```
SQL> SET VERIFY OFF
SQL> cl scr

SQL> SELECT SequenceName.CURRVAL
  2
SQL> SELECT SequenceName.NEXTVAL
  2
SQL> INSERT INTO TableName
  2  VALUES(SequenceName.CURRVAL,
  3
SQL> INSERT INTO TableName
  2  VALUES(SequenceName.NEXTVAL,
  3
SQL> UPDATE TableName
  2  SET
  3  ColumnName = SequenceName.CURRVAL
  4
SQL> UPDATE TableName
  2  SET
  3  ColumnName = SequenceName.NEXTVAL
  4
SQL> cl scr

SQL> SELECT
  2  SequenceName1.CURRVAL, SequenceName1.NEXTVAL
  3
SQL> cl scr

SQL> CREATE TABLE Sample01
  2  (
  3   SampID            NUMBER(4)
  4   Constraint SampID_PK01 PRIMARY  KEY,
  5   SampName    VARCHAR2(25),
  6   SampDate    DATE
  7   );

Table created.

SQL> CREATE SEQUENCE SampleSeq01
  2  INCREMENT BY 1
  3  START WITH 0
  4  MINVALUE 0
  5  MAXVALUE 5
  6  NOCACHE
  7  NOCYCLE
  8  /

Sequence created.

SQL> SELECT SampleSeq01.CURRVAL FROM DUAL;
SELECT SampleSeq01.CURRVAL FROM DUAL
       *
ERROR at line 1:
ORA-08002: sequence SAMPLESEQ01.CURRVAL is not yet defined in this session
```

```
SQL> cl scr

SQL> SELECT * FROM Sample01;

no rows selected

SQL> INSERT INTO Sample01
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4  (SampleSeq01.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> SELECT SampleSeq01.CURRVAL FROM DUAL;

   CURRVAL
----------
         0

SQL> SELECT * FROM Sample01;

    SAMPID SAMPNAME                  SAMPDATE
---------- ------------------------- ---------
         0 SAMPLE                    31-AUG-05

SQL> INSERT INTO Sample01
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4  (SampleSeq01.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> SELECT SampleSeq01.CURRVAL FROM DUAL;

   CURRVAL
----------
         1

SQL> SELECT * FROM Sample01;

    SAMPID SAMPNAME                  SAMPDATE
---------- ------------------------- ---------
         0 SAMPLE                    31-AUG-05
         1 SAMPLE                    31-AUG-05

SQL> INSERT INTO Sample01
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4  (SampleSeq01.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> R
  1  INSERT INTO Sample01
  2  (SampID, SampName,  SampDate)
  3  VALUES
```

```
   4* (SampleSeq01.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1   INSERT INTO Sample01
  2   (SampID, SampName,  SampDate)
  3   VALUES
  4* (SampleSeq01.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1   INSERT INTO Sample01
  2   (SampID, SampName,  SampDate)
  3   VALUES
  4* (SampleSeq01.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1   INSERT INTO Sample01
  2   (SampID, SampName,  SampDate)
  3   VALUES
  4* (SampleSeq01.NEXTVAL, 'SAMPLE', '31-AUG-05')
INSERT INTO Sample01
*
ERROR at line 1:
ORA-08004: sequence SAMPLESEQ01.NEXTVAL exceeds MAXVALUE and cannot be
instantiated


SQL> SELECT SampleSeq01.CURRVAL FROM DUAL;

   CURRVAL
----------
         5

SQL> cl scr

SQL> CREATE TABLE Sample02
  2  (
  3   SampID             NUMBER(4)
  4   Constraint SampID_PK02 PRIMARY  KEY,
  5   SampName    VARCHAR2(25),
  6   SampDate    DATE
  7   );

Table created.

SQL> CREATE SEQUENCE SampleSeq02
  2   INCREMENT BY 1
  3   START WITH 0
  4   MINVALUE 0
  5   MAXVALUE 5
  6   NOCACHE
```

```
    7  CYCLE
    8  /

Sequence created.

SQL> INSERT INTO Sample02
   2  (SampID, SampName,  SampDate)
   3  VALUES
   4  (SampleSeq02.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> R
   1  INSERT INTO Sample02
   2  (SampID, SampName,  SampDate)
   3  VALUES
   4* (SampleSeq02.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
   1  INSERT INTO Sample02
   2  (SampID, SampName,  SampDate)
   3  VALUES
   4* (SampleSeq02.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
   1  INSERT INTO Sample02
   2  (SampID, SampName,  SampDate)
   3  VALUES
   4* (SampleSeq02.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
   1  INSERT INTO Sample02
   2  (SampID, SampName,  SampDate)
   3  VALUES
   4* (SampleSeq02.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
   1  INSERT INTO Sample02
   2  (SampID, SampName,  SampDate)
   3  VALUES
   4* (SampleSeq02.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> SELECT SampleSeq02.CURRVAL FROM DUAL;

   CURRVAL
----------
```

```
         5

SQL> SELECT * FROM Sample02;

    SAMPID SAMPNAME                  SAMPDATE
---------- ------------------------- ---------
         0 SAMPLE                    31-AUG-05
         1 SAMPLE                    31-AUG-05
         2 SAMPLE                    31-AUG-05
         3 SAMPLE                    31-AUG-05
         4 SAMPLE                    31-AUG-05
         5 SAMPLE                    31-AUG-05

6 rows selected.

SQL> INSERT INTO Sample02
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4  (SampleSeq02.NEXTVAL, 'SAMPLE', '31-AUG-05');
INSERT INTO Sample02
*
ERROR at line 1:
ORA-00001: unique constraint (SCOTT.SAMPID_PK02) violated


SQL> SELECT SampleSeq02.CURRVAL FROM DUAL;

   CURRVAL
----------
         0

SQL> cl scr

SQL> CREATE TABLE Sample03
  2  (
  3   SampID          NUMBER(4)
  4   SampName    VARCHAR2(25),
  5   SampDate    DATE
  6  );
(
*
ERROR at line 2:
ORA-00922: missing or invalid option


SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE Sample03
  2  (
  3   SampID          NUMBER(4),
  4   SampName    VARCHAR2(25),
  5   SampDate    DATE
  6* )
SQL> /
```

```
Table created.

SQL> cl scr

SQL> CREATE SEQUENCE SampleSeq03
  2  INCREMENT BY 1
  3  START WITH 10
  4  MINVALUE 0
  5  MAXVALUE 20
  6  NOCACHE
  7  CYCLE
  8  /

Sequence created.

SQL> INSERT INTO Sample03
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4  (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> SELECT SampleSeq03.CURRVAL FROM DUAL;

   CURRVAL
----------
        10

SQL> INSERT INTO Sample03
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4  (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> R
  1  INSERT INTO Sample03
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1  INSERT INTO Sample03
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1  INSERT INTO Sample03
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05')
```

```
1 row created.

SQL> R
  1   INSERT INTO Sample03
  2   (SampID, SampName,  SampDate)
  3   VALUES
  4* (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1   INSERT INTO Sample03
  2   (SampID, SampName,  SampDate)
  3   VALUES
  4* (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1   INSERT INTO Sample03
  2   (SampID, SampName,  SampDate)
  3   VALUES
  4* (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1   INSERT INTO Sample03
  2   (SampID, SampName,  SampDate)
  3   VALUES
  4* (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1   INSERT INTO Sample03
  2   (SampID, SampName,  SampDate)
  3   VALUES
  4* (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1   INSERT INTO Sample03
  2   (SampID, SampName,  SampDate)
  3   VALUES
  4* (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> SELECT * FROM Sample03;

    SAMPID SAMPNAME                 SAMPDATE
---------- ------------------------ ---------
        10 SAMPLE                   31-AUG-05
```

```
         11 SAMPLE                     31-AUG-05
         12 SAMPLE                     31-AUG-05
         13 SAMPLE                     31-AUG-05
         14 SAMPLE                     31-AUG-05
         15 SAMPLE                     31-AUG-05
         16 SAMPLE                     31-AUG-05
         17 SAMPLE                     31-AUG-05
         18 SAMPLE                     31-AUG-05
         19 SAMPLE                     31-AUG-05
         20 SAMPLE                     31-AUG-05

11 rows selected.

SQL> INSERT INTO Sample03
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4  (SampleSeq03.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> /

1 row created.

SQL> /

1 row created.

SQL> SELECT SampleSeq03.CURRVAL FROM DUAL;

   CURRVAL
----------
         2

SQL>  SELECT * FROM Sample03;

    SAMPID SAMPNAME                   SAMPDATE
---------- ------------------------- ---------
        10 SAMPLE                     31-AUG-05
        11 SAMPLE                     31-AUG-05
        12 SAMPLE                     31-AUG-05
        13 SAMPLE                     31-AUG-05
        14 SAMPLE                     31-AUG-05
        15 SAMPLE                     31-AUG-05
        16 SAMPLE                     31-AUG-05
        17 SAMPLE                     31-AUG-05
        18 SAMPLE                     31-AUG-05
        19 SAMPLE                     31-AUG-05
        20 SAMPLE                     31-AUG-05

    SAMPID SAMPNAME                   SAMPDATE
---------- ------------------------- ---------
         0 SAMPLE                     31-AUG-05
         1 SAMPLE                     31-AUG-05
         2 SAMPLE                     31-AUG-05
```

```
14 rows selected.

SQL> cl scr

SQL> CREATE TABLE Sample04
  2  (
  3   SampID              NUMBER(4)
  4   SampName     VARCHAR2(25),
  5   SampDate     DATE
  6   );
(
*
ERROR at line 2:
ORA-00922: missing or invalid option


SQL> ED
Wrote file afiedt.buf

  1  CREATE TABLE Sample04
  2  (
  3   SampID              NUMBER(4),
  4   SampName     VARCHAR2(25),
  5   SampDate     DATE
  6*  )
SQL> /

Table created.

SQL> cl scr

SQL> CREATE SEQUENCE SampleSeq04
  2  INCREMENT BY 10
  3  START WITH 0
  4  MINVALUE 0
  5  MAXVALUE 100
  6  NOCACHE
  7  NOCYCLE
  8  /

Sequence created.

SQL> INSERT INTO Sample04
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4  (SampleSeq04.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> R
  1  INSERT INTO Sample04
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq04.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.
```

```
SQL> R
  1  INSERT INTO Sample04
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq04.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1  INSERT INTO Sample04
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq04.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> SELECT * FROM Sample04;

    SAMPID SAMPNAME                   SAMPDATE
---------- ------------------------- ---------
         0 SAMPLE                     31-AUG-05
        10 SAMPLE                     31-AUG-05
        20 SAMPLE                     31-AUG-05
        30 SAMPLE                     31-AUG-05

SQL> cl scr

SQL> CREATE TABLE Sample05
  2  (
  3   SampID          NUMBER(4),
  4   SampName    VARCHAR2(25),
  5   SampDate    DATE
  6   );

Table created.

SQL> CREATE SEQUENCE SampleSeq05
  2  INCREMENT BY -1
  3  START WITH 10
  4  MINVALUE 0
  5  MAXVALUE 10
  6  NOCACHE
  7  NOCYCLE
  8  /

Sequence created.

SQL> INSERT INTO Sample05
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4  (SampleSeq05.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> R
```

```
   1   INSERT INTO Sample05
   2   (SampID, SampName,  SampDate)
   3   VALUES
   4*  (SampleSeq05.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
   1   INSERT INTO Sample05
   2   (SampID, SampName,  SampDate)
   3   VALUES
   4*  (SampleSeq05.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> SELECT * FROM Sample05;

    SAMPID SAMPNAME                   SAMPDATE
---------- ------------------------- ---------
        10 SAMPLE                     31-AUG-05
         9 SAMPLE                     31-AUG-05
         8 SAMPLE                     31-AUG-05

SQL> cl scr

SQL> CREATE TABLE Sample06
   2   (
   3    SampID            NUMBER(4),
   4    SampName     VARCHAR2(25),
   5    SampDate     DATE
   6    );

Table created.

SQL> CREATE SEQUENCE SampleSeq06
   2   INCREMENT BY 1
   3   START WITH 0
   4   MINVALUE 0
   5   MAXVALUE 20
   6   NOCACHE
   7   NOCYCLE
   8   /

Sequence created.

SQL> INSERT INTO Sample06
   2   (SampID, SampName,  SampDate)
   3   VALUES
   4   (SampleSeq06.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> R
   1   INSERT INTO Sample06
   2   (SampID, SampName,  SampDate)
   3   VALUES
```

```
   4* (SampleSeq06.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1  INSERT INTO Sample06
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq06.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> SELECT SampleSeq06.NEXTVAL FROM DUAL;

    NEXTVAL
----------
         3

SQL> R
  1* SELECT SampleSeq06.NEXTVAL FROM DUAL

    NEXTVAL
----------
         4

SQL> R
  1* SELECT SampleSeq06.NEXTVAL FROM DUAL

    NEXTVAL
----------
         5

SQL> INSERT INTO Sample06
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4  (SampleSeq06.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> R
  1  INSERT INTO Sample06
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq06.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1  INSERT INTO Sample06
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq06.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> SELECT * FROM Sample06;
```

```
       SAMPID SAMPNAME                   SAMPDATE
   ---------- ------------------------- ---------
            0 SAMPLE                     31-AUG-05
            1 SAMPLE                     31-AUG-05
            2 SAMPLE                     31-AUG-05
            6 SAMPLE                     31-AUG-05
            7 SAMPLE                     31-AUG-05
            8 SAMPLE                     31-AUG-05

6 rows selected.

SQL> CREATE TABLE Sample07_1
  2  (
  3   SampID              NUMBER(4),
  4   SampName     VARCHAR2(25),
  5   SampDate     DATE
  6   );

Table created.

SQL> ED
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  1   CREATE TABLE Sample07_2
  2   (
  3    SampID              NUMBER(4),
  4    SampName     VARCHAR2(25),
  5    SampDate     DATE
  6*  )
SQL> /

Table created.

SQL> ED
Wrote file afiedt.buf

  1   CREATE TABLE Sample07_3
  2   (
  3    SampID              NUMBER(4),
  4    SampName     VARCHAR2(25),
  5    SampDate     DATE
  6*  )
SQL> /

Table created.

SQL> CREATE SEQUENCE SampleSeq07
  2   INCREMENT BY 1
  3   START WITH 0
  4   MINVALUE 0
  5   MAXVALUE 20
  6   NOCACHE
  7   NOCYCLE
  8   /
```

```
Sequence created.

SQL> INSERT INTO Sample07_1
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4  (SampleSeq07.NEXTVAL, 'SAMPLE', '31-AUG-05');

1 row created.

SQL> R
  1  INSERT INTO Sample07_1
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq07.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1  INSERT INTO Sample07_1
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq07.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> ED
Wrote file afiedt.buf

  1  INSERT INTO Sample07_2
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq07.NEXTVAL, 'SAMPLE', '31-AUG-05')
SQL> /

1 row created.

SQL> R
  1  INSERT INTO Sample07_2
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq07.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
  1  INSERT INTO Sample07_2
  2  (SampID, SampName,  SampDate)
  3  VALUES
  4* (SampleSeq07.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> ED
Wrote file afiedt.buf

  1  INSERT INTO Sample07_3
```

```
    2  (SampID, SampName,  SampDate)
    3  VALUES
    4* (SampleSeq07.NEXTVAL, 'SAMPLE', '31-AUG-05')
SQL> /

1 row created.

SQL> R
    1  INSERT INTO Sample07_3
    2  (SampID, SampName,  SampDate)
    3  VALUES
    4* (SampleSeq07.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> R
    1  INSERT INTO Sample07_3
    2  (SampID, SampName,  SampDate)
    3  VALUES
    4* (SampleSeq07.NEXTVAL, 'SAMPLE', '31-AUG-05')

1 row created.

SQL> SELECT * FROM Sample07_1;

    SAMPID SAMPNAME                 SAMPDATE
---------- ------------------------ ---------
         0 SAMPLE                   31-AUG-05
         1 SAMPLE                   31-AUG-05
         2 SAMPLE                   31-AUG-05

SQL> SELECT * FROM Sample07_2;

    SAMPID SAMPNAME                 SAMPDATE
---------- ------------------------ ---------
         3 SAMPLE                   31-AUG-05
         4 SAMPLE                   31-AUG-05
         5 SAMPLE                   31-AUG-05

SQL> SELECT * FROM Sample07_3;

    SAMPID SAMPNAME                 SAMPDATE
---------- ------------------------ ---------
         6 SAMPLE                   31-AUG-05
         7 SAMPLE                   31-AUG-05
         8 SAMPLE                   31-AUG-05

SQL> SPOOL OFF
SQL> cl scr

SQL> DESC USER_OBJECTS
 Name                                     Null?    Type
 ---------------------------------------- -------- ----------------------------
 OBJECT_NAME                                       VARCHAR2(128)
 SUBOBJECT_NAME                                    VARCHAR2(30)
 OBJECT_ID                                         NUMBER
```

```
   DATA_OBJECT_ID                              NUMBER
   OBJECT_TYPE                                 VARCHAR2(19)
   CREATED                                     DATE
   LAST_DDL_TIME                               DATE
   TIMESTAMP                                   VARCHAR2(19)
   STATUS                                      VARCHAR2(7)
   TEMPORARY                                   VARCHAR2(1)
   GENERATED                                   VARCHAR2(1)
   SECONDARY                                   VARCHAR2(1)

SQL> COLUMN OBJECT_NAME FORMAT A25
SQL> COLUMN OBJECT_TYPE FORMAT A20
SQL> SELECT OBJECT_NAME, OBJECT_TYPE
  2  FROM USER_OBJECTS
  3  ORDER BY OBJECT_TYPE;

OBJECT_NAME               OBJECT_TYPE
------------------------- --------------------
SAMPID_PK01               INDEX
SAMPID_PK02               INDEX
EMP_PRIMARY_KEY           INDEX
DEPT_PRIMARY_KEY          INDEX
ORD_PRIMARY_KEY           INDEX
PRODUCT_PRIMARY_KEY       INDEX
PRICE_INDEX               INDEX
ITEM_PRIMARY_KEY          INDEX
CUSTOMER_PRIMARY_KEY      INDEX
ORDID                     SEQUENCE
PRODID                    SEQUENCE

OBJECT_NAME               OBJECT_TYPE
------------------------- --------------------
SAMPLESEQ03               SEQUENCE
SAMPLESEQ05               SEQUENCE
SAMPLESEQ07               SEQUENCE
SAMPLESEQ06               SEQUENCE
SAMPLESEQ04               SEQUENCE
SAMPLESEQ02               SEQUENCE
SAMPLESEQ01               SEQUENCE
CUSTID                    SEQUENCE
SAMPLE                    TABLE
PRICE                     TABLE
PRODUCT                   TABLE

OBJECT_NAME               OBJECT_TYPE
------------------------- --------------------
BONUS                     TABLE
EMP                       TABLE
DEPT                      TABLE
SAMPLE07_3                TABLE
SAMPLE07_2                TABLE
SAMPLE07_1                TABLE
SAMPLE06                  TABLE
SAMPLE05                  TABLE
SAMPLE04                  TABLE
ITEM                      TABLE
```

```
ORD                      TABLE

OBJECT_NAME              OBJECT_TYPE
-----------------------  --------------------
CUSTOMER                 TABLE
DUMMY                    TABLE
SALGRADE                 TABLE
SAMPLE03                 TABLE
SAMPLE02                 TABLE
STUDENTS                 TABLE
SAMPLETAB                TABLE
SAMPLESP                 TABLE
SAMPLEINS                TABLE
SAMPLE01                 TABLE
SALES                    VIEW

44 rows selected.

SQL> cl scr

SQL> DESC USER_SEQUENCES
 Name                                        Null?     Type
 ------------------------------------------- --------  -----------------------------
 SEQUENCE_NAME                               NOT NULL  VARCHAR2(30)
 MIN_VALUE                                             NUMBER
 MAX_VALUE                                             NUMBER
 INCREMENT_BY                                NOT NULL  NUMBER
 CYCLE_FLAG                                            VARCHAR2(1)
 ORDER_FLAG                                            VARCHAR2(1)
 CACHE_SIZE                                  NOT NULL  NUMBER
 LAST_NUMBER                                 NOT NULL  NUMBER

SQL> COLUMN SEQUENCE_NAME FORMAT A15
SQL> COLUMN MIN_VALUE FORMAT 99
SQL> COLUMN MAX_VALUE FORMAT 999
SQL> COLUMN INCREMENT_BY FORMAT 999
SQL> COLUMN LAST_NUMBER FORMAT 99
SQL> SELECT SEQUENCE_NAME, MIN_VALUE, MAX_VALUE, INCREMENT_BY, LAST_NUMBER
  2  FROM USER_SEQUENCES
  3  WHERE SEQUENCE_NAME = 'SAMPLESEQ0'||'&GVal';
Enter value for gval: 1


SEQUENCE_NAME    MIN_VALUE MAX_VALUE INCREMENT_BY LAST_NUMBER
--------------- --------- --------- ------------ -----------
SAMPLESEQ01             0         5            1           6

SQL> SELECT SAMPLESEQ01.CURRVAL FROM DUAL;
SELECT SAMPLESEQ01.CURRVAL FROM DUAL
       *
ERROR at line 1:
ORA-08002: sequence SAMPLESEQ01.CURRVAL is not yet defined in this session


SQL> SELECT SAMPLESEQ01.NEXTVAL FROM DUAL;
SELECT SAMPLESEQ01.NEXTVAL FROM DUAL
        *
```

```
ERROR at line 1:
ORA-08004: sequence SAMPLESEQ01.NEXTVAL exceeds MAXVALUE and cannot be
instantiated


SQL> SELECT SAMPLESEQ01.CURRVAL FROM DUAL;
SELECT SAMPLESEQ01.CURRVAL FROM DUAL
                                   *
ERROR at line 1:
ORA-08002: sequence SAMPLESEQ01.CURRVAL is not yet defined in this session


SQL> cl scr

SQL> SELECT Ename, Sal, Deptno, Job
  2  FROM Emp
  3  START WITH Ename = 'KING'
  4  CONNECT BY PRIOR Empno = MGR;

ENAME             SAL     DEPTNO JOB
---------- ---------- ---------- ---------
KING             5000         10 PRESIDENT
BLAKE            2850         30 MANAGER
MARTIN           1250         30 SALESMAN
ALLEN            1600         30 SALESMAN
TURNER           1500         30 SALESMAN
JAMES             950         30 CLERK
WARD             1250         30 SALESMAN
CLARK            2450         10 MANAGER
MILLER           1300         10 CLERK
JONES            2975         20 MANAGER
FORD             3000         20 ANALYST

ENAME             SAL     DEPTNO JOB
---------- ---------- ---------- ---------
SMITH             800         20 CLERK
SCOTT            3000         20 ANALYST
ADAMS            1100         20 CLERK

14 rows selected.

SQL> ED
Wrote file afiedt.buf

  1  SELECT LEVEL, Ename, Sal, Deptno, Job
  2  FROM Emp
  3  START WITH Ename = 'KING'
  4* CONNECT BY PRIOR Empno = MGR
SQL> /

     LEVEL ENAME             SAL     DEPTNO JOB
---------- ---------- ---------- ---------- ---------
         1 KING             5000         10 PRESIDENT
         2 BLAKE            2850         30 MANAGER
         3 MARTIN           1250         30 SALESMAN
         3 ALLEN            1600         30 SALESMAN
```

```
        3 TURNER              1500         30 SALESMAN
        3 JAMES                950         30 CLERK
        3 WARD                1250         30 SALESMAN
        2 CLARK               2450         10 MANAGER
        3 MILLER              1300         10 CLERK
        2 JONES               2975         20 MANAGER
        3 FORD                3000         20 ANALYST

    LEVEL ENAME                SAL     DEPTNO JOB
---------- ---------- ---------- ---------- ---------
        4 SMITH                800         20 CLERK
        3 SCOTT               3000         20 ANALYST
        4 ADAMS               1100         20 CLERK

14 rows selected.

SQL> ED
Wrote file afiedt.buf

  1   SELECT LEVEL, Ename, Sal, Deptno, Job
  2*  FROM Emp
  3   /
FROM Emp
      *
ERROR at line 2:
ORA-01788: CONNECT BY clause required in this query block


SQL> cl scr

SQL> COLUMN Org_Level FORMAT A15
SQL> SELECT
  2   LPAD(LEVEL, ((2 * LEVEL) - 1)) Org_Level,
  3   Ename, Empno, Mgr, Job
  4   FROM Emp
  5   START WITH Job = 'PRESIDENT'
  6   CONNECT BY PRIOR Empno = MGR;

ORG_LEVEL        ENAME          EMPNO        MGR JOB
---------------- ---------- ---------- ---------- ---------
1                KING            7839            PRESIDENT
  2              BLAKE           7698       7839 MANAGER
    3            MARTIN          7654       7698 SALESMAN
    3            ALLEN           7499       7698 SALESMAN
    3            TURNER          7844       7698 SALESMAN
    3            JAMES           7900       7698 CLERK
    3            WARD            7521       7698 SALESMAN
  2              CLARK           7782       7839 MANAGER
    3            MILLER          7934       7782 CLERK
  2              JONES           7566       7839 MANAGER
    3            FORD            7902       7566 ANALYST

ORG_LEVEL        ENAME          EMPNO        MGR JOB
---------------- ---------- ---------- ---------- ---------
      4          SMITH           7369       7902 CLERK
    3            SCOTT           7788       7566 ANALYST
```

```
        4          ADAMS          7876        7788 CLERK

14 rows selected.

SQL> ED
Wrote file afiedt.buf

  1  SELECT
  2  LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename  Org_Level, Empno, Mgr, Job
  3  FROM Emp
  4  START WITH Job = 'PRESIDENT'
  5* CONNECT BY PRIOR Empno = MGR
SQL> ED
Wrote file afiedt.buf

  1  SELECT
  2  LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename  Org_Level, Empno, Mgr, Job
  3  FROM Emp
  4  START WITH Job = 'PRESIDENT'
  5* CONNECT BY PRIOR Empno = MGR
SQL> /

ORG_LEVEL            EMPNO        MGR JOB
---------------  ----------  ---------- ---------
1 KING               7839            PRESIDENT
  2 BLAKE            7698        7839 MANAGER
    3 MARTIN         7654        7698 SALESMAN
    3 ALLEN          7499        7698 SALESMAN
    3 TURNER         7844        7698 SALESMAN
    3 JAMES          7900        7698 CLERK
    3 WARD           7521        7698 SALESMAN
  2 CLARK            7782        7839 MANAGER
    3 MILLER         7934        7782 CLERK
  2 JONES            7566        7839 MANAGER
    3 FORD           7902        7566 ANALYST

ORG_LEVEL            EMPNO        MGR JOB
---------------  ----------  ---------- ---------
      4 SMITH        7369        7902 CLERK
    3 SCOTT          7788        7566 ANALYST
      4 ADAMS        7876        7788 CLERK

14 rows selected.

SQL> ED
Wrote file afiedt.buf

  1  SELECT
  2  LPAD(' ', ((2 * LEVEL) - 1))||Ename  Org_Level, Empno, Mgr, Job
  3  FROM Emp
  4  START WITH Job = 'PRESIDENT'
  5* CONNECT BY PRIOR Empno = MGR
SQL> /

ORG_LEVEL            EMPNO        MGR JOB
---------------  ----------  ---------- ---------
```

```
  KING                7839                PRESIDENT
    BLAKE             7698           7839 MANAGER
      MARTIN          7654           7698 SALESMAN
      ALLEN           7499           7698 SALESMAN
      TURNER          7844           7698 SALESMAN
      JAMES           7900           7698 CLERK
      WARD            7521           7698 SALESMAN
    CLARK             7782           7839 MANAGER
      MILLER          7934           7782 CLERK
    JONES             7566           7839 MANAGER
      FORD            7902           7566 ANALYST

ORG_LEVEL              EMPNO         MGR JOB
--------------- ---------- ---------- ---------
        SMITH           7369         7902 CLERK
      SCOTT             7788         7566 ANALYST
        ADAMS           7876         7788 CLERK

14 rows selected.

SQL> cl scr

SQL> SELECT
  2  LPAD(' ', ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, MGR, Job , Sal
  4  FROM Emp
  5  WHERE Job != 'ANALYST'
  6  START WITH Job = 'PRESIDENT'
  7  CONNECT BY PRIOR Empno = MGR;

ORG_CHART
--------------------------------------------------------------------------------
     EMPNO        MGR JOB             SAL
---------- ---------- --------- ----------
  KING
      7839            PRESIDENT       5000

    BLAKE
      7698       7839 MANAGER         2850

      MARTIN
      7654       7698 SALESMAN        1250


ORG_CHART
--------------------------------------------------------------------------------
     EMPNO        MGR JOB             SAL
---------- ---------- --------- ----------
    ALLEN
      7499       7698 SALESMAN        1600

    TURNER
      7844       7698 SALESMAN        1500

    JAMES
      7900       7698 CLERK            950
```

```
ORG_CHART
--------------------------------------------------------------------------------
     EMPNO        MGR JOB            SAL
---------- ---------- --------- ----------
     WARD
     7521       7698 SALESMAN        1250

     CLARK
     7782       7839 MANAGER         2450

     MILLER
     7934       7782 CLERK           1300


ORG_CHART
--------------------------------------------------------------------------------
     EMPNO        MGR JOB            SAL
---------- ---------- --------- ----------
     JONES
     7566       7839 MANAGER         2975

       SMITH
     7369       7902 CLERK            800

       ADAMS
     7876       7788 CLERK           1100


12 rows selected.

SQL> COLUMN Org_Chart FORMAT A20
SQL> /

ORG_CHART                 EMPNO        MGR JOB            SAL
-------------------- ---------- ---------- --------- ----------
  KING                     7839            PRESIDENT       5000
   BLAKE                   7698       7839 MANAGER         2850
     MARTIN                7654       7698 SALESMAN        1250
     ALLEN                 7499       7698 SALESMAN        1600
     TURNER                7844       7698 SALESMAN        1500
     JAMES                 7900       7698 CLERK            950
     WARD                  7521       7698 SALESMAN        1250
   CLARK                   7782       7839 MANAGER         2450
     MILLER                7934       7782 CLERK           1300
   JONES                   7566       7839 MANAGER         2975
     SMITH                 7369       7902 CLERK            800

ORG_CHART                 EMPNO        MGR JOB            SAL
-------------------- ---------- ---------- --------- ----------
     ADAMS                 7876       7788 CLERK           1100


12 rows selected.

SQL> ED
```

```
Wrote file afiedt.buf

  1   SELECT
  2   LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3   Empno, MGR, Job , Sal
  4   FROM Emp
  5   WHERE Job != 'ANALYST'
  6   START WITH Job = 'PRESIDENT'
  7*  CONNECT BY PRIOR Empno = MGR
SQL> /

ORG_CHART                EMPNO       MGR JOB           SAL
-------------------- ---------- ---------- --------- ----------
1 KING                  7839              PRESIDENT      5000
  2 BLAKE                7698      7839 MANAGER        2850
    3 MARTIN             7654      7698 SALESMAN       1250
    3 ALLEN              7499      7698 SALESMAN       1600
    3 TURNER             7844      7698 SALESMAN       1500
    3 JAMES              7900      7698 CLERK           950
    3 WARD               7521      7698 SALESMAN       1250
  2 CLARK                7782      7839 MANAGER        2450
    3 MILLER             7934      7782 CLERK          1300
  2 JONES                7566      7839 MANAGER        2975
      4 SMITH            7369      7902 CLERK           800

ORG_CHART                EMPNO       MGR JOB           SAL
-------------------- ---------- ---------- --------- ----------
      4 ADAMS            7876      7788 CLERK          1100

12 rows selected.

SQL> cl scr

SQL> ED
Wrote file afiedt.buf

  1   SELECT
  2   LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3   Empno, MGR, Job , Sal
  4   FROM Emp
  5   START WITH Ename = 'BLAKE'
  6*  CONNECT BY PRIOR Empno = MGR
SQL> /

ORG_CHART                EMPNO       MGR JOB           SAL
-------------------- ---------- ---------- --------- ----------
1 BLAKE                 7698      7839 MANAGER        2850
  2 MARTIN               7654      7698 SALESMAN       1250
  2 ALLEN                7499      7698 SALESMAN       1600
  2 TURNER               7844      7698 SALESMAN       1500
  2 JAMES                7900      7698 CLERK           950
  2 WARD                 7521      7698 SALESMAN       1250

6 rows selected.

SQL> ED
```

```
Wrote file afiedt.buf

  1   SELECT
  2   LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3   Empno, MGR, Job , Sal
  4   FROM Emp
  5   START WITH Ename = 'JONES'
  6* CONNECT BY PRIOR Empno = MGR
SQL> /

ORG_CHART                 EMPNO       MGR JOB              SAL
-------------------- ---------- ---------- --------- ----------
1 JONES                  7566      7839 MANAGER        2975
  2 FORD                 7902      7566 ANALYST        3000
    3 SMITH              7369      7902 CLERK           800
  2 SCOTT                7788      7566 ANALYST        3000
    3 ADAMS              7876      7788 CLERK          1100

SQL> cl scr

SQL> SELECT
  2   LPAD(' ', ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3   Empno, MGR, Job, Sal
  4   FROM Emp
  5   START WITH Job = 'PRESIDENT'
  6   CONNECT BY PRIOR Empno = MGR
  7   AND LEVEL <= 2;

ORG_CHART                 EMPNO       MGR JOB              SAL
-------------------- ---------- ---------- --------- ----------
  KING                   7839           PRESIDENT      5000
    BLAKE                7698      7839 MANAGER        2850
    CLARK                7782      7839 MANAGER        2450
    JONES                7566      7839 MANAGER        2975

SQL> ED
Wrote file afiedt.buf

  1   SELECT
  2   LPAD(' ', ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3   Empno, MGR, Job, Sal
  4   FROM Emp
  5   WHERE LEVEL <= 2
  6   START WITH Job = 'PRESIDENT'
  7* CONNECT BY PRIOR Empno = MGR
  8   /

ORG_CHART                 EMPNO       MGR JOB              SAL
-------------------- ---------- ---------- --------- ----------
  KING                   7839           PRESIDENT      5000
    BLAKE                7698      7839 MANAGER        2850
    CLARK                7782      7839 MANAGER        2450
    JONES                7566      7839 MANAGER        2975

SQL> ED
Wrote file afiedt.buf
```

```
  1  SELECT
  2  LPAD(' ', ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, MGR, Job, Sal
  4  FROM Emp
  5  WHERE LEVEL = 2
  6  START WITH Job = 'PRESIDENT'
  7* CONNECT BY PRIOR Empno = MGR
SQL> /

ORG_CHART                 EMPNO        MGR JOB             SAL
-------------------- ---------- ---------- --------- ----------
    BLAKE                  7698       7839 MANAGER        2850
    CLARK                  7782       7839 MANAGER        2450
    JONES                  7566       7839 MANAGER        2975

SQL> ED
Wrote file afiedt.buf

  1  SELECT
  2  LPAD(' ', ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, MGR, Job, Sal
  4  FROM Emp
  5  START WITH Job = 'PRESIDENT'
  6  CONNECT BY PRIOR Empno = MGR
  7* LEVEL = 2
SQL> /
LEVEL = 2
*
ERROR at line 7:
ORA-00933: SQL command not properly ended


SQL> ED
Wrote file afiedt.buf

  1  SELECT
  2  LPAD(' ', ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, MGR, Job, Sal
  4  FROM Emp
  5  START WITH Job = 'PRESIDENT'
  6  CONNECT BY PRIOR Empno = MGR AND
  7* LEVEL = 2
SQL> /

ORG_CHART                 EMPNO        MGR JOB             SAL
-------------------- ---------- ---------- --------- ----------
  KING                   7839            PRESIDENT      5000
    BLAKE                7698       7839 MANAGER        2850
    CLARK                7782       7839 MANAGER        2450
    JONES                7566       7839 MANAGER        2975

SQL> ED
Wrote file afiedt.buf

  1  SELECT
```

```
  2  LPAD(' ', ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, MGR, Job, Sal
  4  FROM Emp
  5  START WITH Job = 'PRESIDENT'
  6  CONNECT BY PRIOR Empno = MGR AND
  7* LEVEL = 2
SQL> SPOOL OFF
SQL> cl scr

SQL> COLUMN Org_Chart FORMAT A20
SQL> cl scr

SQL> SELECT
  2  LPAD(' ', ((2 * LEVEL) - 1))||Ename Org_Chart,
  3  Empno, MGR, Job, Sal
  4  FROM Emp
  5  START WITH Job = 'PRESIDENT'
  6  CONNECT BY NOCYCLE PRIOR  Empno = MGR
  7  AND LEVEL = 2;

ORG_CHART               EMPNO        MGR JOB             SAL
-------------------- ---------- ---------- --------- ----------
 KING                    7839            PRESIDENT      5000
   BLAKE                 7698       7839 MANAGER        2850
   CLARK                 7782       7839 MANAGER        2450
   JONES                 7566       7839 MANAGER        2975

SQL> cl scr

SQL> SELECT
  2  LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, MGR, Job, Sal
  4  FROM Emp
  5  START WITH Job = 'PRESIDENT'
  6  CONNECT BY NOCYCLE PRIOR  Empno = MGR
  7  AND LEVEL IN(2, 4);

ORG_CHART               EMPNO        MGR JOB             SAL
-------------------- ---------- ---------- --------- ----------
1 KING                   7839            PRESIDENT      5000
  2 BLAKE                7698       7839 MANAGER        2850
  2 CLARK                7782       7839 MANAGER        2450
  2 JONES                7566       7839 MANAGER        2975

SQL> ED
Wrote file afiedt.buf

  1  SELECT
  2  LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, MGR, Job, Sal
  4  FROM Emp
  5  START WITH Job = 'PRESIDENT'
  6  CONNECT BY NOCYCLE PRIOR  Empno = MGR
  7* AND LEVEL IN(2, 3, 4)
SQL> /
```

```
ORG_CHART                 EMPNO        MGR JOB             SAL
-------------------- ---------- ---------- --------- ----------
1 KING                      7839            PRESIDENT        5000
  2 BLAKE                   7698       7839 MANAGER          2850
    3 MARTIN                7654       7698 SALESMAN         1250
    3 ALLEN                 7499       7698 SALESMAN         1600
    3 TURNER                7844       7698 SALESMAN         1500
    3 JAMES                 7900       7698 CLERK             950
    3 WARD                  7521       7698 SALESMAN         1250
  2 CLARK                   7782       7839 MANAGER          2450
    3 MILLER                7934       7782 CLERK            1300
  2 JONES                   7566       7839 MANAGER          2975
    3 FORD                  7902       7566 ANALYST          3000

ORG_CHART                 EMPNO        MGR JOB             SAL
-------------------- ---------- ---------- --------- ----------
      4 SMITH              7369       7902 CLERK             800
    3 SCOTT                7788       7566 ANALYST          3000
      4 ADAMS              7876       7788 CLERK            1100

14 rows selected.

SQL> ED
Wrote file afiedt.buf

  1   SELECT
  2   LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3   Empno, MGR, Job, Sal
  4   FROM Emp
  5   WHERE LEVEL IN(2, 4)
  6   START WITH Job = 'PRESIDENT'
  7*  CONNECT BY NOCYCLE PRIOR  Empno = MGR
  8   /

ORG_CHART                 EMPNO        MGR JOB             SAL
-------------------- ---------- ---------- --------- ----------
  2 BLAKE                   7698       7839 MANAGER          2850
  2 CLARK                   7782       7839 MANAGER          2450
  2 JONES                   7566       7839 MANAGER          2975
      4 SMITH              7369       7902 CLERK             800
      4 ADAMS              7876       7788 CLERK            1100

SQL> ED
Wrote file afiedt.buf

  1   SELECT
  2   LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3   Empno, MGR, Job, Sal
  4   FROM Emp
  5   WHERE LEVEL NOT IN(2, 4)
  6   START WITH Job = 'PRESIDENT'
  7*  CONNECT BY NOCYCLE PRIOR  Empno = MGR
SQL> /

ORG_CHART                 EMPNO        MGR JOB             SAL
-------------------- ---------- ---------- --------- ----------
```

```
1 KING                      7839                 PRESIDENT      5000
     3 MARTIN               7654       7698 SALESMAN            1250
     3 ALLEN                7499       7698 SALESMAN            1600
     3 TURNER               7844       7698 SALESMAN            1500
     3 JAMES                7900       7698 CLERK                950
     3 WARD                 7521       7698 SALESMAN            1250
     3 MILLER               7934       7782 CLERK               1300
     3 FORD                 7902       7566 ANALYST             3000
     3 SCOTT                7788       7566 ANALYST             3000

9 rows selected.

SQL> cl scr

SQL> SELECT
  2  LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, MGR, Job, Sal
  4  FROM Emp
  5  WHERE MOD(LEVEL, 2) = 0
  6  START WITH Job = 'PRESIDENT'
  7  CONNECT BY NOCYCLE PRIOR Empno = MGR;

ORG_CHART                 EMPNO        MGR JOB              SAL
--------------------  ----------  ---------- --------- ----------
  2 BLAKE                 7698       7839 MANAGER            2850
  2 CLARK                 7782       7839 MANAGER            2450
  2 JONES                 7566       7839 MANAGER            2975
     4 SMITH              7369       7902 CLERK                800
     4 ADAMS              7876       7788 CLERK               1100

SQL> ED
Wrote file afiedt.buf

  1  SELECT
  2  LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, MGR, Job, Sal
  4  FROM Emp
  5  WHERE MOD(LEVEL, 2) = 1
  6  START WITH Job = 'PRESIDENT'
  7* CONNECT BY NOCYCLE PRIOR Empno = MGR
SQL> /

ORG_CHART                 EMPNO        MGR JOB              SAL
--------------------  ----------  ---------- --------- ----------
1 KING                      7839                 PRESIDENT      5000
     3 MARTIN               7654       7698 SALESMAN            1250
     3 ALLEN                7499       7698 SALESMAN            1600
     3 TURNER               7844       7698 SALESMAN            1500
     3 JAMES                7900       7698 CLERK                950
     3 WARD                 7521       7698 SALESMAN            1250
     3 MILLER               7934       7782 CLERK               1300
     3 FORD                 7902       7566 ANALYST             3000
     3 SCOTT                7788       7566 ANALYST             3000

9 rows selected.
```

```
SQL> SELECT
  2  LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, MGR, Job, Sal
  4  FROM Emp
  5  WHERE LEVEL BETWEEN 2 AND 4
  6  START WITH Job = 'PRESIDENT'
  7  CONNECT BY NOCYCLE PRIOR Empno = MGR;


ORG_CHART                 EMPNO        MGR JOB          SAL
-------------------- ---------- ---------- --------- ----------
  2 BLAKE                  7698       7839 MANAGER      2850
    3 MARTIN               7654       7698 SALESMAN     1250
    3 ALLEN                7499       7698 SALESMAN     1600
    3 TURNER               7844       7698 SALESMAN     1500
    3 JAMES                7900       7698 CLERK         950
    3 WARD                 7521       7698 SALESMAN     1250
  2 CLARK                  7782       7839 MANAGER      2450
    3 MILLER               7934       7782 CLERK        1300
  2 JONES                  7566       7839 MANAGER      2975
    3 FORD                 7902       7566 ANALYST      3000
      4 SMITH              7369       7902 CLERK         800


ORG_CHART                 EMPNO        MGR JOB          SAL
-------------------- ---------- ---------- --------- ----------
    3 SCOTT                7788       7566 ANALYST      3000
      4 ADAMS              7876       7788 CLERK        1100


13 rows selected.

SQL> cl scr

SQL> SELECT
  2  LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, MGR, Job, Sal
  4  FROM Emp
  5  WHERE Sal = (SELECT MAX(Sal)
  6                       FROM Emp
  7                       WHERE LEVEL = 2
  8                       START WITH Job = 'PRESIDENT'
  9                       CONNECT BY PRIOR Empno = MGR)
 10  START WITH Job = 'PRESIDENT'
 11  CONNECT BY NOCYCLE PRIOR Empno = MGR;


ORG_CHART                 EMPNO        MGR JOB          SAL
-------------------- ---------- ---------- --------- ----------
  2 JONES                  7566       7839 MANAGER      2975

SQL> cl scr

SQL> SELECT
  2  LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
  3  Empno, Dept.Deptno, Dname, Sal
  4  FROM Emp, Dept
  5  WHERE Sal > (SELECT MAX(Sal)
  6                       FROM Emp
  7                       WHERE LEVEL = 2
```

```
    8                          START WITH Job = 'PRESIDENT'
    9                          CONNECT BY PRIOR Empno = MGR) AND Dept.Deptno =
Emp.Deptno
   10   START WITH Job = 'PRESIDENT'
   11   CONNECT BY NOCYCLE PRIOR Empno = MGR;


ORG_CHART                 EMPNO     DEPTNO DNAME                 SAL
--------------------  ----------  ---------- ---------------  ----------
1 KING                     7839         10 ACCOUNTING         5000
    3 SCOTT                7788         20 RESEARCH           3000
    3 FORD                 7902         20 RESEARCH           3000

SQL> SELECT
    2   LPAD(LEVEL, ((2 * LEVEL) - 1))||' '||Ename Org_Chart,
    3   Empno, Dept.Deptno, Dname, Sal, Grade
    4   FROM Emp, Dept, SalGrade
    5   WHERE Sal > (SELECT MAX(Sal)
    6                     FROM Emp
    7                     WHERE LEVEL = 2
    8                     START WITH Job = 'PRESIDENT'
    9                     CONNECT BY PRIOR Empno = MGR) AND Dept.Deptno =
Emp.Deptno AND
   10                     Sal BETWEEN Losal AND HiSal
   11   START WITH Job = 'PRESIDENT'
   12   CONNECT BY NOCYCLE PRIOR Empno = MGR;


ORG_CHART                 EMPNO     DEPTNO DNAME                 SAL      GRADE
--------------------  ----------  ---------- ---------------  ----------  ----------
1 KING                     7839         10 ACCOUNTING         5000           5
    3 FORD                 7902         20 RESEARCH           3000           4
    3 SCOTT                7788         20 RESEARCH           3000           4

SQL> cl scr

SQL> SELECT LEVEL, MAX(Sal)
    2   FROM EMP
    3   CONNECT BY PRIOR Sal > Sal
    4   GROUP BY LEVEL;


     LEVEL    MAX(SAL)
---------- ----------
         1       5000
         2       3000
         3       2975
         4       2850
         5       2450
         6       1600
         7       1500
         8       1300
         9       1250
        10       1100
        11        950


     LEVEL    MAX(SAL)
---------- ----------
        12        800
```

```
12 rows selected.

SQL> ED
Wrote file afiedt.buf

  1   SELECT LEVEL, MIN(Sal)
  2   FROM EMP
  3   CONNECT BY PRIOR Sal < Sal
  4*  GROUP BY LEVEL
SQL> /

     LEVEL    MIN(SAL)
---------- ----------
         1        800
         2        950
         3       1100
         4       1250
         5       1300
         6       1500
         7       1600
         8       2450
         9       2850
        10       2975
        11       3000

     LEVEL    MIN(SAL)
---------- ----------
        12       5000

12 rows selected.

SQL> ED
Wrote file afiedt.buf

  1   SELECT MIN(Sal)
  2   FROM EMP
  3*  GROUP BY Sal
SQL> /

  MIN(SAL)
----------
       800
       950
      1100
      1250
      1300
      1500
      1600
      2450
      2850
      2975
      3000

  MIN(SAL)
----------
```

```
        5000

12 rows selected.

SQL> cl scr

SQL> ED
Wrote file afiedt.buf

  1   SELECT LEVEL, MAX(Ename)
  2   FROM EMP
  3   CONNECT BY PRIOR Ename > Ename
  4*  GROUP BY LEVEL;
SQL> /
GROUP BY LEVEL;
                 *
ERROR at line 4:
ORA-00911: invalid character


SQL> ED
Wrote file afiedt.buf

  1   SELECT LEVEL, MAX(Ename)
  2   FROM EMP
  3   CONNECT BY PRIOR Ename > Ename
  4*  GROUP BY LEVEL
SQL> /

     LEVEL MAX(ENAME)
---------- ----------
         1 WARD
         2 TURNER
         3 SMITH
         4 SCOTT
         5 MILLER
         6 MARTIN
         7 KING
         8 JONES
         9 JAMES
        10 FORD
        11 CLARK

     LEVEL MAX(ENAME)
---------- ----------
        12 BLAKE
        13 ALLEN
        14 ADAMS

14 rows selected.

SQL> ED
Wrote file afiedt.buf

  1   SELECT LEVEL, MIN(Ename)
  2   FROM EMP
```

```
  3  CONNECT BY PRIOR Ename < Ename
  4* GROUP BY LEVEL
SQL> /

     LEVEL MIN(ENAME)
---------- ----------
         1 ADAMS
         2 ALLEN
         3 BLAKE
         4 CLARK
         5 FORD
         6 JAMES
         7 JONES
         8 KING
         9 MARTIN
        10 MILLER
        11 SCOTT

     LEVEL MIN(ENAME)
---------- ----------
        12 SMITH
        13 TURNER
        14 WARD

14 rows selected.

SQL> ED
Wrote file afiedt.buf

  1  SELECT LEVEL, MIN(HireDate)
  2  FROM EMP
  3  CONNECT BY PRIOR HireDate < HireDate
  4* GROUP BY LEVEL
SQL> /

     LEVEL MIN(HIRED
---------- ---------
         1 17-DEC-80
         2 20-FEB-81
         3 22-FEB-81
         4 02-APR-81
         5 01-MAY-81
         6 09-JUN-81
         7 08-SEP-81
         8 28-SEP-81
         9 17-NOV-81
        10 03-DEC-81
        11 23-JAN-82

     LEVEL MIN(HIRED
---------- ---------
        12 09-DEC-82
        13 12-JAN-83

13 rows selected.
```

```
SQL> ED
Wrote file afiedt.buf

  1   SELECT LEVEL, MAX(HireDate)
  2   FROM EMP
  3   CONNECT BY PRIOR HireDate < HireDate
  4*  GROUP BY LEVEL
SQL> /

     LEVEL MAX(HIRED
---------- ---------
         1 12-JAN-83
         2 12-JAN-83
         3 12-JAN-83
         4 12-JAN-83
         5 12-JAN-83
         6 12-JAN-83
         7 12-JAN-83
         8 12-JAN-83
         9 12-JAN-83
        10 12-JAN-83
        11 12-JAN-83

     LEVEL MAX(HIRED
---------- ---------
        12 12-JAN-83
        13 12-JAN-83

13 rows selected.

SQL> ED
Wrote file afiedt.buf

  1   SELECT LEVEL, MAX(HireDate)
  2   FROM EMP
  3   CONNECT BY PRIOR HireDate > HireDate
  4*  GROUP BY LEVEL
SQL> /

     LEVEL MAX(HIRED
---------- ---------
         1 12-JAN-83
         2 09-DEC-82
         3 23-JAN-82
         4 03-DEC-81
         5 17-NOV-81
         6 28-SEP-81
         7 08-SEP-81
         8 09-JUN-81
         9 01-MAY-81
        10 02-APR-81
        11 22-FEB-81

     LEVEL MAX(HIRED
---------- ---------
        12 20-FEB-81
```

```
        13 17-DEC-80

13 rows selected.

SQL> cl scr

SQL> ED
Wrote file afiedt.buf

  1   SELECT LEVEL, MAX(Ename), MAX(HireDate)
  2   FROM EMP
  3   CONNECT BY PRIOR HireDate > HireDate
  4*  GROUP BY LEVEL
SQL> /

     LEVEL MAX(ENAME) MAX(HIRED
---------- ---------- ---------
         1 WARD       12-JAN-83
         2 WARD       09-DEC-82
         3 WARD       23-JAN-82
         4 WARD       03-DEC-81
         5 WARD       17-NOV-81
         6 WARD       28-SEP-81
         7 WARD       08-SEP-81
         8 WARD       09-JUN-81
         9 WARD       01-MAY-81
        10 WARD       02-APR-81
        11 WARD       22-FEB-81

     LEVEL MAX(ENAME) MAX(HIRED
---------- ---------- ---------
        12 SMITH      20-FEB-81
        13 SMITH      17-DEC-80

13 rows selected.

SQL> cl scr

SQL> SELECT LEVEL, MAX(Sal)
  2   FROM EMP
  3   CONNECT BY PRIOR Sal > Sal
  4   GROUP BY LEVEL;

     LEVEL   MAX(SAL)
---------- ----------
         1       5000
         2       3000
         3       2975
         4       2850
         5       2450
         6       1600
         7       1500
         8       1300
         9       1250
        10       1100
        11        950
```

```
      LEVEL    MAX(SAL)
---------- ----------
        12        800

12 rows selected.

SQL> cl scr

SQL> SELECT LEVEL, MAX(Sal)
  2  FROM EMP
  3  WHERE LEVEL = &LEVELNO
  4  CONNECT BY PRIOR Sal > Sal
  5  GROUP BY LEVEL;
Enter value for levelno: 1

      LEVEL    MAX(SAL)
---------- ----------
         1       5000

SQL> /
Enter value for levelno: 2

      LEVEL    MAX(SAL)
---------- ----------
         2       3000

SQL> /
Enter value for levelno: 3

      LEVEL    MAX(SAL)
---------- ----------
         3       2975

SQL> SELECT Ename, Sal, Deptno, Job
  2  FROM Emp
  3  WHERE Sal = (SELECT MAX(Sal)
  4               FROM EMP
  5               WHERE LEVEL = &LEVELNO
  6               CONNECT BY PRIOR Sal > Sal
  7               GROUP BY LEVEL);
Enter value for levelno: 1

ENAME             SAL     DEPTNO JOB
---------- ---------- ---------- ---------
KING             5000         10 PRESIDENT

SQL> /
Enter value for levelno: 2

ENAME             SAL     DEPTNO JOB
---------- ---------- ---------- ---------
FORD             3000         20 ANALYST
SCOTT            3000         20 ANALYST

SQL> /
```

```
Enter value for levelno: 3

ENAME                SAL       DEPTNO JOB
---------- ---------- ---------- ---------
JONES               2975           20 MANAGER

SQL> cl scr

SQL> SELECT LEVEL, MIN(Sal)
  2  FROM EMP
  3  WHERE LEVEL = &LEVELNO
  4  CONNECT BY PRIOR Sal < Sal
  5  GROUP BY LEVEL;
Enter value for levelno: 1

     LEVEL   MIN(SAL)
---------- ----------
         1        800

SQL> /
Enter value for levelno: 2

     LEVEL   MIN(SAL)
---------- ----------
         2        950

SQL> SELECT Ename, Sal, Deptno, Job
  2  FROM Emp
  3  WHERE Sal = (SELECT MIN(Sal)
  4              FROM EMP
  5              WHERE LEVEL = &LEVELNO
  6              CONNECT BY PRIOR Sal < Sal
  7              GROUP BY LEVEL);
Enter value for levelno: 1

ENAME                SAL       DEPTNO JOB
---------- ---------- ---------- ---------
SMITH                800           20 CLERK

SQL> /
Enter value for levelno: 2

ENAME                SAL       DEPTNO JOB
---------- ---------- ---------- ---------
JAMES                950           30 CLERK

SQL> /
Enter value for levelno: 3

ENAME                SAL       DEPTNO JOB
---------- ---------- ---------- ---------
ADAMS               1100           20 CLERK

SQL> cl scr

SQL> SELECT LEVEL, MIN(HireDate) Senior
```

```
  2   FROM EMP
  3   WHERE LEVEL = &LEVELNO
  4   CONNECT BY PRIOR HireDate < HireDate
  5   GROUP BY LEVEL;
Enter value for levelno: 1


     LEVEL SENIOR
---------- ---------
         1 17-DEC-80


SQL> /
Enter value for levelno: 5


     LEVEL SENIOR
---------- ---------
         5 01-MAY-81


SQL> SELECT Ename, Sal, HireDate
  2   FROm Emp
  3   WHERE HireDate = (SELECT MIN(HireDate)
  4                            FROM EMP
  5                            WHERE LEVEL = &LEVELNO
  6                            CONNECT BY
  7                            PRIOR HireDate < HireDate
  8                            GROUP BY LEVEL);
Enter value for levelno: 1


ENAME             SAL HIREDATE
---------- ---------- ---------
SMITH             800 17-DEC-80


SQL> /
Enter value for levelno: 6


ENAME             SAL HIREDATE
---------- ---------- ---------
CLARK            2450 09-JUN-81


SQL> /
Enter value for levelno: 2


ENAME             SAL HIREDATE
---------- ---------- ---------
ALLEN            1600 20-FEB-81


SQL> cl scr

SQL> COLUMN "Path" FORMAT A30
SQL> SELECT
  2   Ename Employee,
  3   CONNECT_BY_ROOT Ename "Manager",
  4   LEVEL - 1 "Pathlen",
  5   SYS_CONNECT_BY_PATH(Ename, '/') "Path"
  6   FROM Emp
  7   WHERE LEVEL > 1 AND Deptno = &Deptno
  8   CONNECT BY PRIOR Empno = MGR;
```

```
Enter value for deptno: 20

EMPLOYEE    Manager        Pathlen Path
---------- ---------- ---------- -------------------------------
SMITH      FORD                1 /FORD/SMITH
ADAMS      SCOTT               1 /SCOTT/ADAMS
FORD       JONES               1 /JONES/FORD
SMITH      JONES               2 /JONES/FORD/SMITH
SCOTT      JONES               1 /JONES/SCOTT
ADAMS      JONES               2 /JONES/SCOTT/ADAMS
JONES      KING                1 /KING/JONES
FORD       KING                2 /KING/JONES/FORD
SMITH      KING                3 /KING/JONES/FORD/SMITH
SCOTT      KING                2 /KING/JONES/SCOTT
ADAMS      KING                3 /KING/JONES/SCOTT/ADAMS

11 rows selected.

SQL> cl scr

SQL> SELECT
  2  Name,
  3  SUM(Sal) "Total Salary"
  4  FROM (
  5          SELECT
  6          CONNECT_BY_ROOT Ename AS Name,
  7          Sal
  8          FROM Emp
  9          WHERE Deptno = &GiveDeptno
 10          CONNECT BY PRIOR Empno = MGR
 11          )
 12  GROUP BY Name;
Enter value for givedeptno: 20

NAME       Total Salary
---------- ------------
ADAMS              1100
FORD               3800
JONES             10875
KING              10875
SCOTT              4100
SMITH               800

6 rows selected.

SQL> SELECT SUM(Sal) FROm Emp;

  SUM(SAL)
----------
     29025

SQL> cl ascr
SP2-0158: unknown CLEAR option "ascr"
SQL> cl scr

SQL> SELECT
```

```
  2   Ename Employee,
  3   CONNECT_BY_ROOT Empno "Root",
  4   LEVEL,
  5   SYS_CONNECT_BY_PATH(Ename, '/')  NamePath
  6   FROM Emp
  7   WHERE Level <= 4 AND Deptno = &GiveDeptno
  8   START WITH Ename = 'KING'
  9   CONNECT BY NOCYCLE PRIOR Empno = MGR AND
 10   LEVEL <= 4;
Enter value for givedeptno: 30


EMPLOYEE        Root        LEVEL
---------- ---------- ----------
NAMEPATH
--------------------------------------------------------------------------------
BLAKE           7839            2
/KING/BLAKE


MARTIN          7839            3
/KING/BLAKE/MARTIN


ALLEN           7839            3
/KING/BLAKE/ALLEN



EMPLOYEE        Root        LEVEL
---------- ---------- ----------
NAMEPATH
--------------------------------------------------------------------------------
TURNER          7839            3
/KING/BLAKE/TURNER


JAMES           7839            3
/KING/BLAKE/JAMES


WARD            7839            3
/KING/BLAKE/WARD



6 rows selected.

SQL> COLUMN NAMEPATH FORMAT A30
SQL> /
Enter value for givedeptno: 30


EMPLOYEE        Root        LEVEL NAMEPATH
---------- ---------- ---------- ------------------------------
BLAKE           7839            2 /KING/BLAKE
MARTIN          7839            3 /KING/BLAKE/MARTIN
ALLEN           7839            3 /KING/BLAKE/ALLEN
TURNER          7839            3 /KING/BLAKE/TURNER
JAMES           7839            3 /KING/BLAKE/JAMES
WARD            7839            3 /KING/BLAKE/WARD

6 rows selected.
```

```
SQL> cl scr

SQL> SELECT ROWNUM, Ename, Sal, Deptno
  2  FROM Emp;

    ROWNUM ENAME             SAL     DEPTNO
---------- ---------- ---------- ----------
         1 KING             5000         10
         2 BLAKE            2850         30
         3 CLARK            2450         10
         4 JONES            2975         20
         5 MARTIN           1250         30
         6 ALLEN            1600         30
         7 TURNER           1500         30
         8 JAMES             950         30
         9 WARD             1250         30
        10 FORD             3000         20
        11 SMITH             800         20

    ROWNUM ENAME             SAL     DEPTNO
---------- ---------- ---------- ----------
        12 SCOTT            3000         20
        13 ADAMS            1100         20
        14 MILLER           1300         10

14 rows selected.

SQL> ED
Wrote file afiedt.buf

  1  SELECT ROWNUM, Ename, Sal, Deptno
  2  FROM Emp
  3* WHERE Deptno = 30
SQL> /

    ROWNUM ENAME             SAL     DEPTNO
---------- ---------- ---------- ----------
         1 BLAKE            2850         30
         2 MARTIN           1250         30
         3 ALLEN            1600         30
         4 TURNER           1500         30
         5 JAMES             950         30
         6 WARD             1250         30

6 rows selected.

SQL> ED
Wrote file afiedt.buf

  1  SELECT ROWNUM, Ename, Sal, Deptno
  2  FROM Emp
  3* WHERE Deptno = 10
SQL> /

    ROWNUM ENAME             SAL     DEPTNO
---------- ---------- ---------- ----------
```

```
         1 KING              5000           10
         2 CLARK             2450           10
         3 MILLER            1300           10

SQL> ED
Wrote file afiedt.buf

  1   SELECT ROWNUM, Ename, Sal, Deptno
  2   FROM Emp
  3*  ORDER BY Sal
SQL> /

    ROWNUM ENAME                 SAL     DEPTNO
---------- ---------- ---------- ----------
        11 SMITH                 800         20
         8 JAMES                 950         30
        13 ADAMS                1100         20
         5 MARTIN               1250         30
         9 WARD                 1250         30
        14 MILLER               1300         10
         7 TURNER               1500         30
         6 ALLEN                1600         30
         3 CLARK                2450         10
         2 BLAKE                2850         30
         4 JONES                2975         20

    ROWNUM ENAME                 SAL     DEPTNO
---------- ---------- ---------- ----------
        10 FORD                 3000         20
        12 SCOTT                3000         20
         1 KING                 5000         10

14 rows selected.

SQL> SPOOL OFF
SQL> cl scr

SQL> SELECT ROWNUM, Ename, Sal
  2   FROM Emp;

    ROWNUM ENAME                 SAL
---------- ---------- ----------
         1 KING                 5000
         2 BLAKE                2850
         3 CLARK                2450
         4 JONES                2975
         5 MARTIN               1250
         6 ALLEN                1600
         7 TURNER               1500
         8 JAMES                 950
         9 WARD                 1250
        10 FORD                 3000
        11 SMITH                 800

    ROWNUM ENAME                 SAL
---------- ---------- ----------
```

```
        12 SCOTT              3000
        13 ADAMS              1100
        14 MILLER             1300

14 rows selected.

SQL> ED
Wrote file afiedt.buf

  1   SELECT ROWNUM, Ename, Sal
  2   FROM Emp
  3*  WHERE ROWNUM = 1
SQL> /

    ROWNUM ENAME               SAL
---------- ---------- ----------
         1 KING               5000

SQL> ED
Wrote file afiedt.buf

  1   SELECT ROWNUM, Ename, Sal
  2   FROM Emp
  3*  WHERE ROWNUM = 2
SQL> /

no rows selected

SQL> ED
Wrote file afiedt.buf

  1   SELECT ROWNUM, Ename, Sal
  2   FROM Emp
  3*  WHERE ROWNUM <= 5
SQL> /

    ROWNUM ENAME               SAL
---------- ---------- ----------
         1 KING               5000
         2 BLAKE              2850
         3 CLARK              2450
         4 JONES              2975
         5 MARTIN             1250

SQL> ED
Wrote file afiedt.buf

  1   SELECT ROWNUM, Ename, Sal
  2   FROM Emp
  3*  WHERE ROWNUM >= 5
SQL> /

no rows selected

SQL> cl scr
```

```
SQL> COLUMN SelectGraph FORMAT A16
SQL> SELECT
  2  Ename,
  3  LPAD('*' , ROWNUM, '*') SelectGraph
  4  FROM Emp;

ENAME        SELECTGRAPH
----------   ----------------
KING         *
BLAKE        **
CLARK        ***
JONES        ****
MARTIN       *****
ALLEN        ******
TURNER       *******
JAMES        ********
WARD         *********
FORD         **********
SMITH        ***********

ENAME        SELECTGRAPH
----------   ----------------
SCOTT        ************
ADAMS        *************
MILLER       **************

14 rows selected.

SQL> SELECT ROWNUM, Ename
  2  FROM Emp;

    ROWNUM ENAME
---------- ----------
         1 KING
         2 BLAKE
         3 CLARK
         4 JONES
         5 MARTIN
         6 ALLEN
         7 TURNER
         8 JAMES
         9 WARD
        10 FORD
        11 SMITH

    ROWNUM ENAME
---------- ----------
        12 SCOTT
        13 ADAMS
        14 MILLER

14 rows selected.

SQL> SELECT ROWNUM, Ename, Sal
  2  FROM Emp
  3  ORDER BY Sal;
```

```
    ROWNUM ENAME             SAL
---------- ---------- ----------
        11 SMITH             800
         8 JAMES             950
        13 ADAMS            1100
         5 MARTIN           1250
         9 WARD             1250
        14 MILLER           1300
         7 TURNER           1500
         6 ALLEN            1600
         3 CLARK            2450
         2 BLAKE            2850
         4 JONES            2975

    ROWNUM ENAME             SAL
---------- ---------- ----------
        10 FORD             3000
        12 SCOTT            3000
         1 KING             5000

14 rows selected.

SQL> cl scr

SQL> ED
Wrote file afiedt.buf

  1  SELECT
  2  Ename, Sal,
  3  LPAD('*' , ROWNUM, '*') SelectGraph
  4  FROM Emp
  5* ORDER BY Sal
SQL> /

ENAME             SAL SELECTGRAPH
---------- ---------- ----------------
SMITH             800 **********
JAMES             950 ********
ADAMS            1100 ************
MARTIN           1250 *****
WARD             1250 *********
MILLER           1300 **************
TURNER           1500 *******
ALLEN            1600 ******
CLARK            2450 ***
BLAKE            2850 **
JONES            2975 ****

ENAME             SAL SELECTGRAPH
---------- ---------- ----------------
FORD             3000 **********
SCOTT            3000 ************
KING             5000 *

14 rows selected.
```

```
SQL> cl scr

SQL> COLUMN SelectGraph FORMAT A16
SQL> COLUMN RecGraph FORMAT A20
SQL> COLUMN SalGraph FORMAT A20
SQL> SELECT
  2  Ename,
  3  LPAD('*' , ROWNUM, '*' ) SelectGraph,
  4  LPAD('*', Sal/500, '*') SalGraph,
  5  LPAD('*', (SYSDATE-HireDate)/500, '*') RecGraph
  6  FROM Emp;

ENAME      SELECTGRAPH      SALGRAPH             RECGRAPH
---------- ---------------- -------------------- --------------------
KING       *                *********            *******************
                                                 *

BLAKE      **               *****                *******************
                                                 *

CLARK      ***              ****                 *******************
                                                 *

JONES      ****             *****                *******************
                                                 *


ENAME      SELECTGRAPH      SALGRAPH             RECGRAPH
---------- ---------------- -------------------- --------------------

MARTIN     *****            **                   *******************
                                                 *

ALLEN      ******           ***                  *******************
                                                 *

TURNER     *******          ***                  *******************
                                                 *

JAMES      ********         *                    *******************

ENAME      SELECTGRAPH      SALGRAPH             RECGRAPH
---------- ---------------- -------------------- --------------------
WARD       ********         **                   *******************
                                                 *

FORD       *********        ******               *******************
SMITH      **********       *                    *******************
                                                 *

SCOTT      ***********      ******               *******************
ADAMS      ************     **                   *******************
MILLER     *************    **                   *******************

14 rows selected.
```

```
SQL> COLUMN SelectGraph FORMAT A15
SQL> COLUMN SALGRAPH FORMAT A18
SQL> COLUMN RecGraph FORMAT A35
SQL> /

ENAME       SELECTGRAPH     SALGRAPH
---------- --------------- ------------------
RECGRAPH
-----------------------------------
KING        *               *********
********************

BLAKE       **              *****
********************

CLARK       ***             ****
********************


ENAME       SELECTGRAPH     SALGRAPH
---------- --------------- ------------------
RECGRAPH
-----------------------------------
JONES       ****            *****
********************

MARTIN      *****           **
********************

ALLEN       ******          ***
********************


ENAME       SELECTGRAPH     SALGRAPH
---------- --------------- ------------------
RECGRAPH
-----------------------------------
TURNER      *******         ***
********************

JAMES       ********        *
********************

WARD        *********       **
********************


ENAME       SELECTGRAPH     SALGRAPH
---------- --------------- ------------------
RECGRAPH
-----------------------------------
FORD        *********       ******
********************

SMITH       **********      *
********************
```

```
SCOTT        ************   ******
********************


ENAME        SELECTGRAPH    SALGRAPH
---------- --------------- ------------------
RECGRAPH
-----------------------------------
ADAMS        *************  **
*******************

MILLER       *************  **
*******************


14 rows selected.

SQL> COLUMN RecGraph FORMAT A30
SQL> /

ENAME        SELECTGRAPH    SALGRAPH             RECGRAPH
---------- --------------- ------------------  -------------------------------
KING         *              *********           ********************
BLAKE        **             *****               ********************
CLARK        ***            ****                ********************
JONES        ****           *****               ********************
MARTIN       *****          **                  ********************
ALLEN        ******         ***                 ********************
TURNER       *******        ***                 ********************
JAMES        ********       *                   *******************
WARD         *********      **                  ********************
FORD         **********     ******              *******************
SMITH        ***********    *                   ********************

ENAME        SELECTGRAPH    SALGRAPH             RECGRAPH
---------- --------------- ------------------  -------------------------------
SCOTT        ************   ******              *******************
ADAMS        *************  **                  *******************
MILLER       *************  **                  *******************

14 rows selected.

SQL> cl scr

SQL> R
  1  SELECT
  2  Ename,
  3  LPAD('*' , ROWNUM, '*' ) SelectGraph,
  4  LPAD('*', Sal/500, '*') SalGraph,
  5  LPAD('*', (SYSDATE-HireDate)/500, '*') RecGraph
  6* FROM Emp

ENAME        SELECTGRAPH    SALGRAPH             RECGRAPH
---------- --------------- ------------------  -------------------------------
KING         *              *********           ********************
```

```
BLAKE        **                 *****              ********************
CLARK        ***                ****               *******************
JONES        ****               *****              ********************
MARTIN       *****              **                 ********************
ALLEN        ******             ***                ********************
TURNER       *******            ***                ********************
JAMES        ********           *                  *******************
WARD         *********          **                 *******************
FORD         **********         ******             *******************
SMITH        ***********        *                  ********************

ENAME        SELECTGRAPH        SALGRAPH           RECGRAPH
----------   ---------------    -----------------  ------------------------------
SCOTT        ***********        ******             *******************
ADAMS        *************      **                 *******************
MILLER       **************     **                 *******************

14 rows selected.

SQL> cl scr

SQL> COLUMN Org_Chart FORMAT A15
SQL> SELECT
  2  LPAD('*', ((2 * LEVEL) - 1))||Ename Org_Chart,
  3  Empno, MGR, Job
  4  FROM Emp
  5  START WITH Job = 'PRESIDENT'
  6  CONNECT BY PRIOR Empno = MGR;

ORG_CHART            EMPNO         MGR JOB
---------------   ----------  ----------  ---------
*KING                  7839              PRESIDENT
  *BLAKE               7698        7839 MANAGER
    *MARTIN            7654        7698 SALESMAN
    *ALLEN             7499        7698 SALESMAN
    *TURNER            7844        7698 SALESMAN
    *JAMES             7900        7698 CLERK
    *WARD              7521        7698 SALESMAN
  *CLARK               7782        7839 MANAGER
    *MILLER            7934        7782 CLERK
  *JONES               7566        7839 MANAGER
    *FORD              7902        7566 ANALYST

ORG_CHART            EMPNO         MGR JOB
---------------   ----------  ----------  ---------
      *SMITH          7369        7902 CLERK
    *SCOTT            7788        7566 ANALYST
      *ADAMS          7876        7788 CLERK

14 rows selected.

SQL> ED
Wrote file afiedt.buf

  1  SELECT
  2  LPAD('*', ((2 * LEVEL) - 1)) LevelVAL, Ename Org_Chart
```

```
   3   FROM Emp
   4   START WITH Job = 'PRESIDENT'
   5*  CONNECT BY PRIOR Empno = MGR
SQL> /


LEVELVAL
--------------------------------------------------------------------------------
ORG_CHART
--------------
*
KING

   *
BLAKE

      *
MARTIN


LEVELVAL
--------------------------------------------------------------------------------
ORG_CHART
--------------
      *
ALLEN

      *
TURNER

      *
JAMES


LEVELVAL
--------------------------------------------------------------------------------
ORG_CHART
--------------
      *
WARD

   *
CLARK

      *
MILLER


LEVELVAL
--------------------------------------------------------------------------------
ORG_CHART
--------------
      *
JONES

      *
FORD
```

```
             *
SMITH


LEVELVAL
--------------------------------------------------------------------------------
ORG_CHART
---------------
      *
SCOTT

         *
ADAMS


14 rows selected.

SQL> COLUMN LEVELVAL FORMAT A15
SQL> /

LEVELVAL        ORG_CHART
--------------- ---------------
*               KING
   *            BLAKE
      *         MARTIN
      *         ALLEN
      *         TURNER
      *         JAMES
      *         WARD
    *           CLARK
      *         MILLER
   *            JONES
      *         FORD

LEVELVAL        ORG_CHART
--------------- ---------------
         *      SMITH
      *         SCOTT
        *       ADAMS


14 rows selected.

SQL> cl scr

SQL> SELECT ROWNUM "S.No", SUM(ROWNUM) Sum
  2  FROM Emp
  3  WHERE ROWNUM <= &GSeqVal;
Enter value for gseqval: 5
SELECT ROWNUM "S.No", SUM(ROWNUM) Sum
         *
ERROR at line 1:
ORA-00937: not a single-group group function


SQL> ED
```

```
Wrote file afiedt.buf

  1   SELECT ROWNUM "S.No", SUM(ROWNUM) Sum
  2   FROM Emp
  3   WHERE ROWNUM <= &GSeqVal
  4*  GROUP BY ROWNUM
SQL> /
Enter value for gseqval: 5

      S.No         SUM
---------- ----------
         1          1
         2          2
         3          3
         4          4
         5          5

SQL> cl scr

SQL> SELECT ROWNUM, Ename, Sal
  2   FROM Emp
  3   WHERE ROWNUM < 6
  4   ORDER BY Sal DESC;

    ROWNUM ENAME            SAL
---------- ---------- ----------
         1 KING            5000
         4 JONES           2975
         2 BLAKE           2850
         3 CLARK           2450
         5 MARTIN          1250

SQL> SELECT *
  2   FROM (SELECT Ename, Sal, Deptno, Job
  3            FROM Emp
  4            ORDER BY Sal DESC)
  5   WHERE ROWNUM < 6;

ENAME            SAL     DEPTNO JOB
---------- ---------- ---------- ---------
KING            5000         10 PRESIDENT
FORD            3000         20 ANALYST
SCOTT           3000         20 ANALYST
JONES           2975         20 MANAGER
BLAKE           2850         30 MANAGER

SQL> cl scr

SQL> SELECT LEVEL, ROWNUM, Ename, Sal
  2   FROM Emp
  3   WHERE ROWNUM < 6
  4   START WITH Ename = 'KING'
  5   CONNECT BY PRIOR Empno = MGR
  6   ORDER BY Sal DESC;

     LEVEL     ROWNUM ENAME                SAL
```

```
---------- ---------- ---------- ----------
         1          1 KING             5000
         2          2 BLAKE            2850
         3          4 ALLEN            1600
         3          5 TURNER           1500
         3          3 MARTIN           1250

SQL> cl scr

SQL> SELECT ROWNUM, E1.*
  2  FROM (SELECT ROWNUM, Ename, Sal, Deptno, Job
  3          FROM Emp
  4          ORDER BY Sal DESC) E1
  5  WHERE ROWNUM < 6;

    ROWNUM     ROWNUM ENAME             SAL     DEPTNO JOB
---------- ---------- ---------- ---------- ---------- ---------
         1          1 KING             5000         10 PRESIDENT
         2         10 FORD             3000         20 ANALYST
         3         12 SCOTT            3000         20 ANALYST
         4          4 JONES            2975         20 MANAGER
         5          2 BLAKE            2850         30 MANAGER

SQL> cl scr

SQL> SELECT RN, Ename, Sal
  2  FROM (SELECT ROWNUM RN, Ename, Sal
  3          FROM Emp)
  4  WHERE RN = &GiveRn;
Enter value for givern: 1

        RN ENAME             SAL
---------- ---------- ----------
         1 KING             5000

SQL> /
Enter value for givern: 2

        RN ENAME             SAL
---------- ---------- ----------
         2 BLAKE            2850

SQL> /
Enter value for givern: 3

        RN ENAME             SAL
---------- ---------- ----------
         3 CLARK            2450

SQL> cl scr

SQL> SELECT ROWNUM, Ename, Sal, Deptno
  2  FROM Emp
  3  GROUP BY ROWNUM, Ename, Sal, Deptno
  4  HAVING ROWNUM = &GRownum;
Enter value for grownum: 1
```

```
    ROWNUM ENAME            SAL     DEPTNO
---------- ---------- ---------- ----------
         1 KING            5000         10

SQL> /
Enter value for grownum: 2

    ROWNUM ENAME            SAL     DEPTNO
---------- ---------- ---------- ----------
         2 BLAKE           2850         30

SQL> /
Enter value for grownum: 3

    ROWNUM ENAME            SAL     DEPTNO
---------- ---------- ---------- ----------
         3 CLARK           2450         10

SQL> cl scr

SQL> SELECT RN, E2.Ename, E2.Sal
  2  FROM (SELECT ROWNUM RN, E1.*
  3     FROM (SELECT Ename, Sal, Deptno, Job
  4             FROM Emp
  5             ORDER BY Sal DESC) E1) E2
  6  WHERE RN = &GiveSalNum;
Enter value for givesalnum: 1

        RN ENAME            SAL
---------- ---------- ----------
         1 KING            5000

SQL> /
Enter value for givesalnum: 2

        RN ENAME            SAL
---------- ---------- ----------
         2 FORD            3000

SQL> SELECT Ename, Sal, E.Deptno, Dname, Grade
  2  FROM Emp E, Dept D, Salgrade S
  3  WHERE Sal IN (SELECT E2.Sal
  4          FROM (SELECT ROWNUM RN, E1.*
  5                   FROM (SELECT Ename, Sal, Deptno, Job
  6                          FROM Emp
  7                          ORDER BY Sal DESC) E1) E2
  8          WHERE E2.RN = &Rn)
  9  AND E.Deptno = D.Deptno AND
 10  E.Sal BETWEEN S.Losal AND S.HiSal;
Enter value for rn: 1

ENAME            SAL     DEPTNO DNAME          GRADE
---------- ---------- ---------- -------------- ----------
KING            5000         10 ACCOUNTING          5
```

```
SQL> /
Enter value for rn: 2

ENAME            SAL      DEPTNO DNAME              GRADE
---------- ---------- ---------- -------------- ----------
SCOTT           3000          20 RESEARCH            4
FORD            3000          20 RESEARCH            4

SQL> cl scr

SQL> SELECT RN, Ename, Sal
  2  FROM (SELECT ROWNUM RN, Ename, Sal
  3        FROM Emp)
  4  WHERE MOD(RN, 2) = 0;

        RN ENAME            SAL
---------- ---------- ----------
         2 BLAKE           2850
         4 JONES           2975
         6 ALLEN           1600
         8 JAMES            950
        10 FORD            3000
        12 SCOTT           3000
        14 MILLER          1300

7 rows selected.

SQL> ED
Wrote file afiedt.buf

  1  SELECT RN, Ename, Sal
  2  FROM (SELECT ROWNUM RN, Ename, Sal
  3        FROM Emp)
  4* WHERE MOD(RN, 2) = 1
SQL> /

        RN ENAME            SAL
---------- ---------- ----------
         1 KING            5000
         3 CLARK           2450
         5 MARTIN          1250
         7 TURNER          1500
         9 WARD            1250
        11 SMITH            800
        13 ADAMS           1100

7 rows selected.

SQL> cl scr

SQL> SELECT RN, Ename, Sal
  2  FROM (SELECT ROWNUM RN, Ename, Sal
  3        FROM Emp)
  4  WHERE RN BETWEEN &GineRn1 AND &GiveRn2;
Enter value for ginern1: 1
Enter value for givern2: 5
```

```
        RN ENAME            SAL
---------- ---------- ----------
         1 KING             5000
         2 BLAKE            2850
         3 CLARK            2450
         4 JONES            2975
         5 MARTIN           1250

SQL> /
Enter value for ginern1: 6
Enter value for givern2: 10

        RN ENAME            SAL
---------- ---------- ----------
         6 ALLEN            1600
         7 TURNER           1500
         8 JAMES             950
         9 WARD             1250
        10 FORD             3000

SQL> /
Enter value for ginern1: 11
Enter value for givern2: 16

        RN ENAME            SAL
---------- ---------- ----------
        11 SMITH             800
        12 SCOTT            3000
        13 ADAMS            1100
        14 MILLER           1300

SQL> cl scr

SQL> SELECT ROWNUM, Ename, Sal
  2  FROM Emp
  3  GROUP BY ROWNUM, Ename, Sal
  4  HAVING ROWNUM BETWEEN &GiveRowNum1 AND &GiveRowNum2;
Enter value for giverownum1: 1
Enter value for giverownum2: 5

    ROWNUM ENAME            SAL
---------- ---------- ----------
         1 KING             5000
         2 BLAKE            2850
         3 CLARK            2450
         4 JONES            2975
         5 MARTIN           1250

SQL> /
Enter value for giverownum1: 6
Enter value for giverownum2: 10

    ROWNUM ENAME            SAL
---------- ---------- ----------
         6 ALLEN            1600
```

```
         7 TURNER            1500
         8 JAMES              950
         9 WARD              1250
        10 FORD              3000

SQL> /
Enter value for giverownum1: 11
Enter value for giverownum2: 15

    ROWNUM ENAME             SAL
---------- ---------- ----------
        11 SMITH              800
        12 SCOTT             3000
        13 ADAMS             1100
        14 MILLER            1300

SQL> cl scr

SQL> SELECT Ename, Sal, E.Deptno, Dname, Grade
  2  FROM Emp E, Dept D, Salgrade S
  3  WHERE Sal IN (SELECT E2.Sal
  4    FROM (SELECT ROWNUM RN, E1.*
  5        FROM (SELECT Ename, Sal, Deptno, Job
  6              FROM Emp
  7              ORDER BY Sal DESC) E1) E2
  8    WHERE E2.RN BETWEEN &RN1 AND &RN2)
  9  AND E.Deptno = D.Deptno AND
 10  E.Sal BETWEEN S.Losal AND S.HiSal;
Enter value for rn1: 1
Enter value for rn2: 6

ENAME             SAL     DEPTNO DNAME              GRADE
---------- ---------- ---------- -------------- ----------
KING             5000         10 ACCOUNTING             5
SCOTT            3000         20 RESEARCH               4
FORD             3000         20 RESEARCH               4
JONES            2975         20 RESEARCH               4
BLAKE            2850         30 SALES                  4
CLARK            2450         10 ACCOUNTING             4

6 rows selected.

SQL> cl scr

SQL> SELECT ROWID, Ename, Sal, Deptno
  2  FROM Emp;

ROWID              ENAME             SAL     DEPTNO
------------------ ---------- ---------- ----------
AAANCuAAEAAAAG/AAA KING             5000         10
AAANCuAAEAAAAG/AAB BLAKE            2850         30
AAANCuAAEAAAAG/AAC CLARK            2450         10
AAANCuAAEAAAAG/AAD JONES            2975         20
AAANCuAAEAAAAG/AAE MARTIN           1250         30
AAANCuAAEAAAAG/AAF ALLEN            1600         30
AAANCuAAEAAAAG/AAG TURNER           1500         30
```

```
AAANCuAAEAAAAG/AAH JAMES              950          30
AAANCuAAEAAAAG/AAI WARD              1250          30
AAANCuAAEAAAAG/AAJ FORD              3000          20
AAANCuAAEAAAAG/AAK SMITH             800          20

ROWID              ENAME            SAL      DEPTNO
------------------ ---------- ---------- ----------
AAANCuAAEAAAAG/AAL SCOTT            3000          20
AAANCuAAEAAAAG/AAM ADAMS            1100          20
AAANCuAAEAAAAG/AAN MILLER           1300          10

14 rows selected.

SQL> SELECT ROWID, Ename, Sal, Deptno
  2  FROM Emp
  3  WHERE ROWID =
  4  'AAANCuAAEAAAAG/AAI';

ROWID              ENAME            SAL      DEPTNO
------------------ ---------- ---------- ----------
AAANCuAAEAAAAG/AAI WARD             1250          30

SQL> SET AUTOTRACE ON EXPLAIN
SQL> SELECT ROWID, Ename, Sal, Deptno
  2  FROM Emp
  3  WHERE Ename = 'WARD';

ROWID              ENAME            SAL      DEPTNO
------------------ ---------- ---------- ----------
AAANCuAAEAAAAG/AAI WARD             1250          30


Execution Plan
-----------------------------------------------------------
   0      SELECT STATEMENT Optimizer=ALL_ROWS (Cost=3 Card=1 Bytes=20)
   1    0    TABLE ACCESS (FULL) OF 'EMP' (TABLE) (Cost=3 Card=1 Bytes=
          20)




SQL> SELECT ROWID, Ename, Sal, Deptno
  2  FROM Emp
  3  WHERE ROWID = 'AAANCuAAEAAAAG/AAI';

ROWID              ENAME            SAL      DEPTNO
------------------ ---------- ---------- ----------
AAANCuAAEAAAAG/AAI WARD             1250          30


Execution Plan
-----------------------------------------------------------
   0      SELECT STATEMENT Optimizer=ALL_ROWS (Cost=1 Card=1 Bytes=20)
   1    0    TABLE ACCESS (BY USER ROWID) OF 'EMP' (TABLE) (Cost=1 Card
          =1 Bytes=20)
```

```
SQL> ED
Wrote file afiedt.buf

  1  SELECT ROWID, Ename, Sal, Deptno
  2  FROM Emp
  3* WHERE ROWID < 'AAANCuAAEAAAAG/AAI'
SQL> /

ROWID               ENAME            SAL     DEPTNO
------------------  ----------  ----------  ----------
AAANCuAAEAAAAG/AAA  KING              5000          10
AAANCuAAEAAAAG/AAB  BLAKE             2850          30
AAANCuAAEAAAAG/AAC  CLARK             2450          10
AAANCuAAEAAAAG/AAD  JONES             2975          20
AAANCuAAEAAAAG/AAE  MARTIN            1250          30
AAANCuAAEAAAAG/AAF  ALLEN             1600          30
AAANCuAAEAAAAG/AAG  TURNER            1500          30
AAANCuAAEAAAAG/AAH  JAMES              950          30

8 rows selected.


Execution Plan
----------------------------------------------------------
   0      SELECT STATEMENT Optimizer=ALL_ROWS (Cost=3 Card=1 Bytes=20)
   1    0   TABLE ACCESS (FULL) OF 'EMP' (TABLE) (Cost=3 Card=1 Bytes=
          20)




SQL> ED
Wrote file afiedt.buf

  1  SELECT ROWID, Ename, Sal, Deptno
  2  FROM Emp
  3* WHERE ROWID > 'AAANCuAAEAAAAG/AAI'
SQL> /

ROWID               ENAME            SAL     DEPTNO
------------------  ----------  ----------  ----------
AAANCuAAEAAAAG/AAJ  FORD              3000          20
AAANCuAAEAAAAG/AAK  SMITH              800          20
AAANCuAAEAAAAG/AAL  SCOTT             3000          20
AAANCuAAEAAAAG/AAM  ADAMS             1100          20
AAANCuAAEAAAAG/AAN  MILLER            1300          10


Execution Plan
----------------------------------------------------------
   0      SELECT STATEMENT Optimizer=ALL_ROWS (Cost=3 Card=1 Bytes=20)
   1    0   TABLE ACCESS (FULL) OF 'EMP' (TABLE) (Cost=3 Card=1 Bytes=
          20)
```

```
SQL> cl scr

SQL> SELECT Ename, Sal, Job
  2  FROM Emp
  3  WHERE ROWID = 'AAAMoOAAEAAAAzXAAJ';
FROM Emp
    *
ERROR at line 2:
ORA-01410: invalid ROWID


SQL> cl scr

SQL> SELECT B.Sal, SUM(A.Sal) "Cum Sal"
  2  FROM Emp A, Emp B
  3  WHERE A.ROWID < = B.ROWID
  4  GROUP BY B.ROWID, B.Sal;

       SAL    Cum Sal
---------- ----------
      5000       5000
      2850       7850
      2450      10300
      2975      13275
      1250      14525
      1600      16125
      1500      17625
       950      18575
      1250      19825
      3000      22825
       800      23625

       SAL    Cum Sal
---------- ----------
      3000      26625
      1100      27725
      1300      29025

14 rows selected.


Execution Plan
----------------------------------------------------------
   0      SELECT STATEMENT Optimizer=ALL_ROWS (Cost=9 Card=10 Bytes=22
          0)

   1    0   SORT (GROUP BY) (Cost=9 Card=10 Bytes=220)
   2    1    MERGE JOIN (Cost=8 Card=10 Bytes=220)
   3    2     SORT (JOIN) (Cost=4 Card=14 Bytes=154)
   4    3      TABLE ACCESS (FULL) OF 'EMP' (TABLE) (Cost=3 Card=14
          Bytes=154)
```

```
  5    2          SORT (JOIN) (Cost=4 Card=14 Bytes=154)
  6    5            TABLE ACCESS (FULL) OF 'EMP' (TABLE) (Cost=3 Card=14
        Bytes=154)




SQL> cl scr

SQL> SELECT B.Ename, B.Sal, Sum(A.Sal) "Cum Sal"
  2  FROM Emp A, Emp B
  3  WHERE A.ROWID < = B.ROWID
  4  GROUP BY B.ROWID, B.Sal, B.Ename
  5  ORDER BY "Cum Sal"
  6  /

ENAME             SAL    Cum Sal
---------- ---------- ----------
KING             5000       5000
BLAKE            2850       7850
CLARK            2450      10300
JONES            2975      13275
MARTIN           1250      14525
ALLEN            1600      16125
TURNER           1500      17625
JAMES             950      18575
WARD             1250      19825
FORD             3000      22825
SMITH             800      23625

ENAME             SAL    Cum Sal
---------- ---------- ----------
SCOTT            3000      26625
ADAMS            1100      27725
MILLER           1300      29025

14 rows selected.


Execution Plan
----------------------------------------------------------
  0      SELECT STATEMENT Optimizer=ALL_ROWS (Cost=10 Card=10 Bytes=2
        80)

  1    0   SORT (ORDER BY) (Cost=10 Card=10 Bytes=280)
  2    1     SORT (GROUP BY) (Cost=10 Card=10 Bytes=280)
  3    2       MERGE JOIN (Cost=8 Card=10 Bytes=280)
  4    3         SORT (JOIN) (Cost=4 Card=14 Bytes=238)
  5    4           TABLE ACCESS (FULL) OF 'EMP' (TABLE) (Cost=3 Card=
        14 Bytes=238)

  6    3           SORT (JOIN) (Cost=4 Card=14 Bytes=154)
  7    6             TABLE ACCESS (FULL) OF 'EMP' (TABLE) (Cost=3 Card=
        14 Bytes=154)
```

```
SQL> ED
Wrote file afiedt.buf

  1   SELECT B.Ename, B.Sal,
  2   Sum(A.Sal) "Cum Sal",
  3   AVG(A.Sal) "Mov Avg"
  4   FROM Emp A, Emp B
  5   WHERE A.ROWID < = B.ROWID
  6   GROUP BY B.ROWID, B.Sal, B.Ename
  7* ORDER BY "Cum Sal"
SQL> /

ENAME              SAL    Cum Sal     Mov Avg
---------- ---------- ---------- ----------
KING              5000       5000        5000
BLAKE             2850       7850        3925
CLARK             2450      10300 3433.33333
JONES             2975      13275     3318.75
MARTIN            1250      14525        2905
ALLEN             1600      16125      2687.5
TURNER            1500      17625 2517.85714
JAMES              950      18575    2321.875
WARD              1250      19825 2202.77778
FORD              3000      22825      2282.5
SMITH              800      23625 2147.72727

ENAME              SAL    Cum Sal     Mov Avg
---------- ---------- ---------- ----------
SCOTT             3000      26625     2218.75
ADAMS             1100      27725 2132.69231
MILLER            1300      29025 2073.21429

14 rows selected.


Execution Plan
----------------------------------------------------------
   0       SELECT STATEMENT Optimizer=ALL_ROWS (Cost=10 Card=10 Bytes=2
           80)

   1    0   SORT (ORDER BY) (Cost=10 Card=10 Bytes=280)
   2    1     SORT (GROUP BY) (Cost=10 Card=10 Bytes=280)
   3    2      MERGE JOIN (Cost=8 Card=10 Bytes=280)
   4    3        SORT (JOIN) (Cost=4 Card=14 Bytes=238)
   5    4          TABLE ACCESS (FULL) OF 'EMP' (TABLE) (Cost=3 Card=
        14 Bytes=238)

   6    3          SORT (JOIN) (Cost=4 Card=14 Bytes=154)
   7    6            TABLE ACCESS (FULL) OF 'EMP' (TABLE) (Cost=3 Card=
        14 Bytes=154)
```

```
SQL> SPOOL OFF
SQL> cl scr

SQL> SET VERIFY OFF
SQL> cl scr

SQL> SELECT Ename, Empno, MGR
  2  FROM Emp
  3  START WITH Empno = 7839
  4  CONNECT BY PRIOR Empno = MGR;

ENAME           EMPNO        MGR
---------- ---------- ----------
KING             7839
BLAKE            7698       7839
MARTIN           7654       7698
ALLEN            7499       7698
TURNER           7844       7698
JAMES            7900       7698
WARD             7521       7698
CLARK            7782       7839
MILLER           7934       7782
JONES            7566       7839
FORD             7902       7566

ENAME           EMPNO        MGR
---------- ---------- ----------
SMITH            7369       7902
SCOTT            7788       7566
ADAMS            7876       7788

14 rows selected.

SQL> UPDATE Emp
  2  SET MGR = 7566
  3  WHERE Empno = 7839;

1 row updated.

SQL> SELECT Ename, Empno, MGR
  2  FROM Emp;

ENAME           EMPNO        MGR
---------- ---------- ----------
KING             7839       7566
BLAKE            7698       7839
CLARK            7782       7839
JONES            7566       7839
MARTIN           7654       7698
ALLEN            7499       7698
TURNER           7844       7698
JAMES            7900       7698
WARD             7521       7698
FORD             7902       7566
SMITH            7369       7902
```

```
ENAME          EMPNO        MGR
---------- ---------- ----------
SCOTT           7788       7566
ADAMS           7876       7788
MILLER          7934       7782

14 rows selected.

SQL> SELECT Ename, Empno, MGR
  2  FROM Emp
  3  START WITH Empno = 7839
  4  CONNECT BY PRIOR Empno = MGR;
ERROR:
ORA-01436: CONNECT BY loop in user data



no rows selected

SQL> ED
Wrote file afiedt.buf

  1  SELECT Ename, Empno, MGR
  2  FROM Emp
  3  START WITH Empno = 7839
  4* CONNECT BY NOCYCLE PRIOR Empno = MGR
SQL> /

ENAME          EMPNO        MGR
---------- ---------- ----------
KING            7839       7566
BLAKE           7698       7839
MARTIN          7654       7698
ALLEN           7499       7698
TURNER          7844       7698
JAMES           7900       7698
WARD            7521       7698
CLARK           7782       7839
MILLER          7934       7782
JONES           7566       7839
FORD            7902       7566

ENAME          EMPNO        MGR
---------- ---------- ----------
SMITH           7369       7902
SCOTT           7788       7566
ADAMS           7876       7788

14 rows selected.

SQL> cl scr

SQL> COLUMN SalPath FORMAT A20
SQL> SELECT Ename,
  2  CONNECT_BY_ISCYCLE "Cycle",
  3  LEVEL,
```

```
   4   SYS_CONNECT_BY_PATH(Sal, '/') "SalPath"
   5   FROM Emp
   6   START WITH Ename = 'KING'
   7   CONNECT BY NOCYCLE PRIOR Empno =  MGR;
```

ENAME	Cycle	LEVEL	SalPath
KING	0	1	/5000
BLAKE	0	2	/5000/2850
MARTIN	0	3	/5000/2850/1250
ALLEN	0	3	/5000/2850/1600
TURNER	0	3	/5000/2850/1500
JAMES	0	3	/5000/2850/950
WARD	0	3	/5000/2850/1250
CLARK	0	2	/5000/2450
MILLER	0	3	/5000/2450/1300
JONES	1	2	/5000/2975
FORD	0	3	/5000/2975/3000

ENAME	Cycle	LEVEL	SalPath
SMITH	0	4	/5000/2975/3000/800
SCOTT	0	3	/5000/2975/3000
ADAMS	0	4	/5000/2975/3000/1100

```
14 rows selected.

SQL> ED
Wrote file afiedt.buf

   1   SELECT Ename,
   2   CONNECT_BY_ISCYCLE "Cycle",
   3   LEVEL,
   4   SYS_CONNECT_BY_PATH(Sal, '/') "SalPath"
   5   FROM Emp
   6   WHERE CONNECT_BY_ISCYCLE = &GCycle
   7   START WITH Ename = 'KING'
   8*  CONNECT BY NOCYCLE PRIOR Empno =  MGR
SQL> /
Enter value for gcycle: 0
```

ENAME	Cycle	LEVEL	SalPath
KING	0	1	/5000
BLAKE	0	2	/5000/2850
MARTIN	0	3	/5000/2850/1250
ALLEN	0	3	/5000/2850/1600
TURNER	0	3	/5000/2850/1500
JAMES	0	3	/5000/2850/950
WARD	0	3	/5000/2850/1250
CLARK	0	2	/5000/2450
MILLER	0	3	/5000/2450/1300
FORD	0	3	/5000/2975/3000
SMITH	0	4	/5000/2975/3000/800

ENAME	Cycle	LEVEL	SalPath

```
---------- ---------- ---------- --------------------
SCOTT               0          3 /5000/2975/3000
ADAMS               0          4 /5000/2975/3000/1100

13 rows selected.

SQL> /
Enter value for gcycle: 1

ENAME           Cycle      LEVEL SalPath
---------- ---------- ---------- --------------------
JONES               1          2 /5000/2975

SQL> ROLLBACK;

Rollback complete.

SQL> cl scr

SQL> SELECT Ename, Empno, MGR
  2  FROM Emp
  3  START WITH Empno = 7839
  4  CONNECT BY PRIOR Empno = MGR;

ENAME           EMPNO        MGR
---------- ---------- ----------
KING             7839
BLAKE            7698       7839
MARTIN           7654       7698
ALLEN            7499       7698
TURNER           7844       7698
JAMES            7900       7698
WARD             7521       7698
CLARK            7782       7839
MILLER           7934       7782
JONES            7566       7839
FORD             7902       7566

ENAME           EMPNO        MGR
---------- ---------- ----------
SMITH            7369       7902
SCOTT            7788       7566
ADAMS            7876       7788

14 rows selected.

SQL> SELECT Ename "Employee", CONNECT_BY_ISLEAF "IsLeaf",
  2  LEVEL, SYS_CONNECT_BY_PATH(Ename, '/') "Path"
  3  FROM Emp
  4  START WITH Empno = 7839
  5  CONNECT BY PRIOR Empno = MGR;

Employee      IsLeaf       LEVEL
---------- ---------- ----------
Path
--------------------------------------------------------------------------------
```

```
KING                0           1
/KING

BLAKE               0           2
/KING/BLAKE

MARTIN              1           3
/KING/BLAKE/MARTIN


Employee      IsLeaf      LEVEL
---------- ---------- ----------
Path
--------------------------------------------------------------------------
ALLEN               1           3
/KING/BLAKE/ALLEN

TURNER              1           3
/KING/BLAKE/TURNER

JAMES               1           3
/KING/BLAKE/JAMES


Employee      IsLeaf      LEVEL
---------- ---------- ----------
Path
--------------------------------------------------------------------------
WARD                1           3
/KING/BLAKE/WARD

CLARK               0           2
/KING/CLARK

MILLER              1           3
/KING/CLARK/MILLER


Employee      IsLeaf      LEVEL
---------- ---------- ----------
Path
--------------------------------------------------------------------------
JONES               0           2
/KING/JONES

FORD                0           3
/KING/JONES/FORD

SMITH               1           4
/KING/JONES/FORD/SMITH


Employee      IsLeaf      LEVEL
---------- ---------- ----------
Path
--------------------------------------------------------------------------
```

```
SCOTT                0           3
/KING/JONES/SCOTT


ADAMS                1           4
/KING/JONES/SCOTT/ADAMS



14 rows selected.

SQL> COLUMN "Path" FORMAT A25
SQL> /

Employee        IsLeaf       LEVEL Path
---------- ---------- ---------- ------------------------
KING                 0           1 /KING
BLAKE                0           2 /KING/BLAKE
MARTIN               1           3 /KING/BLAKE/MARTIN
ALLEN                1           3 /KING/BLAKE/ALLEN
TURNER               1           3 /KING/BLAKE/TURNER
JAMES                1           3 /KING/BLAKE/JAMES
WARD                 1           3 /KING/BLAKE/WARD
CLARK                0           2 /KING/CLARK
MILLER               1           3 /KING/CLARK/MILLER
JONES                0           2 /KING/JONES
FORD                 0           3 /KING/JONES/FORD

Employee        IsLeaf       LEVEL Path
---------- ---------- ---------- ------------------------
SMITH                1           4 /KING/JONES/FORD/SMITH
SCOTT                0           3 /KING/JONES/SCOTT
ADAMS                1           4 /KING/JONES/SCOTT/ADAMS

14 rows selected.

SQL> ED
Wrote file afiedt.buf

  1   SELECT Ename "Employee", CONNECT_BY_ISLEAF "IsLeaf",
  2   LEVEL, SYS_CONNECT_BY_PATH(Ename, '/') "Path"
  3   FROM Emp
  4   WHERE CONNECT_BY_ISLEAF = &GLeaf
  5   START WITH Empno = 7839
  6*  CONNECT BY PRIOR Empno = MGR
SQL> /
Enter value for gleaf: 1

Employee        IsLeaf       LEVEL Path
---------- ---------- ---------- ------------------------
MARTIN               1           3 /KING/BLAKE/MARTIN
ALLEN                1           3 /KING/BLAKE/ALLEN
TURNER               1           3 /KING/BLAKE/TURNER
JAMES                1           3 /KING/BLAKE/JAMES
WARD                 1           3 /KING/BLAKE/WARD
MILLER               1           3 /KING/CLARK/MILLER
SMITH                1           4 /KING/JONES/FORD/SMITH
ADAMS                1           4 /KING/JONES/SCOTT/ADAMS
```

```
8 rows selected.

SQL> /
Enter value for gleaf: 0

Employee        IsLeaf        LEVEL Path
---------- ---------- ---------- -------------------------
KING                 0           1 /KING
BLAKE                0           2 /KING/BLAKE
CLARK                0           2 /KING/CLARK
JONES                0           2 /KING/JONES
FORD                 0           3 /KING/JONES/FORD
SCOTT                0           3 /KING/JONES/SCOTT

6 rows selected.

SQL> SPOOL OFF
```