The NOT NULL Constraint

Ensures that null values are not permitted for the column

EMP

EMPNO	ENAME	JOB	 COMM	DEPTNO
7839	KING	PRESIDENT		10
7698	BLAKE	MANAGER		30
7782	CLARK	MANAGER		10
7566	JONES	MANAGER		20

NOT NULL constraint (no row can contain a null value for this column) Absence of NOT NULL constraint (any row can contain null for this column)

NOT NULL constraint

The NOT NULL Constraint

> Defined at the column level

```
SQL> CREATE TABLE emp(
2 empno NUMBER(4),
3 ename VARCHAR2(10) NOT NULL,
4 job VARCHAR2(9),
5 mgr NUMBER(4),
6 hiredate DATE,
7 sal NUMBER(7,2),
8 comm NUMBER(7,2),
9 deptno NUMBER(7,2) NOT NULL);
```

The UNIQUE Key Constraint

DEPT UNIQUE key constraint

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

li	nser	t ir	nto

50	SALES	DETROIT	—
60		BOSTON	(

Not allowed (DNAME-SALES already exists)

Allowed

The UNIQUE Key Constraint

Defined at either the table level or the column level

```
SQL> CREATE TABLE dept(
2 deptno NUMBER(2),
3 dname VARCHAR2(14),
4 loc VARCHAR2(13),
5 CONSTRAINT dept_dname_uk UNIQUE(dname));
```

The PRIMARY KEY Constraint



20

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

Ir	sert into
MARKETING	DALLAS
FINANCE	NEW YORK

Not allowed (DEPTNO-20 already exists) Not allowed (DEPTNO is null)

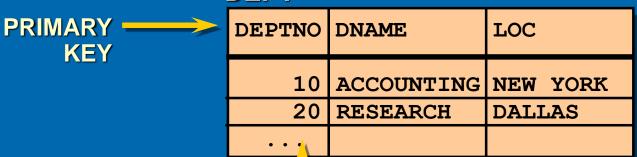
The PRIMARY KEY Constraint

Defined at either the table level or the column level

```
SQL> CREATE TABLE dept(
2 deptno NUMBER(2),
3 dname VARCHAR2(14),
4 loc VARCHAR2(13),
5 CONSTRAINT dept_dname_uk UNIQUE (dname),
6 CONSTRAINT dept_deptno_pk PRIMARY KEY(deptno));
```

The FOREIGN KEY Constraint

DEPT



EMP

EMPNO	ENAME	JOB	• • •	СОММ	DEPTNO
7839	KING	PRESIDENT			10
7698	BLAKE	MANAGER			30

Insert into

7571	FORD	MANAGER	• • •	200	9
7571	FORD	MANAGER	• • •	200	20

FOREIGN KEY

Not allowed (DEPTNO 9 does not exist in the DEPT table) Allowed

The FOREIGN KEY Constraint

```
SOL> CREATE TABLE emp (
 2
        empno NUMBER (4),
 3
        ename VARCHAR2(10) NOT NULL,
        job VARCHAR2(9),
 5
        mgr NUMBER (4),
        hiredate DATE,
 6
                 NUMBER (7,2),
        sal
 8
        comm NUMBER(7,2),
        deptno NUMBER (7,2) NOT NULL,
        CONSTRAINT emp_deptno fk FOREIGN KEY (deptno)
10
11
                   REFERENCES dept (deptno));
```

FOREIGN KEY Constraint Keywords

FOREIGN KEY

Defines the column in the child table at the table constraint level

- REFERENCES
 Identifies the table and column in the parent table
- ON DELETE CASCADE

Allows deletion in the parent table and deletion of the dependent rows in the child table

The CHECK Constraint

Defines a condition that each row must satisfy

```
..., deptno NUMBER(2),

CONSTRAINT emp_deptno_ck

CHECK (DEPTNO BETWEEN 10 AND 99),...
```

Adding a Constraint

```
ALTER TABLE table
ADD [CONSTRAINT constraint] type (column);
```

- Add or drop, but not modify, a constraint
- Enable or disable constraints
- Add a NOT NULL constraint by using the MODIFY clause

Adding a Constraint

Add a FOREIGN KEY constraint to the EMP table indicating that a manager must already exist as a valid employee in the EMP table.

```
SQL> ALTER TABLE emp
2 ADD CONSTRAINT emp_mgr_fk
3 FOREIGN KEY(mgr) REFERENCES emp(empno);
Table altered.
```

Dropping a Constraint

 Remove the manager constraint from the EMP table.

```
SQL> ALTER TABLE emp
2 DROP CONSTRAINT emp_mgr_fk;
Table altered.
```