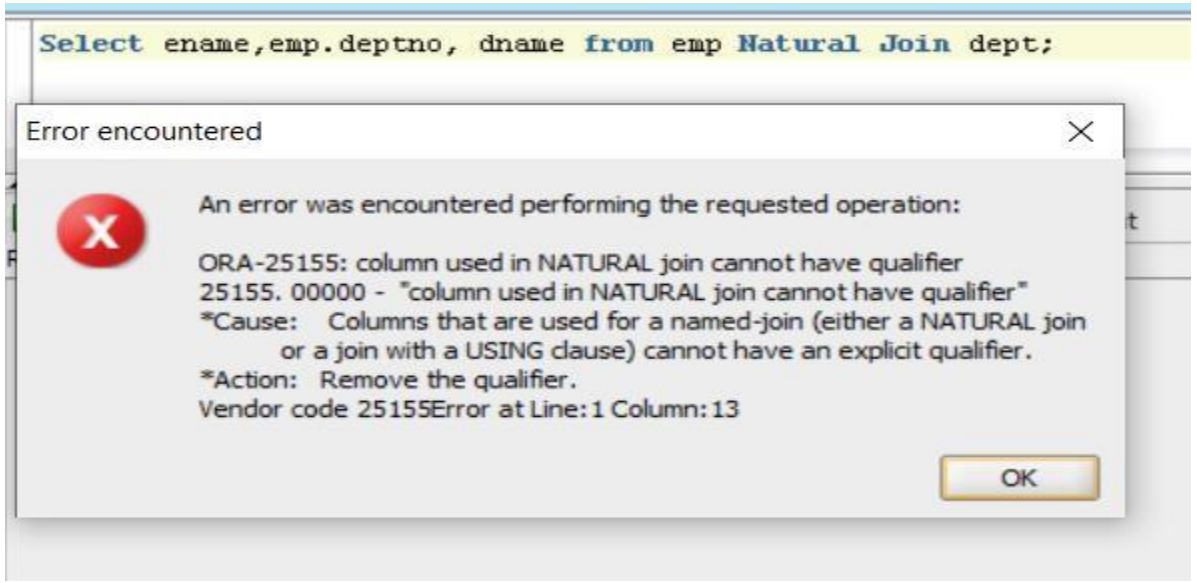
esults:

	DNAME	EMPNO	ENAME	JOB	MGR	HIRED...	SAL	COMM	DEPTNO	LOC
1	RESEARCH	7369	SMITH	CLERK	7902	17-DEC-80	800	(null)	20	DALLAS
2	SALES	7499	ALLEN	SALES...	7698	20-FEB-81	1600	300	30	CHICAGO
3	SALES	7521	WARD	SALES...	7698	22-FEB-81	1250	500	30	CHICAGO
4	RESEARCH	7566	JONES	MANA...	7839	02-APR-81	2975	(null)	20	DALLAS
5	SALES	7654	MARTIN	SALES...	7698	28-SEP-81	1250	1400	30	CHICAGO
6	SALES	7698	BLAKE	MANA...	7839	01-MAY-81	2850	(null)	30	CHICAGO
7	ACCOUN...	7782	CLARK	MANA...	7839	09-JUN-81	2450	(null)	10	NEW YORK
8	RESEARCH	7788	SCOTT	ANALYST	7566	19-APR-87	3000	(null)	20	DALLAS
9	ACCOUN...	7839	KING	PRESI...	(null)	17-NOV-81	5000	(null)	10	NEW YORK
10	SALES	7844	TURNER	SALES...	7698	08-SEP-81	1500	0	30	CHICAGO
11	RESEARCH	7876	ADAMS	CLERK	7788	23-MAY-87	1100	(null)	20	DALLAS
12	SALES	7900	JAMES	CLERK	7698	03-DEC-81	950	(null)	30	CHICAGO
13	RESEARCH	7902	FORD	ANALYST	7566	03-DEC-81	3000	(null)	20	DALLAS
14	ACCOUN...	7934	MILLER	CLERK	7782	23-JAN-82	1300	(null)	10	NEW YORK

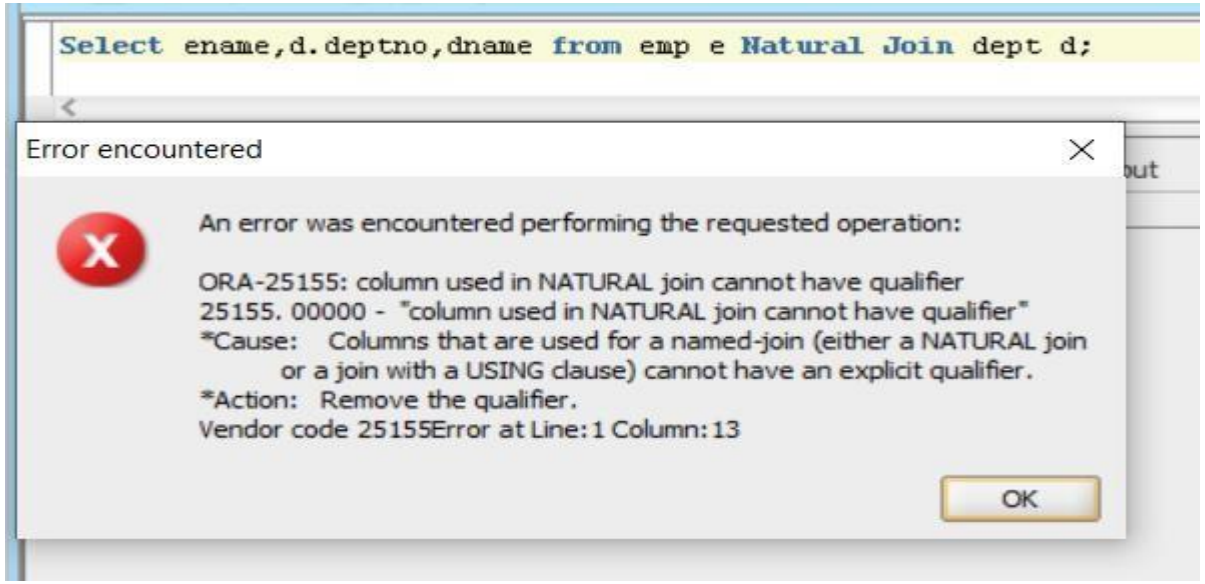
The associated tables have one or more pairs of identically named columns

USE OF QUALIFIERSS

```
Select ename,emp.deptno, dname from emp Natural Join dept;
```

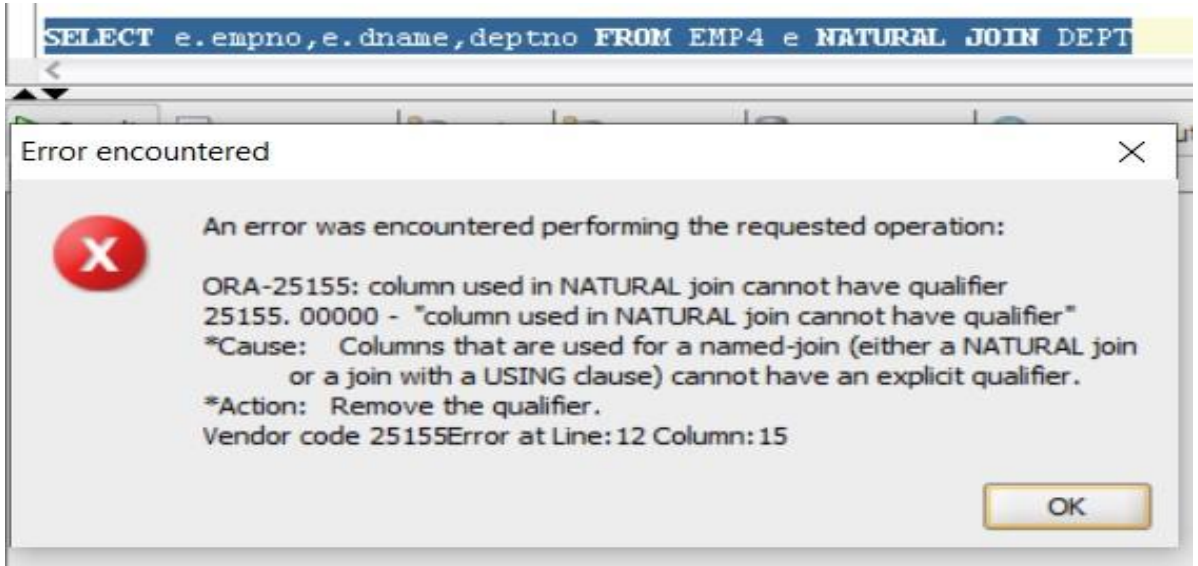



```
Select ename,d.deptno,dname from emp e Natural Join dept d;
```

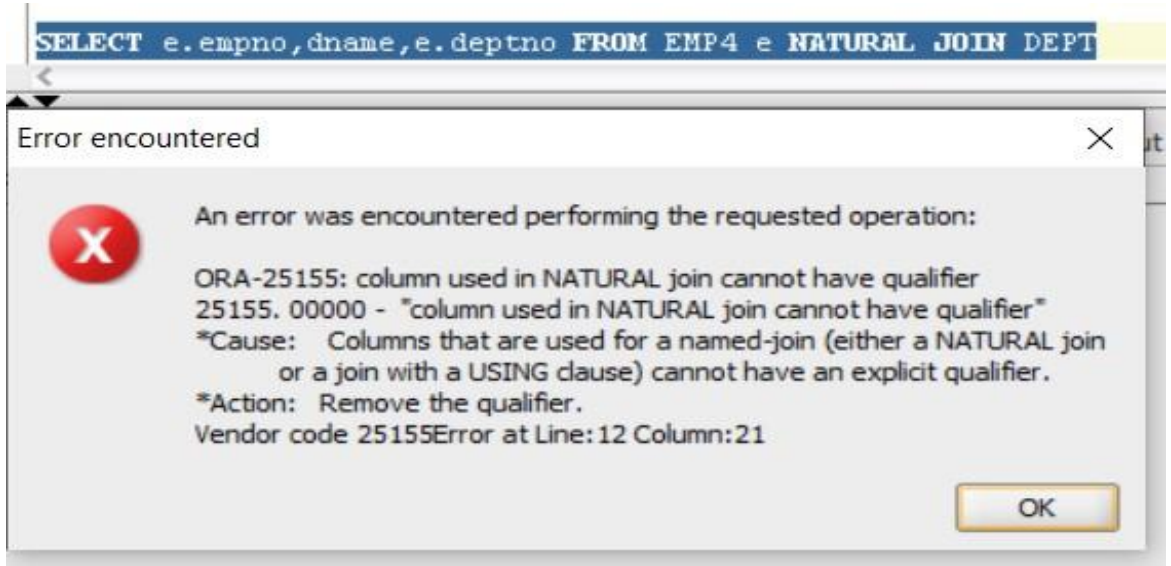


No qualifiers can be used with the common column, if Natural Join keyword is used to form the join

```
SELECT e.empno,e.dname,deptno FROM EMP4 e NATURAL JOIN DEPT
```




```
SELECT e.empno,dname,e.deptno FROM EMP4 e NATURAL JOIN DEPT
```



QUALIFIERS WITH COLUMNS NOT ASSOCIATED WITH JOIN

```
SELECT e.empno,dname,deptno FROM EMP4 e NATURAL JOIN DEPT
```

Results | Script Output | Explain | Autotrace | DBMS Output | OWA

esults:

	EMPNO	DNAME	DEPTNO
1	7369	RESEARCH	20
2	7499	SALES	30
3	7521	SALES	30
4	7566	RESEARCH	20
5	7654	SALES	30
6	7698	SALES	30
7	7782	ACCOUNTING	10
8	7788	RESEARCH	20
9	7839	ACCOUNTING	10
10	7844	SALES	30
11	7876	RESEARCH	20
12	7900	SALES	30
13	7902	RESEARCH	20
14	7934	ACCOUNTING	10

```
INSERT INTO EMP4 VALUES (3214,'TIM','CLERK',7782,'25-FEB-2021',6000,600,30,'FINANCE')
select * from emp4
```

Results | Script Output | Explain | Autotrace | DBMS Output | OWA Output

Results:

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO	DNAME
1	7369	SMITH	CLERK	7902	17-DEC-80	800	(null)	20	RESEARCH
2	7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30	SALES
3	7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30	SALES
4	7566	JONES	MANAGER	7839	02-APR-81	2975	(null)	20	RESEARCH
5	7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30	SALES
6	7698	BLAKE	MANAGER	7839	01-MAY-81	2850	(null)	30	SALES
7	7782	CLARK	MANAGER	7839	09-JUN-81	2450	(null)	10	ACCOUNTING
8	7788	SCOTT	ANALYST	7566	19-APR-87	3000	(null)	20	RESEARCH
9	7839	KING	PRESIDENT	(null)	17-NOV-81	5000	(null)	10	ACCOUNTING
10	7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30	SALES
11	7876	ADAMS	CLERK	7788	23-MAY-87	1100	(null)	20	RESEARCH
12	7900	JAMES	CLERK	7698	03-DEC-81	950	(null)	30	SALES
13	7902	FORD	ANALYST	7566	03-DEC-81	3000	(null)	20	RESEARCH
14	7934	MILLER	CLERK	7782	23-JAN-82	1300	(null)	10	ACCOUNTING
15	3214	TIM	CLERK	7782	25-FEB-21	6000	600	30	FINANCE

```
SELECT * FROM EMP4 NATURAL JOIN DEPT
```

Results | Script Output | Explain | Autotrace | DBMS Output | OWA Output

esults:

	DNAME	EMPNO	ENAME	JOB	MGR	HIRED...	SAL	COMM	DEPTNO	LOC
1	RESEARCH	7369	SMITH	CLERK	7902	17-DEC-80	800	(null)	20	DALLAS
2	SALES	7499	ALLEN	SALES...	7698	20-FEB-81	1600	300	30	CHICAGO
3	SALES	7521	WARD	SALES...	7698	22-FEB-81	1250	500	30	CHICAGO
4	RESEARCH	7566	JONES	MANA...	7839	02-APR-81	2975	(null)	20	DALLAS
5	SALES	7654	MARTIN	SALES...	7698	28-SEP-81	1250	1400	30	CHICAGO
6	SALES	7698	BLAKE	MANA...	7839	01-MAY-81	2850	(null)	30	CHICAGO
7	ACCOUN...	7782	CLARK	MANA...	7839	09-JUN-81	2450	(null)	10	NEW YORK
8	RESEARCH	7788	SCOTT	ANALYST	7566	19-APR-87	3000	(null)	20	DALLAS
9	ACCOUN...	7839	KING	PRESI...	(null)	17-NOV-81	5000	(null)	10	NEW YORK
10	SALES	7844	TURNER	SALES...	7698	08-SEP-81	1500	0	30	CHICAGO
11	RESEARCH	7876	ADAMS	CLERK	7788	23-MAY-87	1100	(null)	20	DALLAS
12	SALES	7900	JAMES	CLERK	7698	03-DEC-81	950	(null)	30	CHICAGO
13	RESEARCH	7902	FORD	ANALYST	7566	03-DEC-81	3000	(null)	20	DALLAS
14	ACCOUN...	7934	MILLER	CLERK	7782	23-JAN-82	1300	(null)	10	NEW YORK

The SQL NATURAL JOIN is a type of EQUI JOIN

```
UPDATE EMP4 SET DNAME = NULL
select * from emp4
```

Results | Script Output | Explain | Autotrace | DBMS Output | OWA Output

esults:

	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO	DNAME
1	7369	SMITH	CLERK	7902	17-DEC-80	800	(null)	20	(null)
2	7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	30	(null)
3	7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30	(null)
4	7566	JONES	MANAGER	7839	02-APR-81	2975	(null)	20	(null)
5	7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	30	(null)
6	7698	BLAKE	MANAGER	7839	01-MAY-81	2850	(null)	30	(null)
7	7782	CLARK	MANAGER	7839	09-JUN-81	2450	(null)	10	(null)
8	7788	SCOTT	ANALYST	7566	19-APR-87	3000	(null)	20	(null)
9	7839	KING	PRESIDENT	(null)	17-NOV-81	5000	(null)	10	(null)
10	7844	TURNER	SALESMAN	7698	08-SEP-81	1500	0	30	(null)
11	7876	ADAMS	CLERK	7788	23-MAY-87	1100	(null)	20	(null)
12	7900	JAMES	CLERK	7698	03-DEC-81	950	(null)	30	(null)
13	7902	FORD	ANALYST	7566	03-DEC-81	3000	(null)	20	(null)
14	7934	MILLER	CLERK	7782	23-JAN-82	1300	(null)	10	(null)
15	3214	TIM	CLERK	7782	25-FEB-21	6000	600	30	(null)

```
SELECT * FROM EMP4 NATURAL JOIN DEPT
```