```
SQL> cl scr

SQL> CREATE TABLE SampleNN01
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SampleNN01_SampID_NN NOT NULL,
  5   SampName VARCHAR2(10)
  6   CONSTRAINT SampleNN01_SampName_NN NOT NULL,
  7   SampDate DATE
  8  );

Table created.

SQL> DESC SampleNN01
 Name                                    Null?    Type
 --------------------------------------- -------- ----------------------------
 SAMPID                                  NOT NULL NUMBER(2)
 SAMPNAME                                NOT NULL VARCHAR2(10)
 SAMPDATE                                         DATE

SQL> INSERT INTO SampleNN01
  2  VALUES(1, 'SAMPLE01', SYSDATE);

1 row created.

SQL> INSERT INTO SampleNN01
  2  VALUES(NULL, 'SAMPLE01', SYSDATE);
VALUES(NULL, 'SAMPLE01', SYSDATE)
       *
ERROR at line 2:
ORA-01400: cannot insert NULL into ("SCOTT"."SAMPLENN01"."SAMPID")


SQL> INSERT INTO SampleNN01
  2  VALUES(2, NULL, SYSDATE);
VALUES(2, NULL, SYSDATE)
          *
ERROR at line 2:
ORA-01400: cannot insert NULL into ("SCOTT"."SAMPLENN01"."SAMPNAME")


SQL> INSERT INTO SampleNN01
  2  VALUES(2, 'SAMPLE02', NULL);

1 row created.

SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE SampleNN02
  2  (
  3   SampID NUMBER(2),
  4   SampName VARCHAR2(10)
  5   CONSTRAINT SampleNN02_SampName_NN NOT NULL,
  6   SampDate DATE,
```

```
   7    CONSTRAINT SampleNN02_SampID_NN NOT NULL(SampID)
   8* )
SQL> /
 CONSTRAINT SampleNN02_SampID_NN NOT NULL(SampID)
                                    *
ERROR at line 7:
ORA-00904: : invalid identifier


SQL> cl scr

SQL> CREATE TABLE SampUNQ01
   2  (
   3   SampID NUMBER(2)
   4   CONSTRAINT SampUNQ01_SampID_UNQ UNIQUE,
   5   SampName VARCHAR2(10),
   6   SampDate DATE
   7  );

Table created.

SQL> INSERT INTO SampUNQ01
   2  VALUES(1, 'SAMPLE01', SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ01
   2  VALUES(1, 'SAMPLE02', SYSDATE);
INSERT INTO SampUNQ01
*
ERROR at line 1:
ORA-00001: unique constraint (SCOTT.SAMPUNQ01_SAMPID_UNQ) violated


SQL> INSERT INTO SampUNQ01
   2  VALUES(NULL, 'SAMPLE02', SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ01
   2  VALUES(NULL, 'SAMPLE03', SYSDATE);

1 row created.

SQL> cl scr

SQL> ED
Wrote file afiedt.buf

   1  CREATE TABLE SampUNQ02
   2  (
   3   SampID NUMBER(2),
   4   SampName VARCHAR2(10),
   5   SampDate DATE,
   6   CONSTRAINT SampUNQ02_SampID_UNQ UNIQUE(SampID)
```

```
   7* )
SQL> /

Table created.

SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE SampUNQ03
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SampUNQ03_SampID_UNQ UNIQUE,
  5   SampName VARCHAR2(10)
  6   CONSTRAINT SampUNQ03_SampName_UNQ UNIQUE,
  7   SampDate DATE
  8* )
SQL> /

Table created.

SQL> INSERT INTO SampUNQ03
  2  VALUES(1, 'SAMPLE01', SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ03
  2  VALUES(2, 'SAMPLE01', SYSDATE);
INSERT INTO SampUNQ03
*
ERROR at line 1:
ORA-00001: unique constraint (SCOTT.SAMPUNQ03_SAMPNAME_UNQ) violated


SQL> INSERT INTO SampUNQ03
  2  VALUES(1, 'SAMPLE02', SYSDATE);
INSERT INTO SampUNQ03
*
ERROR at line 1:
ORA-00001: unique constraint (SCOTT.SAMPUNQ03_SAMPID_UNQ) violated


SQL> INSERT INTO SampUNQ03
  2  VALUES(2, 'SAMPLE02', SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ03
  2  VALUES(NULL, 'SAMPLE03', SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ03
  2  VALUES(NULL, 'SAMPLE04', SYSDATE);

1 row created.
```

```
SQL> INSERT INTO SampUNQ03
  2  VALUES(3, NULL, SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ03
  2  VALUES(4, NULL, SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ03
  2  VALUES(NULL, NULL, SYSDATE);

1 row created.

SQL> cl scr

SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE SampUNQ04
  2  (
  3   SampID NUMBER(2),
  4   SampName VARCHAR2(10),
  5   SampDate DATE,
  6   CONSTRAINT SampUNQ04_SampID_UNQ UNIQUE(SampID),
  7   CONSTRAINT SampUNQ04_SampName_UNQ UNIQUE(SampName)
  8* )
SQL> /

Table created.

SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE SampUNQ05
  2  (
  3   SampID NUMBER(2),
  4   SampName VARCHAR2(10),
  5   SampDate DATE,
  6   CONSTRAINT SampUNQ05_SampIDName_UNQ
  7   UNIQUE(SampID, SampName)
  8* )
SQL> /

Table created.

SQL> INSERT INTO SampUNQ05
  2  VALUES(1, 'SAMPLE01', SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ05
  2  VALUES(1, 'SAMPLE02', SYSDATE);
```

```
1 row created.

SQL> INSERT INTO SampUNQ05
  2  VALUES(2, 'SAMPLE02', SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ05
  2  VALUES(NULL, 'SAMPLE03', SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ05
  2  VALUES(NULL, 'SAMPLE04', SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ05
  2  VALUES(NULL, 'SAMPLE04', SYSDATE);
INSERT INTO SampUNQ05
*
ERROR at line 1:
ORA-00001: unique constraint (SCOTT.SAMPUNQ05_SAMPIDNAME_UNQ) violated


SQL> INSERT INTO SampUNQ05
  2  VALUES(NULL, NULL, SYSDATE);

1 row created.

SQL> INSERT INTO SampUNQ05
  2  VALUES(NULL, NULL, SYSDATE);

1 row created.

SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE SampUNQ06
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SampUNQ06_SampID_UNQ UNIQUE,
  5   SampName VARCHAR2(10),
  6   SampDate DATE,
  7   CONSTRAINT SampUNQ06_SampIDName_UNQ
  8   UNIQUE(SampID, SampName)
  9* )
SQL> /

Table created.

SQL> SPOOL OFF
SQL> cl scr
```

```
SQL> CREATE TABLE SamplePK01
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SamplePK01_SampID_PK PRIMARY KEY,
  5   SampName VARCHAR2(10),
  6   SampDate DATE
  7  );

Table created.

SQL> DESC SamplePK01
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 SAMPID                                    NOT NULL NUMBER(2)
 SAMPNAME                                           VARCHAR2(10)
 SAMPDATE                                           DATE

SQL> INSERT INTO SamplePK01
  2  VALUES(1, 'SAMPLE01', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK01
  2  VALUES(1, 'SAMPLE02', SYSDATE);
INSERT INTO SamplePK01
*
ERROR at line 1:
ORA-00001: unique constraint (SCOTT.SAMPLEPK01_SAMPID_PK) violated


SQL> INSERT INTO SamplePK01
  2  VALUES(NULL, 'SAMPLE02', SYSDATE);
VALUES(NULL, 'SAMPLE02', SYSDATE)
       *
ERROR at line 2:
ORA-01400: cannot insert NULL into ("SCOTT"."SAMPLEPK01"."SAMPID")


SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE SamplePK02
  2  (
  3   SampID NUMBER(2),
  4   SampName VARCHAR2(10),
  5   SampDate DATE,
  6   CONSTRAINT SamplePK02_SampID_PK
  7   PRIMARY KEY(SampID)
  8* )
SQL> /

Table created.

SQL> ED
Wrote file afiedt.buf
```

```
   1   CREATE TABLE SamplePK03
   2   (
   3    SampID NUMBER(2),
   4    SampName VARCHAR2(10)
   5    CONSTRAINT SamplePK03_SampName_PK PRIMARY KEY,
   6    SampDate DATE,
   7    CONSTRAINT SamplePK03_SampID_PK
   8    PRIMARY KEY(SampID)
   9* )
SQL> /
 PRIMARY KEY(SampID)
 *
ERROR at line 8:
ORA-02260: table can have only one primary key


SQL> ED
Wrote file afiedt.buf

   1   CREATE TABLE SamplePK03
   2   (
   3    SampID NUMBER(2),
   4    SampName VARCHAR2(10)
   5    CONSTRAINT SamplePK03_SampName_NN NOT NULL
   6    CONSTRAINT SamplePK03_SampName_UNQ UNIQUE,
   7    SampDate DATE,
   8    CONSTRAINT SamplePK03_SampID_PK
   9    PRIMARY KEY(SampID)
  10* )
SQL> /

Table created.

SQL> ED
Wrote file afiedt.buf

   1   CREATE TABLE SamplePK04
   2   (
   3    SampID NUMBER(2),
   4    SampName VARCHAR2(10)
   5    CONSTRAINT SamplePK04_SampName_NN NOT NULL,
   6    SampDate DATE,
   7    CONSTRAINT SamplePK04_SampID_PK
   8    PRIMARY KEY(SampID),
   9    CONSTRAINT SamplePK04_SampName_UNQ
  10    UNIQUE(SampName)
  11* )
SQL> /

Table created.

SQL> CREATE TABLE SamplePK05
   2   (
   3    SampID NUMBER(2),
```

```
    4    SampName VARCHAR2(10),
    5    SampDate DATE,
    6    CONSTRAINT SamplePK05_SampIDName_PK
    7    PRIMARY KEY(SampID, SammName)
    8    );
 PRIMARY KEY(SampID, SammName)
                          *
ERROR at line 7:
ORA-00904: "SAMMNAME": invalid identifier


SQL> ED
Wrote file afiedt.buf

    1   CREATE TABLE SamplePK05
    2   (
    3    SampID NUMBER(2),
    4    SampName VARCHAR2(10),
    5    SampDate DATE,
    6    CONSTRAINT SamplePK05_SampIDName_PK
    7    PRIMARY KEY(SampID, SampName)
    8*  )
SQL> /

Table created.

SQL> INSERT INTo SamplePK05
  2   VALUES(1, 'SAMPLE01', SYSDATE);

1 row created.

SQL> INSERT INTo SamplePK05
  2   VALUES(1, 'SAMPLE02', SYSDATE);

1 row created.

SQL> INSERT INTo SamplePK05
  2   VALUES(2, 'SAMPLE02', SYSDATE);

1 row created.

SQL> INSERT INTo SamplePK05
  2   VALUES(NULL, 'SAMPLE03', SYSDATE);
VALUES(NULL, 'SAMPLE03', SYSDATE)
        *
ERROR at line 2:
ORA-01400: cannot insert NULL into ("SCOTT"."SAMPLEPK05"."SAMPID")


SQL> INSERT INTo SamplePK05
  2   VALUES(3, NULL, SYSDATE);
VALUES(3, NULL, SYSDATE)
           *
ERROR at line 2:
ORA-01400: cannot insert NULL into ("SCOTT"."SAMPLEPK05"."SAMPNAME")
```

```
SQL> cl scr

SQL> ED
Wrote file afiedt.buf

  1   CREATE TABLE SamplePK06
  2   (
  3    SampID NUMBER(2)
  4    CONSTRAINT SamplePK06_SampID_UNQ UNIQUE,
  5    SampName VARCHAR2(10),
  6    SampDate DATE,
  7    CONSTRAINT SamplePK06_SampID_PK
  8    PRIMARY KEY(SampID)
  9* )
SQL> /
 CONSTRAINT SamplePK06_SampID_UNQ UNIQUE,
 *
ERROR at line 4:
ORA-02261: such unique or primary key already exists in the table


SQL> ED
Wrote file afiedt.buf

  1   CREATE TABLE SamplePK06
  2   (
  3    SampID NUMBER(2)
  4    CONSTRAINT SamplePK06_SampID_UNQ UNIQUE,
  5    SampName VARCHAR2(10),
  6    SampDate DATE,
  7    CONSTRAINT SamplePK06_SampIDName_PK
  8    PRIMARY KEY(SampID, SampName)
  9* )
SQL> /

Table created.

SQL> ED
Wrote file afiedt.buf

  1   CREATE TABLE SamplePK07
  2   (
  3    SampID NUMBER(2)
  4    CONSTRAINT SamplePK07_SampID_UNQ UNIQUE,
  5    SampName VARCHAR2(10)
  6    CONSTRAINT SamplePK07_SampName_UNQ UNIQUE,
  7    SampDate DATE,
  8    CONSTRAINT SamplePK07_SampIDName_PK
  9    PRIMARY KEY(SampID, SampName)
 10* )
SQL> /

Table created.
```

```
SQL> ED
Wrote file afiedt.buf

  1   CREATE TABLE SamplePK08
  2   (
  3    SampID NUMBER(2),
  4    SampName VARCHAR2(10),
  5    SampDate DATE,
  6    CONSTRAINT SamplePK08_SampIDName_PK
  7    PRIMARY KEY(SampID, SampName),
  8    CONSTRAINT SamplePK08_SampIDName_UNQ
  9    UNIQUE(SampID, SampName)
 10* )
SQL> /
 UNIQUE(SampID, SampName)
 *
ERROR at line 9:
ORA-02261: such unique or primary key already exists in the table


SQL> SPOOL OFF
SQL> SELECT * FROM TAB;

TNAME                        TABTYPE  CLUSTERID
---------------------------- -------  ----------
SAMPLEPK01                   TABLE
SAMPLEPK02                   TABLE
SAMPLEPK03                   TABLE
SAMPLEPK04                   TABLE
SAMPLEPK05                   TABLE
SAMPLEPK06                   TABLE
SAMPLEPK07                   TABLE
EMPLOYEES                    VIEW
EMPINFO                      VIEW
EMPGRADES                    VIEW
EMPMANAGERS                  VIEW


TNAME                        TABTYPE  CLUSTERID
---------------------------- -------  ----------
EMPACCOUNTS                  VIEW
CUMSUM                       VIEW
ORGDESIGNATIONS              VIEW
DEPT                         TABLE
EMP                          TABLE
BONUS                        TABLE
SALGRADE                     TABLE
DUMMY                        TABLE
CUSTOMER                     TABLE
ORD                          TABLE
ITEM                         TABLE


TNAME                        TABTYPE  CLUSTERID
---------------------------- -------  ----------
PRODUCT                      TABLE
```

```
PRICE                          TABLE
SALES                          VIEW

25 rows selected.

SQL> SPOOL OFF
SQL> cl scr

SQL> CREATE TABLE MyDept
  2  (
  3   Deptno NUMBER(2)
  4   CONSTRAINT MyDept_Deptno_PK PRIMARY KEY,
  5   Dname VARCHAR2(16)
  6   CONSTRAINT MyDept_Dname_NN NOT NULL,
  7   Loc VARCHAR2(16)
  8   CONSTRAINT MyDept_Loc_NN NOT NULL
  9  );

Table created.

SQL> CREATE TABLE MyEmp
  2  (
  3   Empno NUMBER(4)
  4   CONSTRAINT MyEmp_Empno_PK PRIMARY KEY,
  5   Ename VARCHAR2(10)
  6   CONSTRAINT MyEmp_Ename_NN NOT NULL,
  7   Job VARCHAR2(14)
  8   CONSTRAINT MyEmp_Job_NN NOT NULL,
  9   HireDate DATE
 10   CONSTRAINT MyEmp_HireDate_NN NOT NULL,
 11   MGR NUMBER(4)
 12   CONSTRAINT MyEmp_MGR_FK
 13   REFERENCES MyEmp(Empno)
 14   ON DELETE SET NULL,
 15   Sal NUMBER(7, 2)
 16   CONSTRAINT MyEmp_Sal_NN NOT NULL,
 17   Comm NUMBER(7, 2),
 18   DeptID NUMBER(2)
 19   CONSTRAINT MyEmp_DeptID_NN NOT NULL
 20   CONSTRAINT MyEmp_DeptID_FK
 21   REFERENCES MyDept(Deptno)
 22   ON DELETE CASCADE
 23  );

Table created.

SQL> DESC Dept
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 DEPTNO                                    NOT NULL NUMBER(2)
 DNAME                                              VARCHAR2(14)
 LOC                                               VARCHAR2(13)

SQL> DESC MyDept
 Name                                      Null?    Type
```

```
------------------------------------------ -------- ----------------------------
 DEPTNO                                     NOT NULL NUMBER(2)
 DNAME                                      NOT NULL VARCHAR2(16)
 LOC                                        NOT NULL VARCHAR2(16)

SQL> DESC Emp
 Name                                       Null?    Type
------------------------------------------ -------- ----------------------------
 EMPNO                                      NOT NULL NUMBER(4)
 ENAME                                               VARCHAR2(10)
 JOB                                                 VARCHAR2(9)
 MGR                                                 NUMBER(4)
 HIREDATE                                            DATE
 SAL                                                 NUMBER(7,2)
 COMM                                                NUMBER(7,2)
 DEPTNO                                     NOT NULL NUMBER(2)

SQL> DESC MyEmp
 Name                                       Null?    Type
------------------------------------------ -------- ----------------------------
 EMPNO                                      NOT NULL NUMBER(4)
 ENAME                                      NOT NULL VARCHAR2(10)
 JOB                                        NOT NULL VARCHAR2(14)
 HIREDATE                                   NOT NULL DATE
 MGR                                                 NUMBER(4)
 SAL                                        NOT NULL NUMBER(7,2)
 COMM                                                NUMBER(7,2)
 DEPTID                                     NOT NULL NUMBER(2)

SQL> INSERT INTO MyEmp
  2  VALUES(1230, 'SAMPLE01', 'MANAGER', SYSDATE,
  3
SQL> cl scr

SQL> CREATE TABLE SamplePK01
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SamplePK01_SampID_PK PRIMARY KEY,
  5   SampName VARCHAR2(10),
  6   SampDate DATE
  7  );

Table created.

SQL> CREATE TABLE SampleFK01
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SampleFK01_SampID_PK PRIMARY KEY,
  5   SampName VARCHAR2(10),
  6   SampDate DATE,
  7   SampIDFK NUMBER(2)
  8   CONSTRAINT SampleFK01_SampIDFK_FK
  9   REFERENCES SamplePK01(SampID)
 10  );
```

```
Table created.

SQL> INSERT INTO SampleFK01
  2  VALUES(20, 'SAMPLE20', SYSDATE, NULL);

1 row created.

SQL> INSERT INTO SamplePK01
  2  VALUES(10, 'SAMPLE10', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK01
  2  VALUES(11, 'SAMPLE11', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK01
  2  VALUES(12, 'SAMPLE12', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK01
  2  VALUES(13, 'SAMPLE13', SYSDATE);

1 row created.

SQL> INSERT INTO SampleFK01
  2  VALUES(21, 'SAMPLE21', SYSDATE, 10);

1 row created.

SQL> INSERT INTO SampleFK01
  2  VALUES(22, 'SAMPLE22', SYSDATE, 15);
INSERT INTO SampleFK01
*
ERROR at line 1:
ORA-02291: integrity constraint (SCOTT.SAMPLEFK01_SAMPIDFK_FK) violated -
parent key not found


SQL> INSERT INTO SampleFK01
  2  VALUES(22, 'SAMPLE22', SYSDATE, 10);

1 row created.

SQL> INSERT INTO SampleFK01
  2  VALUES(23, 'SAMPLE23', SYSDATE, 12);

1 row created.

SQL> SELECT * FROM SamplePK01;

    SAMPID SAMPNAME    SAMPDATE
---------- ---------- ---------
```

```
        10 SAMPLE10    23-JUN-10
        11 SAMPLE11    23-JUN-10
        12 SAMPLE12    23-JUN-10
        13 SAMPLE13    23-JUN-10

SQL> SELECT * FROM SampleFK01;

    SAMPID SAMPNAME    SAMPDATE    SAMPIDFK
---------- ---------- --------- ----------
        20 SAMPLE20    23-JUN-10
        21 SAMPLE21    23-JUN-10            10
        22 SAMPLE22    23-JUN-10            10
        23 SAMPLE23    23-JUN-10            12

SQL> DELETE FROM SamplePK01
  2  WHERE SampID = 13;

1 row deleted.

SQL> DELETE FROM SamplePK01
  2  WHERE SampID = 12;
DELETE FROM SamplePK01
*
ERROR at line 1:
ORA-02292: integrity constraint (SCOTT.SAMPLEFK01_SAMPIDFK_FK) violated - child
record found


SQL> DELETE FROM SampleFK01
  2  WHERE SampID = 23;

1 row deleted.

SQL> cl scr

SQL> CREATE TABLE SamplePK02
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SamplePK02_SampID_PK PRIMARY KEY,
  5   SampName VARCHAR2(10),
  6   SampDate DATE
  7  );

Table created.

SQL> CREATE TABLE SampleFK02
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SampleFK02_SampID_PK PRIMARY KEY,
  5   SampName VARCHAR2(10),
  6   SampDate DATE,
  7   SampIDFK NUMBER(2)
  8   CONSTRAINT SampleFK02_SampIDFK_FK
  9   REFERENCES SamplePK02(SampID)
 10   ON DELETE SET NULL
```

```
  11  );

Table created.

SQL> INSERT INTO SamplePK02
  2  VALUES(1, 'SAMPLE01', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK02
  2  VALUES(2, 'SAMPLE02', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK02
  2  VALUES(3, 'SAMPLE03', SYSDATE);

1 row created.

SQL> INSERT INTO SampleFK02
  2  VALUES(10, 'SAMPLE10', SYSDATE, 1);

1 row created.

SQL> INSERT INTO SampleFK02
  2  VALUES(11, 'SAMPLE11', SYSDATE, 2);

1 row created.

SQL> INSERT INTO SampleFK02
  2  VALUES(12, 'SAMPLE12', SYSDATE, 2);

1 row created.

SQL> INSERT INTO SampleFK02
  2  VALUES(13, 'SAMPLE13', SYSDATE, 2);

1 row created.

SQL> SELECT * FROM SamplePK02;

    SAMPID SAMPNAME   SAMPDATE
---------- ---------- ---------
         1 SAMPLE01   23-JUN-10
         2 SAMPLE02   23-JUN-10
         3 SAMPLE03   23-JUN-10

SQL> SELECT * FROM SampleFK02;

    SAMPID SAMPNAME   SAMPDATE   SAMPIDFK
---------- ---------- --------- ----------
        10 SAMPLE10   23-JUN-10          1
        11 SAMPLE11   23-JUN-10          2
        12 SAMPLE12   23-JUN-10          2
        13 SAMPLE13   23-JUN-10          2
```

```
SQL> DELETE FROM SamplePK02
  2  WHERE SampID = 2;

1 row deleted.

SQL> SELECT * FROM SampleFK02;

    SAMPID SAMPNAME   SAMPDATE    SAMPIDFK
---------- ---------- --------- ----------
        10 SAMPLE10   23-JUN-10           1
        11 SAMPLE11   23-JUN-10
        12 SAMPLE12   23-JUN-10
        13 SAMPLE13   23-JUN-10

SQL> cl scr

SQL> CREATE TABLE SamplePK03
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SamplePK03_SampID_PK PRIMARY KEY,
  5   SampName VARCHAR2(10),
  6   SampDate DATE
  7  );

Table created.

SQL> CREATE TABLE SampleFK03_1
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SampleFK03_1_SampID_PK PRIMARY KEY,
  5   SampName VARCHAR2(10),
  6   SampDate DATE,
  7   SampIDFK NUMBER(2)
  8   CONSTRAINT SampleFK03_1_SampIDFK_FK
  9   REFERENCES SamplePK03(SampID)
 10   ON DELETE CASCADE
 11  );

Table created.

SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE SampleFK03_2
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SampleFK03_2_SampID_PK PRIMARY KEY,
  5   SampName VARCHAR2(10),
  6   SampDate DATE,
  7   SampIDFK NUMBER(2)
  8   CONSTRAINT SampleFK03_2_SampIDFK_FK
  9   REFERENCES SamplePK03(SampID)
 10   ON DELETE SET NULL
 11* )
```

```
SQL> /

Table created.

SQL> INSERT INTO SamplePK03
  2  VALUES(10, 'SAMPLE10', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK03
  2  VALUES(11, 'SAMPLE11', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK03
  2  VALUES(12, 'SAMPLE12', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK03
  2  VALUES(13, 'SAMPLE13', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK03
  2  VALUES(14, 'SAMPLE14', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK03
  2  VALUES(15, 'SAMPLE15', SYSDATE);

1 row created.

SQL> INSERT INTO SamplePK03
  2  VALUES(16, 'SAMPLE16', SYSDATE);

1 row created.

SQL> COMMIT;

Commit complete.

SQL> INSERT INTO SampleFK03_1
  2  VALUES(20, 'SAMPLE20', SYSDATE, 10);

1 row created.

SQL> INSERT INTO SampleFK03_1
  2  VALUES(21, 'SAMPLE21', SYSDATE, 10);

1 row created.

SQL> INSERT INTO SampleFK03_1
  2  VALUES(22, 'SAMPLE22', SYSDATE, 10);
```

```
1 row created.

SQL> INSERT INTO SampleFK03_1
  2  VALUES(23, 'SAMPLE23', SYSDATE, 12);

1 row created.

SQL> INSERT INTO SampleFK03_1
  2  VALUES(24, 'SAMPLE24', SYSDATE, 12);

1 row created.

SQL> INSERT INTO SampleFK03_1
  2  VALUES(25, 'SAMPLE25', SYSDATE, 13);

1 row created.

SQL> INSERT INTO SampleFK03_1
  2  VALUES(26, 'SAMPLE26', SYSDATE, 13);

1 row created.

SQL> INSERT INTO SampleFK03_1
  2  VALUES(27, 'SAMPLE27', SYSDATE, 13);

1 row created.

SQL> INSERT INTO SampleFK03_1
  2  VALUES(28, 'SAMPLE28', SYSDATE, 15);

1 row created.

SQL> INSERT INTO SampleFK03_2
  2  VALUES(30, 'SAMPLE30', SYSDATE, 10);

1 row created.

SQL> INSERT INTO SampleFK03_2
  2  VALUES(31, 'SAMPLE31', SYSDATE, 10);

1 row created.

SQL> INSERT INTO SampleFK03_2
  2  VALUES(32, 'SAMPLE32', SYSDATE, 11);

1 row created.

SQL> INSERT INTO SampleFK03_2
  2  VALUES(33, 'SAMPLE33', SYSDATE, 11);

1 row created.

SQL> INSERT INTO SampleFK03_2
  2  VALUES(34, 'SAMPLE34', SYSDATE, 14);
```

```
1 row created.

SQL> INSERT INTO SampleFK03_2
  2  VALUES(35, 'SAMPLE35', SYSDATE, 14);

1 row created.

SQL> INSERT INTO SampleFK03_2
  2  VALUES(36, 'SAMPLE36', SYSDATE, 14);

1 row created.

SQL> INSERT INTO SampleFK03_2
  2  VALUES(37, 'SAMPLE37', SYSDATE, 15);

1 row created.

SQL> COMMIT;

Commit complete.

SQL> cl scr

SQL> SELECT * FROM SamplePK03;

    SAMPID SAMPNAME    SAMPDATE
---------- ---------- ---------
        10 SAMPLE10    23-JUN-10
        11 SAMPLE11    23-JUN-10
        12 SAMPLE12    23-JUN-10
        13 SAMPLE13    23-JUN-10
        14 SAMPLE14    23-JUN-10
        15 SAMPLE15    23-JUN-10
        16 SAMPLE16    23-JUN-10

7 rows selected.

SQL> SELECT * FROM SampleFK03_1;

    SAMPID SAMPNAME    SAMPDATE    SAMPIDFK
---------- ---------- --------- ----------
        20 SAMPLE20    23-JUN-10          10
        21 SAMPLE21    23-JUN-10          10
        22 SAMPLE22    23-JUN-10          10
        23 SAMPLE23    23-JUN-10          12
        24 SAMPLE24    23-JUN-10          12
        25 SAMPLE25    23-JUN-10          13
        26 SAMPLE26    23-JUN-10          13
        27 SAMPLE27    23-JUN-10          13
        28 SAMPLE28    23-JUN-10          15

9 rows selected.

SQL> SELECT * FROM SampleFK03_2;
```

```
    SAMPID SAMPNAME    SAMPDATE    SAMPIDFK
---------- ---------- --------- ----------
        30 SAMPLE30   23-JUN-10          10
        31 SAMPLE31   23-JUN-10          10
        32 SAMPLE32   23-JUN-10          11
        33 SAMPLE33   23-JUN-10          11
        34 SAMPLE34   23-JUN-10          14
        35 SAMPLE35   23-JUN-10          14
        36 SAMPLE36   23-JUN-10          14
        37 SAMPLE37   23-JUN-10          15

8 rows selected.

SQL> DELETE FROM SamplePK03
  2  WHERE SampID = 16;

1 row deleted.

SQL> DELETE FROM SamplePK03
  2  WHERE SampID = 12;

1 row deleted.

SQL> SELECT * FROM SamplePK03;

    SAMPID SAMPNAME    SAMPDATE
---------- ---------- ---------
        10 SAMPLE10   23-JUN-10
        11 SAMPLE11   23-JUN-10
        13 SAMPLE13   23-JUN-10
        14 SAMPLE14   23-JUN-10
        15 SAMPLE15   23-JUN-10

SQL> SELECT * FROM SampleFK03_1;

    SAMPID SAMPNAME    SAMPDATE    SAMPIDFK
---------- ---------- --------- ----------
        20 SAMPLE20   23-JUN-10          10
        21 SAMPLE21   23-JUN-10          10
        22 SAMPLE22   23-JUN-10          10
        25 SAMPLE25   23-JUN-10          13
        26 SAMPLE26   23-JUN-10          13
        27 SAMPLE27   23-JUN-10          13
        28 SAMPLE28   23-JUN-10          15

7 rows selected.

SQL> DELETE FROM SamplePK03
  2  WHERE SampID = 14;

1 row deleted.

SQL> SELECT * FROM SampleFK03_2;
```

```
     SAMPID SAMPNAME   SAMPDATE    SAMPIDFK
---------- ---------- --------- ----------
        30 SAMPLE30   23-JUN-10          10
        31 SAMPLE31   23-JUN-10          10
        32 SAMPLE32   23-JUN-10          11
        33 SAMPLE33   23-JUN-10          11
        34 SAMPLE34   23-JUN-10
        35 SAMPLE35   23-JUN-10
        36 SAMPLE36   23-JUN-10
        37 SAMPLE37   23-JUN-10          15

8 rows selected.

SQL> DELETE FROM SamplePK03
  2  WHERE SampID = 10;

1 row deleted.

SQL> SELECT * FROM SampleFK03_1;

     SAMPID SAMPNAME   SAMPDATE    SAMPIDFK
---------- ---------- --------- ----------
        25 SAMPLE25   23-JUN-10          13
        26 SAMPLE26   23-JUN-10          13
        27 SAMPLE27   23-JUN-10          13
        28 SAMPLE28   23-JUN-10          15

SQL> SELECT * FROM SampleFK03_2;

     SAMPID SAMPNAME   SAMPDATE    SAMPIDFK
---------- ---------- --------- ----------
        30 SAMPLE30   23-JUN-10
        31 SAMPLE31   23-JUN-10
        32 SAMPLE32   23-JUN-10          11
        33 SAMPLE33   23-JUN-10          11
        34 SAMPLE34   23-JUN-10
        35 SAMPLE35   23-JUN-10
        36 SAMPLE36   23-JUN-10
        37 SAMPLE37   23-JUN-10          15

8 rows selected.

SQL> cl scr

SQL> CREATE TABLE SamplePK04Self
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SamplePK04Self_SampIDPK PRIMARY KEY,
  5   SampName VARCHAR2(10),
  6   SampDate DATE,
  7   SampIDFK NUMBER(2)
  8   CONSTRAINT SamplePK04Self_SampIDFK
  9   REFERENCES SamplePK04Self(SampID)
 10   ON DELETE SET NULL
 11  );
```

```
Table created.

SQL> INSERT INTO SamplePK04Self
  2  VALUES(1, 'SAMPLE01', SYSDATE, NULL);

1 row created.

SQL> INSERT INTO SamplePK04Self
  2  VALUES(2, 'SAMPLE02', SYSDATE, 1);

1 row created.

SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE SamplePK04Self1
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SamplePK04Self1_SampIDPK PRIMARY KEY,
  5   SampName VARCHAR2(10),
  6   SampDate DATE,
  7   SampIDFK NUMBER(2)
  8   CONSTRAINT SamplePK04Self1_SampIDNN NOT NULL
  9   CONSTRAINT SamplePK04Self1_SampIDFK
 10   REFERENCES SamplePK04Self1(SampID)
 11   ON DELETE CASCADE
 12* )
SQL> /

Table created.

SQL> INSERT INTO SamplePK04Self1
  2  VALUES(1, 'SAMPLE01', SYSDATE, NULL);
VALUES(1, 'SAMPLE01', SYSDATE, NULL)
                                  *
ERROR at line 2:
ORA-01400: cannot insert NULL into ("SCOTT"."SAMPLEPK04SELF1"."SAMPIDFK")


SQL> INSERT INTO SamplePK04Self1
  2  VALUES(1, 'SAMPLE01', SYSDATE, 1);

1 row created.

SQL> INSERT INTO SamplePK04Self1
  2  VALUES(2, 'SAMPLE02', SYSDATE, 1);

1 row created.

SQL> cl scr

SQL> SELECT * FROM TAB;

TNAME                           TABTYPE  CLUSTERID
```

```
---------------------------- ------- ----------
DEPT                         TABLE
EMP                          TABLE
BONUS                        TABLE
SALGRADE                     TABLE
DUMMY                        TABLE
CUSTOMER                     TABLE
ORD                          TABLE
ITEM                         TABLE
PRODUCT                      TABLE
PRICE                        TABLE
EMPLOYEES                    VIEW

TNAME                        TABTYPE   CLUSTERID
---------------------------- ------- ----------
EMPINFO                      VIEW
EMPGRADES                    VIEW
EMPMANAGERS                  VIEW
EMPACCOUNTS                  VIEW
CUMSUM                       VIEW
ORGDESIGNATIONS              VIEW
SALES                        VIEW
MYDEPT                       TABLE
MYEMP                        TABLE
SAMPLEPK01                   TABLE
SAMPLEFK01                   TABLE

TNAME                        TABTYPE   CLUSTERID
---------------------------- ------- ----------
SAMPLEPK02                   TABLE
SAMPLEFK02                   TABLE
SAMPLEPK03                   TABLE
SAMPLEFK03_1                 TABLE
SAMPLEFK03_2                 TABLE
SAMPLEPK04SELF               TABLE
SAMPLEPK04SELF1              TABLE

29 rows selected.

SQL> cl scr

SQL> CREATE TABLE SamplePK04
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SamplePK04_SampID_PK PRIMARY KEY,
  5   SampName VARCHAR2(10),
  6   SampDate DATE
  7  );

Table created.

SQL> CREATE TABLE SampleFK04
  2  (
  3   SampID NUMBER(2)
  4   CONSTRAINT SampleFK04_SampID_FK
```

```
   5    REFERENCES SamplePK04(SampID),
   6    SampName VARCHAR2(10),
   7    SampDate DATE,
   8    CONSTRAINT SampleFK04_SampID_PK
   9    PRIMARY KEY(SampID)
  10  );

Table created.

SQL> CREATE TABLE SampleFK04_1
   2  (
   3   SampID NUMBER(2)
   4   CONSTRAINT SampleFK04_1_SampID_FK
   5   REFERENCES SampleFK04(SampID),
   6   SampName VARCHAR2(10)
   7  );

Table created.

SQL> cl scr

SQL> CREATE TABLE SampleCKPK01
   2  (
   3    SampID NUMBER(2)
   4   ,SampName VARCHAR2(10)
   5   ,SampDate DATE
   6   ,CONSTRAINT SampleCKPK01_SampIDName_CKPK
   7    PRIMARY KEY(SampID, SampName)
   8  );

Table created.

SQL> CREATE TABLE SampleCKFK01
   2  (
   3   SampID NUMBER(2),
   4   SampName VARCHAR2(10),
   5   SampDate DATE,
   6   CONSTRAINT SampleCKFK01_SampIDNameCKFK
   7   FOREIGN KEY(SampID, SampName)
   8   REFERENCES SampleCKPK01(SampID, SampName)
   9  );

Table created.

SQL> cl scr

SQL> CREATE TABLE SamplePKUNQ
   2  (
   3   SampIDPK NUMBER(2)
   4   CONSTRAINT SamplePKUNQ_SampIDPK_PK PRIMARY KEY,
   5   SampIDUNQ1 NUMBER(2)
   6   CONSTRAINT SamplePKUNQ_SampIDUNQ_UNQ UNIQUE,
   7   SampDate DATE
   8  );
```

```
Table created.

SQL> CREATE TABLE SampleFK
  2  (
  3   SampIDFKPK NUMBER(2)
  4   CONSTRAINT SampleFK_SampIDFKPK_FK
  5   REFERENCES SamplePKUNQ(SampIDPK),
  6   SampIDFKUNQ NUMBER(2)
  7   CONSTRAINT SampleFK_SampIDFKUNQ_FK
  8   REFERENCES SamplePKUNQ(SampIDUNQ1)
  9  );

Table created.

SQL> SPOOL OFF
SQL> cl scr

SQL> CREATE TABLE MyDept
  2  (
  3   Deptno NUMBER(2)
  4   CONSTRAINT MyDept_Deptno_PK PRIMARY KEY
  5   CONSTRAINT MyDept_Deptno_CHK01
  6   CHECK(Deptno IN(10, 20, 30, 40, 50, 60, 70, 80, 90)),
  7   DName VARCHAR2(16)
  8   CONSTRAINT MyDept_DName_NN  NOT NULL
  9   DEFAULT 'NOT GIVEN'
 10   CONSTRAINT MyDept_DName_UNQ UNIQUE
 11   CONSTRAINT MyDept_DName_CHK01
 12   CHECK(DName = UPPER(DName)),
 13   Loc VARCHAR2(14)
 14   CONSTRAINT MyDept_Loc_NN NOT NULL
 15   DEFAULT 'NOT GIVEN'
 16   CONSTRAINT MyDept_Loc_CHK01
 17   CHECK(Loc IN('NEW YORK', 'BOSTON', 'CHICAGO', 'DALLAS'))
 18  );
 DEFAULT 'NOT GIVEN'
 *
ERROR at line 9:
ORA-00907: missing right parenthesis


SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE MyDept
  2  (
  3   Deptno NUMBER(2)
  4   CONSTRAINT MyDept_Deptno_PK PRIMARY KEY
  5   CONSTRAINT MyDept_Deptno_CHK01
  6   CHECK(Deptno IN(10, 20, 30, 40, 50, 60, 70, 80, 90)),
  7   DName VARCHAR2(16)
  8   CONSTRAINT MyDept_DName_NN  NOT NULL
  9   DEFAULT 'NOT GIVEN')
 10   CONSTRAINT MyDept_DName_UNQ UNIQUE
 11   CONSTRAINT MyDept_DName_CHK01
```

```
 12    CHECK(DName = UPPER(DName)),
 13    Loc VARCHAR2(14)
 14    CONSTRAINT MyDept_Loc_NN NOT NULL
 15    DEFAULT 'NOT GIVEN'
 16    CONSTRAINT MyDept_Loc_CHK01
 17    CHECK(Loc IN('NEW YORK', 'BOSTON', 'CHICAGO', 'DALLAS'))
 18* )
SQL> /
 DEFAULT 'NOT GIVEN')
 *
ERROR at line 9:
ORA-00907: missing right parenthesis


SQL> ED
Wrote file afiedt.buf

  1   CREATE TABLE MyDept
  2   (
  3    Deptno NUMBER(2)
  4    CONSTRAINT MyDept_Deptno_PK PRIMARY KEY
  5    CONSTRAINT MyDept_Deptno_CHK01
  6    CHECK(Deptno IN(10, 20, 30, 40, 50, 60, 70, 80, 90)),
  7    DName VARCHAR2(16)
  8    CONSTRAINT MyDept_DName_NN  NOT NULL
  9    (DEFAULT 'NOT GIVEN')
 10    CONSTRAINT MyDept_DName_UNQ UNIQUE
 11    CONSTRAINT MyDept_DName_CHK01
 12    CHECK(DName = UPPER(DName)),
 13    Loc VARCHAR2(14)
 14    CONSTRAINT MyDept_Loc_NN NOT NULL
 15    DEFAULT 'NOT GIVEN'
 16    CONSTRAINT MyDept_Loc_CHK01
 17    CHECK(Loc IN('NEW YORK', 'BOSTON', 'CHICAGO', 'DALLAS'))
 18* )
SQL> /
 (DEFAULT 'NOT GIVEN')
 *
ERROR at line 9:
ORA-00907: missing right parenthesis


SQL> ED
Wrote file afiedt.buf

  1   CREATE TABLE MyDept
  2   (
  3    Deptno NUMBER(2)
  4    CONSTRAINT MyDept_Deptno_PK PRIMARY KEY
  5    CONSTRAINT MyDept_Deptno_CHK01
  6    CHECK(Deptno IN(10, 20, 30, 40, 50, 60, 70, 80, 90)),
  7    DName VARCHAR2(16)
  8    DEFAULT 'NOT GIVEN'
  9    CONSTRAINT MyDept_DName_NN  NOT NULL
 10    CONSTRAINT MyDept_DName_UNQ UNIQUE
```

```
 11    CONSTRAINT MyDept_DName_CHK01
 12    CHECK(DName = UPPER(DName)),
 13    Loc VARCHAR2(14)
 14    CONSTRAINT MyDept_Loc_NN NOT NULL
 15    DEFAULT 'NOT GIVEN'
 16    CONSTRAINT MyDept_Loc_CHK01
 17    CHECK(Loc IN('NEW YORK', 'BOSTON', 'CHICAGO', 'DALLAS'))
 18* )
SQL> /
 DEFAULT 'NOT GIVEN'
 *
ERROR at line 15:
ORA-00907: missing right parenthesis


SQL> ED
Wrote file afiedt.buf

  1   CREATE TABLE MyDept
  2   (
  3    Deptno NUMBER(2)
  4    CONSTRAINT MyDept_Deptno_PK PRIMARY KEY
  5    CONSTRAINT MyDept_Deptno_CHK01
  6    CHECK(Deptno IN(10, 20, 30, 40, 50, 60, 70, 80, 90)),
  7    DName VARCHAR2(16)
  8    DEFAULT 'Not Given'
  9    CONSTRAINT MyDept_DName_NN  NOT NULL
 10    CONSTRAINT MyDept_DName_UNQ UNIQUE
 11    CONSTRAINT MyDept_DName_CHK01
 12    CHECK(DName = UPPER(DName)),
 13    Loc VARCHAR2(14)
 14    DEFAULT 'NOT GIVEN'
 15    CONSTRAINT MyDept_Loc_NN NOT NULL
 16    CONSTRAINT MyDept_Loc_CHK01
 17    CHECK(Loc IN('NEW YORK', 'BOSTON', 'CHICAGO', 'DALLAS'))
 18* )
SQL> /

Table created.

SQL> INSERT INTO MyDept
  2  VALUES(1, 'ACCOUNTING', 'NEW YORK');
INSERT INTO MyDept
*
ERROR at line 1:
ORA-02290: check constraint (SCOTT.MYDEPT_DEPTNO_CHK01) violated


SQL> INSERT INTO MyDept
  2  VALUES(10, 'ACCOUNTING', 'NEW YORK');

1 row created.

SQL> INSERT INTO MyDept
  2  VALUES(11, 'ACCOUNTING', 'NEW YORK');
```

```
INSERT INTO MyDept
*
ERROR at line 1:
ORA-02290: check constraint (SCOTT.MYDEPT_DEPTNO_CHK01) violated


SQL> INSERT INTO MyDept
  2  VALUES(20, 'ACCOUNTING', 'NEW YORK');
INSERT INTO MyDept
*
ERROR at line 1:
ORA-00001: unique constraint (SCOTT.MYDEPT_DNAME_UNQ) violated


SQL> INSERT INTO MyDept
  2  VALUES(20, 'RESEARCH', 'BOSTON');

1 row created.

SQL> INSERT INTO MyDept
  2  VALUES(30, 'SALES', 'Chicago');
INSERT INTO MyDept
*
ERROR at line 1:
ORA-02290: check constraint (SCOTT.MYDEPT_LOC_CHK01) violated


SQL> INSERT INTO MyDept
  2  VALUES(30, 'SALES', 'CHICAGO');

1 row created.

SQL> INSERT INTO MyDept
  2  VALUES(40, 'OPERATIONS');
INSERT INTO MyDept
            *
ERROR at line 1:
ORA-00947: not enough values


SQL> INSERT INTO MyDept(Deptno, Loc)
  2  VALUES(50, 'BOSTON');
INSERT INTO MyDept(Deptno, Loc)
*
ERROR at line 1:
ORA-02290: check constraint (SCOTT.MYDEPT_DNAME_CHK01) violated


SQL> INSERT INTO MyDept(Deptno, DName)
  2  VALUES(40, 'OPEARTIONS');
INSERT INTO MyDept(Deptno, DName)
*
ERROR at line 1:
ORA-02290: check constraint (SCOTT.MYDEPT_LOC_CHK01) violated
```

```
SQL> ED
Wrote file afiedt.buf

  1  INSERT INTO MyDept(Deptno, DName)
  2* VALUES(40, 'OPEARTIONS')
SQL> DROP TABLE MyDept;

Table dropped.

SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE MyDept
  2  (
  3   Deptno NUMBER(2)
  4   CONSTRAINT MyDept_Deptno_PK PRIMARY KEY
  5   CONSTRAINT MyDept_Deptno_CHK01
  6   CHECK(Deptno IN(10, 20, 30, 40, 50, 60, 70, 80, 90)),
  7   DName VARCHAR2(16)
  8   DEFAULT 'NOT GIVEN'
  9   CONSTRAINT MyDept_DName_NN  NOT NULL
 10   CONSTRAINT MyDept_DName_UNQ UNIQUE
 11   CONSTRAINT MyDept_DName_CHK01
 12   CHECK(DName = UPPER(DName)),
 13   Loc VARCHAR2(14)
 14   DEFAULT 'NOT GIVEN'
 15   CONSTRAINT MyDept_Loc_NN NOT NULL
 16   CONSTRAINT MyDept_Loc_CHK01
 17   CHECK(Loc IN('NEW YORK', 'BOSTON', 'CHICAGO', 'DALLAS', 'NOT GIVEN'))
 18* )
SQL> /

Table created.

SQL> INSERT INTO MyDept(Deptno, DName)
  2  VALUES(10, 'OPERATIONS');

1 row created.

SQL> INSERT INTO MyDept(Deptno, Loc)
  2  VALUES(20, 'BOSTON');

1 row created.

SQL> SELECT * FROM MyDept;

    DEPTNO DNAME            LOC
---------- ---------------- --------------
        10 OPERATIONS       NOT GIVEN
        20 NOT GIVEN        BOSTON

SQL> INSERT INTO MyDept(Deptno, DName)
  2  VALUES(30, 'ACCOUNTING');
```

```
1 row created.

SQL> SELECT * FROM MyDept;

    DEPTNO DNAME           LOC
---------- --------------- --------------
        10 OPERATIONS      NOT GIVEN
        20 NOT GIVEN       BOSTON
        30 ACCOUNTING      NOT GIVEN

SQL> INSERT INTO MyDept(Deptno, DName)
  2
SQL> INSERT INTO MyDept(Deptno, Loc)
  2  VALUES(40, 'CHICAGO');
INSERT INTO MyDept(Deptno, Loc)
*
ERROR at line 1:
ORA-00001: unique constraint (SCOTT.MYDEPT_DNAME_UNQ) violated


SQL> cl scr

SQL> CREATE TABLE MyEmp
  2  (
  3   Empno NUMBER(4)
  4   CONSTRAINT MyEmp_Empno_PK PRIMARY KEY
  5   CONSTRAINT MyEmp_Empno_CHK01
  6   CHECK(Empno >= 1000 AND Empno <= 4000),
  7   Ename VARCHAR2(10)
  8   DEFAULT 'NOT GIVEN'
  9   CONSTRAINT MyEmp_Ename_NN NOT NULL
 10   CONSTRAINT MyEmp_Ename_CHK01
 11   CHECK(EName = UPPER(EName)),
 12   Job VARCHAR2(14)
 13   DEFAULT 'NOT GIVEN'
 14   CONSTRAINT MyEmp_Job_NN NOT NULL
 15   CONSTRAINT MyEmp_Job_CHK01
 16   CHECK(Job IN('PRESIDENT', 'MANAGER', 'ANALYST', 'SALESMAN', 'CLERK', 'NOT
GIVEN')),
 17   MGR NUMBER(4)
 18   CONSTRAINT MyEmp_MGR_CHK01
 19   CHECK(MGR >= 1000 AND MGR <= 4000),
 20   Sal NUMBER(7, 2)
 21   CONSTRAINT MyEmp_Sal_NN NOT NULL
 22   CONSTRAINT MyEmp_Sal_CHK01
 23   CHECK(Sal BETWEEN 1000 AND 90000),
 24   Comm NUMBER(7, 2),
 25   HireDate DATE
 26   DEFAULT SYSDATE
 27   CONSTRAINT MyEmp_HireDate_NN NOT NULL,
 28   Deptno NUMBER(2)
 29   CONSTRAINT MyEmp_Deptno_NN NOT NULL
 30   CONSTRAINT MyEmp_Deptno_CHK
 31   CHECK(Deptno IN(10, 20, 30, 40, 50, 60, 70, 80, 90))
 32   CONSTRAINT MyEmp_Deptno_FK
```

```
 33    RFERENCES MyDept(Deptno),
 34    CONSTRAINT MyEmpSalAndComm_CHK
 35    CHECK(Sal + NVL(Comm, 0) <= 90000)
 36   );
 CONSTRAINT MyEmp_Deptno_FK
 *
ERROR at line 32:
ORA-02253: constraint specification not allowed here


SQL> ED
Wrote file afiedt.buf

  1   CREATE TABLE MyEmp
  2   (
  3    Empno NUMBER(4)
  4    CONSTRAINT MyEmp_Empno_PK PRIMARY KEY
  5    CONSTRAINT MyEmp_Empno_CHK01
  6    CHECK(Empno >= 1000 AND Empno <= 4000),
  7    Ename VARCHAR2(10)
  8    DEFAULT 'NOT GIVEN'
  9    CONSTRAINT MyEmp_Ename_NN NOT NULL
 10    CONSTRAINT MyEmp_Ename_CHK01
 11    CHECK(EName = UPPER(EName)),
 12    Job VARCHAR2(14)
 13    DEFAULT 'NOT GIVEN'
 14    CONSTRAINT MyEmp_Job_NN NOT NULL
 15    CONSTRAINT MyEmp_Job_CHK01
 16    CHECK(Job IN('PRESIDENT', 'MANAGER', 'ANALYST', 'SALESMAN', 'CLERK', 'NOT
GIVEN')),
 17    MGR NUMBER(4)
 18    CONSTRAINT MyEmp_MGR_CHK01
 19    CHECK(MGR >= 1000 AND MGR <= 4000),
 20    Sal NUMBER(7, 2)
 21    CONSTRAINT MyEmp_Sal_NN NOT NULL
 22    CONSTRAINT MyEmp_Sal_CHK01
 23    CHECK(Sal BETWEEN 1000 AND 90000),
 24    Comm NUMBER(7, 2),
 25    HireDate DATE
 26    DEFAULT SYSDATE
 27    CONSTRAINT MyEmp_HireDate_NN NOT NULL,
 28    Deptno NUMBER(2)
 29    CONSTRAINT MyEmp_Deptno_NN NOT NULL
 30    CONSTRAINT MyEmp_Deptno_FK
 31    RFERENCES MyDept(Deptno)
 32    CONSTRAINT MyEmp_Deptno_CHK
 33    CHECK(Deptno IN(10, 20, 30, 40, 50, 60, 70, 80, 90)),
 34    CONSTRAINT MyEmpSalAndComm_CHK
 35    CHECK(Sal + NVL(Comm, 0) <= 90000)
 36*  )
SQL> /
 CONSTRAINT MyEmp_Deptno_FK
 *
ERROR at line 30:
ORA-02253: constraint specification not allowed here
```

```
SQL> ED
Wrote file afiedt.buf

  1   CREATE TABLE MyEmp
  2   (
  3    Empno NUMBER(4)
  4    CONSTRAINT MyEmp_Empno_PK PRIMARY KEY
  5    CONSTRAINT MyEmp_Empno_CHK01
  6    CHECK(Empno >= 1000 AND Empno <= 4000),
  7    Ename VARCHAR2(10)
  8    DEFAULT 'NOT GIVEN'
  9    CONSTRAINT MyEmp_Ename_NN NOT NULL
 10    CONSTRAINT MyEmp_Ename_CHK01
 11    CHECK(EName = UPPER(EName)),
 12    Job VARCHAR2(14)
 13    DEFAULT 'NOT GIVEN'
 14    CONSTRAINT MyEmp_Job_NN NOT NULL
 15    CONSTRAINT MyEmp_Job_CHK01
 16    CHECK(Job IN('PRESIDENT', 'MANAGER', 'ANALYST', 'SALESMAN', 'CLERK', 'NOT
GIVEN')),
 17    MGR NUMBER(4)
 18    CONSTRAINT MyEmp_MGR_CHK01
 19    CHECK(MGR >= 1000 AND MGR <= 4000),
 20    Sal NUMBER(7, 2)
 21    CONSTRAINT MyEmp_Sal_NN NOT NULL
 22    CONSTRAINT MyEmp_Sal_CHK01
 23    CHECK(Sal BETWEEN 1000 AND 90000),
 24    Comm NUMBER(7, 2),
 25    HireDate DATE
 26    DEFAULT SYSDATE
 27    CONSTRAINT MyEmp_HireDate_NN NOT NULL,
 28    Deptno NUMBER(2)
 29    CONSTRAINT MyEmp_Deptno_NN NOT NULL
 30    CONSTRAINT MyEmp_Deptno_FK
 31    RFERENCES MyDept(Deptno),
 32    CONSTRAINT MyEmpSalAndComm_CHK
 33    CHECK(Sal + NVL(Comm, 0) <= 90000)
 34*  )
SQL> /
 CONSTRAINT MyEmp_Deptno_FK
 *
ERROR at line 30:
ORA-02253: constraint specification not allowed here


SQL> ED
Wrote file afiedt.buf

  1   CREATE TABLE MyEmp
  2   (
  3    Empno NUMBER(4)
  4    CONSTRAINT MyEmp_Empno_PK PRIMARY KEY
  5    CONSTRAINT MyEmp_Empno_CHK01
```

```
  6    CHECK(Empno >= 1000 AND Empno <= 4000),
  7    Ename VARCHAR2(10)
  8    DEFAULT 'NOT GIVEN'
  9    CONSTRAINT MyEmp_Ename_NN NOT NULL
 10    CONSTRAINT MyEmp_Ename_CHK01
 11    CHECK(EName = UPPER(EName)),
 12    Job VARCHAR2(14)
 13    DEFAULT 'NOT GIVEN'
 14    CONSTRAINT MyEmp_Job_NN NOT NULL
 15    CONSTRAINT MyEmp_Job_CHK01
 16    CHECK(Job IN('PRESIDENT', 'MANAGER', 'ANALYST', 'SALESMAN', 'CLERK', 'NOT
GIVEN')),
 17    MGR NUMBER(4)
 18    CONSTRAINT MyEmp_MGR_CHK01
 19    CHECK(MGR >= 1000 AND MGR <= 4000),
 20    Sal NUMBER(7, 2)
 21    CONSTRAINT MyEmp_Sal_NN NOT NULL
 22    CONSTRAINT MyEmp_Sal_CHK01
 23    CHECK(Sal BETWEEN 1000 AND 90000),
 24    Comm NUMBER(7, 2),
 25    HireDate DATE
 26    DEFAULT SYSDATE
 27    CONSTRAINT MyEmp_HireDate_NN NOT NULL,
 28    Deptno NUMBER(2)
 29    CONSTRAINT MyEmp_Deptno_NN NOT NULL
 30    CONSTRAINT MyEmp_Deptno_FK
 31    REFERENCES MyDept(Deptno)
 32    CONSTRAINT MyEmp_Deptno_CHK
 33    CHECK(Deptno IN(10, 20, 30, 40, 50, 60, 70, 80, 90)),
 34    CONSTRAINT MyEmpSalAndComm_CHK
 35    CHECK(Sal + NVL(Comm, 0) <= 90000)
 36* )
SQL> /

Table created.

SQL> ALTER TABLE MyEmp
  2  ADD
  3  (
  4   CONSTRAINT MyEmp_MGR_FK
  5   FOREIGN KEY(MGR)
  6   REFERENCES MyEmp(Empno)
  7   ON DELETE SET NULL
  8  );

Table altered.

SQL> cl scr

SQL> CREATE TABLE SampleALT
  2  (
  3   SampID NUMBER(2),
  4   SampName VARCHAR2(10),
  5   SampDate DATE
  6  );
```

```
Table created.

SQL> ALTER TABLE SampleALT
  2  ADD(
  3
SQL> ALTER TABLE SampleALT
  2  ADD
  3  (
  4   CONSTRAINT SampleALT_SampID_PK
  5   PRIMARY KEY(SampID),
  6   CONSTRAINT SampleALT_SampID_CHK
  7   CHECK(SampID >= 10),
  8   CONSTRAINT SampleALT_SampName_CHK
  9   CHECK(SampName = UPPER(SampName))
 10  );

Table altered.

SQL> cl scr

SQL> DESC USER_CONSTRAINTS
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 OWNER                                     NOT NULL VARCHAR2(30)
 CONSTRAINT_NAME                           NOT NULL VARCHAR2(30)
 CONSTRAINT_TYPE                                    VARCHAR2(1)
 TABLE_NAME                                NOT NULL VARCHAR2(30)
 SEARCH_CONDITION                                   LONG
 R_OWNER                                            VARCHAR2(30)
 R_CONSTRAINT_NAME                                  VARCHAR2(30)
 DELETE_RULE                                        VARCHAR2(9)
 STATUS                                             VARCHAR2(8)
 DEFERRABLE                                         VARCHAR2(14)
 DEFERRED                                           VARCHAR2(9)
 VALIDATED                                          VARCHAR2(13)
 GENERATED                                          VARCHAR2(14)
 BAD                                                VARCHAR2(3)
 RELY                                               VARCHAR2(4)
 LAST_CHANGE                                        DATE
 INDEX_OWNER                                        VARCHAR2(30)
 INDEX_NAME                                         VARCHAR2(30)
 INVALID                                            VARCHAR2(7)
 VIEW_RELATED                                       VARCHAR2(14)

SQL> COLUMN CONSTRAINT_NAME FORMAT A20
SQL> COLUMN TABLE_NAME FORMAT A15
SQL> COLUMN SEARCH_CONDITION FORMAT A25
SQL> SELECT CONSTRAINT_NAME, CONSTRAINT_TYPE, TABLE_NAME, SEARCH_CONDITION
  2  FROM USER_CONSTRAINTS
  3  WHERE TABLE_NAME = 'SAMPLEALT';

CONSTRAINT_NAME      C TABLE_NAME      SEARCH_CONDITION
-------------------- - --------------- -------------------------
SAMPLEALT_SAMPID_PK  P SAMPLEALT
```

```
SAMPLEALT_SAMPID_CHK C SAMPLEALT        SampID >= 10
SAMPLEALT_SAMPNAME_C C SAMPLEALT        SampName = UPPER(SampName
HK                                      )


SQL> DESC USER_CONS_COLUMS
ERROR:
ORA-04043: object USER_CONS_COLUMS does not exist


SQL> DESC USER_CONS_COLUMNS
 Name                                    Null?    Type
 --------------------------------------- -------- ----------------------------
 OWNER                                   NOT NULL VARCHAR2(30)
 CONSTRAINT_NAME                         NOT NULL VARCHAR2(30)
 TABLE_NAME                              NOT NULL VARCHAR2(30)
 COLUMN_NAME                                      VARCHAR2(4000)
 POSITION                                         NUMBER

SQL> DESC MYEmp
 Name                                    Null?    Type
 --------------------------------------- -------- ----------------------------
 EMPNO                                   NOT NULL NUMBER(4)
 ENAME                                   NOT NULL VARCHAR2(10)
 JOB                                     NOT NULL VARCHAR2(14)
 MGR                                              NUMBER(4)
 SAL                                     NOT NULL NUMBER(7,2)
 COMM                                             NUMBER(7,2)
 HIREDATE                                NOT NULL DATE
 DEPTNO                                  NOT NULL NUMBER(2)

SQL> SELECT CONSTRAINT_NAME, CONSTRAINT_TYPE, TABLE_NAME, SEARCH_CONDITION
  2  FROM USER_CONSTRAINTS
  3  WHERE TABLE_NAME = 'MYEMP';

CONSTRAINT_NAME      C TABLE_NAME     SEARCH_CONDITION
-------------------- - -------------- -------------------------
MYEMP_ENAME_NN       C MYEMP          "ENAME" IS NOT NULL
MYEMP_JOB_NN         C MYEMP          "JOB" IS NOT NULL
MYEMP_SAL_NN         C MYEMP          "SAL" IS NOT NULL
MYEMP_HIREDATE_NN    C MYEMP          "HIREDATE" IS NOT NULL
MYEMP_DEPTNO_NN      C MYEMP          "DEPTNO" IS NOT NULL
MYEMP_EMPNO_CHK01    C MYEMP          Empno >= 1000 AND Empno <
                                      = 4000

MYEMP_ENAME_CHK01    C MYEMP          EName = UPPER(EName)
MYEMP_JOB_CHK01      C MYEMP          Job IN('PRESIDENT', 'MANA
                                      GER', 'ANALYST', 'SALESMA

CONSTRAINT_NAME      C TABLE_NAME     SEARCH_CONDITION
-------------------- - -------------- -------------------------
                                      N', 'CLERK', 'NOT GIVEN')

MYEMP_MGR_CHK01      C MYEMP          MGR >= 1000 AND MGR <= 40
                                      00
```

```
MYEMP_SAL_CHK01        C MYEMP              Sal BETWEEN 1000 AND 9000
                                            0

MYEMP_DEPTNO_CHK       C MYEMP              Deptno IN(10, 20, 30, 40,
                                             50, 60, 70, 80, 90)


CONSTRAINT_NAME        C TABLE_NAME         SEARCH_CONDITION
-------------------- - --------------- -------------------------
MYEMPSALANDCOMM_CHK    C MYEMP              Sal + NVL(Comm, 0) <= 900
                                            00

MYEMP_EMPNO_PK         P MYEMP
MYEMP_DEPTNO_FK        R MYEMP
MYEMP_MGR_FK           R MYEMP

15 rows selected.

SQL> cl scr

SQL> DESC USER_CONSTRAINTS
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 OWNER                                     NOT NULL VARCHAR2(30)
 CONSTRAINT_NAME                           NOT NULL VARCHAR2(30)
 CONSTRAINT_TYPE                                    VARCHAR2(1)
 TABLE_NAME                                NOT NULL VARCHAR2(30)
 SEARCH_CONDITION                                   LONG
 R_OWNER                                            VARCHAR2(30)
 R_CONSTRAINT_NAME                                  VARCHAR2(30)
 DELETE_RULE                                        VARCHAR2(9)
 STATUS                                             VARCHAR2(8)
 DEFERRABLE                                         VARCHAR2(14)
 DEFERRED                                           VARCHAR2(9)
 VALIDATED                                          VARCHAR2(13)
 GENERATED                                          VARCHAR2(14)
 BAD                                                VARCHAR2(3)
 RELY                                               VARCHAR2(4)
 LAST_CHANGE                                        DATE
 INDEX_OWNER                                        VARCHAR2(30)
 INDEX_NAME                                         VARCHAR2(30)
 INVALID                                            VARCHAR2(7)
 VIEW_RELATED                                       VARCHAR2(14)

SQL> DESC USER_CONS_COLUMNS
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 OWNER                                     NOT NULL VARCHAR2(30)
 CONSTRAINT_NAME                           NOT NULL VARCHAR2(30)
 TABLE_NAME                                NOT NULL VARCHAR2(30)
 COLUMN_NAME                                        VARCHAR2(4000)
 POSITION                                           NUMBER

SQL> SPOOL OFF
```