```
SQL> SELECT ENAME, DEPTNO, SAL,
  2  RANK()
  3  OVER
  4  (
  5  ORDER BY SAL
  6  ) EMPRANK
  7  FROM EMP
  8  ORDER BY EMPRANK;

ENAME  DEPTNO   SAL    EMPRANK
------ ------ ----- ----------
SMITH      20   800          1
JAMES      30   950          2
ADAMS      20  1100          3
WARD       30  1250          4
MARTIN     30  1250          4
MILLER     10  1300          6
TURNER     30  1500          7
ALLEN      30  1600          8
CLARK      10  2450          9
BLAKE      30  2850         10
JONES      20  2975         11
SCOTT      20  3000         12
FORD       20  3000         12
KING       10  5000         14

14 rows selected.

SQL> SELECT ENAME, DEPTNO, SAL,
  2  DENSE_RANK()
  3  OVER
  4  (
  5  ORDER BY SAL DESC
  6  ) EMPRANK
  7  FROM EMP
  8  ORDER BY EMPRANK;

ENAME  DEPTNO   SAL    EMPRANK
------ ------ ----- ----------
KING       10  5000          1
FORD       20  3000          2
SCOTT      20  3000          2
JONES      20  2975          3
BLAKE      30  2850          4
CLARK      10  2450          5
ALLEN      30  1600          6
TURNER     30  1500          7
MILLER     10  1300          8
MARTIN     30  1250          9
WARD       30  1250          9
ADAMS      20  1100         10
JAMES      30   950         11
SMITH      20   800         12
```

```
14 rows selected.

SQL> SELECT ROWNUM, E1.*
  2  FROM
  3  (
  4  SELECT ENAME, DEPTNO, SAL,
  5  DENSE_RANK()
  6  OVER
  7  (
  8  ORDER BY SAL DESC
  9  ) EMPRANK
 10  FROM EMP
 11  ) E1
 12  ORDER BY ROWNUM;

    ROWNUM ENAME  DEPTNO   SAL    EMPRANK
---------- ------ ------ ----- ----------
         1 KING       10  5000          1
         2 FORD       20  3000          2
         3 SCOTT      20  3000          2
         4 JONES      20  2975          3
         5 BLAKE      30  2850          4
         6 CLARK      10  2450          5
         7 ALLEN      30  1600          6
         8 TURNER     30  1500          7
         9 MILLER     10  1300          8
        10 MARTIN     30  1250          9
        11 WARD       30  1250          9
        12 ADAMS      20  1100         10
        13 JAMES      30   950         11
        14 SMITH      20   800         12

14 rows selected.

SQL> SELECT
  2  DENSE_RANK()
  3  OVER
  4  (
  5  ORDER BY ENAME
  6  ) ROLLNO,
  7  ENAME, DEPTNO, SAL
  8  FROM EMP
  9  ORDER BY ROLLNO;

   ROLLNO ENAME  DEPTNO   SAL
---------- ------ ------ -----
         1 ADAMS      20  1100
         2 ALLEN      30  1600
         3 BLAKE      30  2850
         4 CLARK      10  2450
         5 FORD       20  3000
         6 JAMES      30   950
         7 JONES      20  2975
         8 KING       10  5000
```

```
         9 MARTIN     30  1250
        10 MILLER     10  1300
        11 SCOTT      20  3000
        12 SMITH      20   800
        13 TURNER     30  1500
        14 WARD       30  1250

14 rows selected.

SQL> BEGIN
  2  INSERT INTO EMP(EMPNO, ENAME, DEPTNO, SAL)
  3  VALUES(7935,'MILLER',30,1500);
  4  INSERT INTO EMP(EMPNO, ENAME, DEPTNO, SAL)
  5  VALUES(7936,'MILLER',30,1500);
  6  END;
  7  /

PL/SQL procedure successfully completed.

SQL> SELECT
  2  DENSE_RANK()
  3  OVER
  4  (
  5  ORDER BY ENAME
  6  ) ROLLNO,
  7  ENAME, DEPTNO, SAL
  8  FROM EMP
  9  ORDER BY ROLLNO;

    ROLLNO ENAME  DEPTNO   SAL
---------- ------ ------ -----
         1 ADAMS      20  1100
         2 ALLEN      30  1600
         3 BLAKE      30  2850
         4 CLARK      10  2450
         5 FORD       20  3000
         6 JAMES      30   950
         7 JONES      20  2975
         8 KING       10  5000
         9 MARTIN     30  1250
        10 MILLER     30  1500
        10 MILLER     30  1500
        10 MILLER     10  1300
        11 SCOTT      20  3000
        12 SMITH      20   800
        13 TURNER     30  1500
        14 WARD       30  1250

16 rows selected.

SQL> SELECT
  2  DENSE_RANK()
  3  OVER
  4  (
```

```
  5  ORDER BY ENAME
  6  ) ROLLNO,
  7  ENAME, DEPTNO, SAL
  8  FROM EMP
  9  ORDER BY ROLLNO;

    ROLLNO ENAME  DEPTNO   SAL
---------- ------ ------ -----
         1 ADAMS      20  1100
         2 ALLEN      30  1600
         3 BLAKE      30  2850
         4 CLARK      10  2450
         5 FORD       20  3000
         6 JAMES      30   950
         7 JONES      20  2975
         8 KING       10  5000
         9 MARTIN     30  1250
        10 MILLER     30  1500
        10 MILLER     30  1500
        10 MILLER     10  1300
        11 SCOTT      20  3000
        12 SMITH      20   800
        13 TURNER     30  1500
        14 WARD       30  1250

16 rows selected.

SQL> SELECT
  2  DENSE_RANK()
  3  OVER
  4  (
  5  ORDER BY ENAME, EMPNO
  6  ) ROLLNO,
  7  ENAME, DEPTNO, SAL
  8  FROM EMP
  9  ORDER BY ROLLNO;

    ROLLNO ENAME  DEPTNO   SAL
---------- ------ ------ -----
         1 ADAMS      20  1100
         2 ALLEN      30  1600
         3 BLAKE      30  2850
         4 CLARK      10  2450
         5 FORD       20  3000
         6 JAMES      30   950
         7 JONES      20  2975
         8 KING       10  5000
         9 MARTIN     30  1250
        10 MILLER     10  1300
        11 MILLER     30  1500
        12 MILLER     30  1500
        13 SCOTT      20  3000
        14 SMITH      20   800
        15 TURNER     30  1500
```

```
        16 WARD       30  1250

16 rows selected.

SQL> SELECT ENAME, DEPTNO, SAL,
  2  DENSE_RANK()
  3  OVER
  4  (
  5  PARTITION BY DEPTNO
  6  ORDER BY SAL DESC
  7  ) "TOP SAL"
  8  FROM EMP
  9  ORDER BY DEPTNO, SAL DESC;

ENAME  DEPTNO   SAL    TOP SAL
------ ------ ----- ----------
KING       10  5000          1
CLARK      10  2450          2
MILLER     10  1300          3
FORD       20  3000          1
SCOTT      20  3000          1
JONES      20  2975          2
ADAMS      20  1100          3
SMITH      20   800          4
BLAKE      30  2850          1
ALLEN      30  1600          2
TURNER     30  1500          3
WARD       30  1250          4
MARTIN     30  1250          4
JAMES      30   950          5

14 rows selected.

SQL> SELECT ENAME, DEPTNO, SAL,
  2  RANK()
  3  OVER
  4  (
  5  PARTITION BY DEPTNO
  6  ORDER BY SAL DESC
  7  ) "TOP DEPT SAL",
  8  RANK()
  9  OVER
 10  (
 11  ORDER BY SAL DESC
 12  ) "TOP ORG SAL"
 13  FROM EMP
 14  ORDER BY DEPTNO, SAL DESC;

ENAME  DEPTNO   SAL TOP DEPT SAL TOP ORG SAL
------ ------ ----- ------------ -----------
KING       10  5000            1           1
CLARK      10  2450            2           6
MILLER     10  1300            3           9
FORD       20  3000            1           2
```

```
SCOTT      20  3000            1            2
JONES      20  2975            3            4
ADAMS      20  1100            4           12
SMITH      20   800            5           14
BLAKE      30  2850            1            5
ALLEN      30  1600            2            7
TURNER     30  1500            3            8
WARD       30  1250            4           10
MARTIN     30  1250            4           10
JAMES      30   950            6           13

14 rows selected.

SQL> SELECT
  2  ENAME,
  3  DEPTNO,
  4  SAL,
  5  SUM(SAL)
  6  FROM EMP
  7  GROUP BY ENAME, DEPTNO,SAL;

ENAME  DEPTNO   SAL   SUM(SAL)
------ ------ ----- ----------
ALLEN      30  1600       1600
TURNER     30  1500       1500
ADAMS      20  1100       1100
FORD       20  3000       3000
SCOTT      20  3000       3000
MARTIN     30  1250       1250
CLARK      10  2450       2450
JAMES      30   950        950
SMITH      20   800        800
MILLER     10  1300       1300
WARD       30  1250       1250
KING       10  5000       5000
JONES      20  2975       2975
BLAKE      30  2850       2850

14 rows selected.

SQL> SELECT
  2  ENAME,
  3  DEPTNO,
  4  SAL,
  5  SUM(SAL)
  6  OVER
  7  (
  8  ORDER BY SAL DESC
  9  ) "RUN SAL"
 10  FROM EMP;

ENAME  DEPTNO   SAL    RUN SAL
------ ------ ----- ----------
KING       10  5000       5000
```

```
FORD       20  3000      11000
SCOTT      20  3000      11000
JONES      20  2975      13975
BLAKE      30  2850      16825
CLARK      10  2450      19275
ALLEN      30  1600      20875
TURNER     30  1500      22375
MILLER     10  1300      23675
MARTIN     30  1250      26175
WARD       30  1250      26175
ADAMS      20  1100      27275
JAMES      30   950      28225
SMITH      20   800      29025

14 rows selected.

SQL> SELECT
  2  ENAME,
  3  DEPTNO,
  4  SAL,
  5  TO_CHAR
  6  (
  7  SUM(SAL)
  8  OVER
  9  (
 10  ORDER BY SAL DESC,EMPNO
 11  ),'99G999D99'
 12  ) "RUN SUM SAL",
 13  TO_CHAR
 14  (
 15  AVG(SAL)
 16  OVER
 17  (
 18  ORDER BY SAL DESC,EMPNO
 19  ),'99G999D99'
 20  ) "MOV AVG SAL"
 21  FROM EMP;

ENAME  DEPTNO   SAL RUN SUM SA MOV AVG SA
------ ------ ----- ---------- ----------
KING       10  5000   5,000.00   5,000.00
SCOTT      20  3000   8,000.00   4,000.00
FORD       20  3000  11,000.00   3,666.67
JONES      20  2975  13,975.00   3,493.75
BLAKE      30  2850  16,825.00   3,365.00
CLARK      10  2450  19,275.00   3,212.50
ALLEN      30  1600  20,875.00   2,982.14
TURNER     30  1500  22,375.00   2,796.88
MILLER     10  1300  23,675.00   2,630.56
WARD       30  1250  24,925.00   2,492.50
MARTIN     30  1250  26,175.00   2,379.55
ADAMS      20  1100  27,275.00   2,272.92
JAMES      30   950  28,225.00   2,171.15
SMITH      20   800  29,025.00   2,073.21
```

```
14 rows selected.

SQL> SELECT
  2  ENAME,
  3  DEPTNO,
  4  SAL,
  5  TO_CHAR
  6  (
  7  SUM(SAL)
  8  OVER
  9  (
 10  PARTITION BY DEPTNO
 11  ORDER BY SAL DESC,EMPNO
 12  ),'99G999D99'
 13  ) "RUN SUM SAL",
 14  TO_CHAR
 15  (
 16  AVG(SAL)
 17  OVER
 18  (
 19  PARTITION BY DEPTNO
 20  ORDER BY SAL DESC,EMPNO
 21  ),'99G999D99'
 22  ) "MOV AVG SAL"
 23  FROM EMP;

ENAME  DEPTNO   SAL RUN SUM SA MOV AVG SA
------ ------ ----- ---------- ----------
KING       10  5000   5,000.00   5,000.00
CLARK      10  2450   7,450.00   3,725.00
MILLER     10  1300   8,750.00   2,916.67
SCOTT      20  3000   3,000.00   3,000.00
FORD       20  3000   6,000.00   3,000.00
JONES      20  2975   8,975.00   2,991.67
ADAMS      20  1100  10,075.00   2,518.75
SMITH      20   800  10,875.00   2,175.00
BLAKE      30  2850   2,850.00   2,850.00
ALLEN      30  1600   4,450.00   2,225.00
TURNER     30  1500   5,950.00   1,983.33
WARD       30  1250   7,200.00   1,800.00
MARTIN     30  1250   8,450.00   1,690.00
JAMES      30   950   9,400.00   1,566.67

14 rows selected.

SQL> SELECT ENAME,
  2  DEPTNO,
  3  SAL,
  4  RANK()
  5  OVER
  6  (
  7  ORDER BY SAL DESC
  8  ) RANKSAL
```

```
  9  FROM EMP;

ENAME  DEPTNO   SAL    RANKSAL
------ ------ ----- ----------
KING       10  5000          1
FORD       20  3000          2
SCOTT      20  3000          2
JONES      20  2975          4
BLAKE      30  2850          5
CLARK      10  2450          6
ALLEN      30  1600          7
TURNER     30  1500          8
MILLER     10  1300          9
MARTIN     30  1250         10
WARD       30  1250         10
ADAMS      20  1100         12
JAMES      30   950         13
SMITH      20   800         14

14 rows selected.

SQL> SELECT ROWNUM, E1.*
  2  FROM
  3  (
  4  SELECT ENAME, DEPTNO, SAL,
  5  DENSE_RANK()
  6  OVER
  7  (
  8  ORDER BY SAL &GIEVPREF
  9  ) EMPRANK
 10  FROM EMP
 11  ORDER BY EMPRANK
 12  ) E1
 13  WHERE E1.EMPRANK &GIVELEVEL
 14  ORDER BY ROWNUM;
Enter value for gievpref: <=5
old   8: ORDER BY SAL &GIEVPREF
new   8: ORDER BY SAL <=5
Enter value for givelevel: <=5
old  13: WHERE E1.EMPRANK &GIVELEVEL
new  13: WHERE E1.EMPRANK <=5
ORDER BY SAL <=5
             *
ERROR at line 8:
ORA-00907: missing right parenthesis


SQL> /
Enter value for gievpref: DESC
old   8: ORDER BY SAL &GIEVPREF
new   8: ORDER BY SAL DESC
Enter value for givelevel: <=5
old  13: WHERE E1.EMPRANK &GIVELEVEL
new  13: WHERE E1.EMPRANK <=5
```

```
    ROWNUM ENAME  DEPTNO   SAL    EMPRANK
---------- ------ ------ ----- ----------
         1 KING       10  5000          1
         2 SCOTT      20  3000          2
         3 FORD       20  3000          2
         4 JONES      20  2975          3
         5 BLAKE      30  2850          4
         6 CLARK      10  2450          5

6 rows selected.

SQL> /
Enter value for gievpref: ASC
old   8: ORDER BY SAL &GIEVPREF
new   8: ORDER BY SAL ASC
Enter value for givelevel: <=5
old  13: WHERE E1.EMPRANK &GIVELEVEL
new  13: WHERE E1.EMPRANK <=5

    ROWNUM ENAME  DEPTNO   SAL    EMPRANK
---------- ------ ------ ----- ----------
         1 SMITH      20   800          1
         2 JAMES      30   950          2
         3 ADAMS      20  1100          3
         4 WARD       30  1250          4
         5 MARTIN     30  1250          4
         6 MILLER     10  1300          5

6 rows selected.

SQL> /
Enter value for gievpref: DESC
old   8: ORDER BY SAL &GIEVPREF
new   8: ORDER BY SAL DESC
Enter value for givelevel: =1
old  13: WHERE E1.EMPRANK &GIVELEVEL
new  13: WHERE E1.EMPRANK =1

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

SQL> SELECT ROWNUM, E1.*
  2  FROM
  3  (
  4  SELECT ENAME, DEPTNO, HIREDATE,
  5  DENSE_RANK()
  6  OVER
  7  (
  8  ORDER BY HIREDATE
  9  ) HIRERANK
 10  FROM EMP
 11  ORDER BY HIRERANK
```

```
 12  ) E1
 13  WHERE E1.HIRERANK <=5
 14  ORDER BY ROWNUM;

    ROWNUM ENAME  DEPTNO HIREDATE    HIRERANK
---------- ------ ------ --------- ----------
         1 SMITH      20 17-DEC-80          1
         2 ALLEN      30 20-FEB-81          2
         3 WARD       30 22-FEB-81          3
         4 JONES      20 02-APR-81          4
         5 BLAKE      30 01-MAY-81          5

SQL> SELECT ROWNUM, E1.*
  2  FROM
  3  (
  4  SELECT ENAME, DEPTNO, HIREDATE,
  5  DENSE_RANK()
  6  OVER
  7  (
  8  ORDER BY HIREDATE DESC
  9  ) HIRERANK
 10  FROM EMP
 11  ORDER BY HIRERANK
 12  ) E1
 13  WHERE E1.HIRERANK <=5
 14  ORDER BY ROWNUM;

    ROWNUM ENAME  DEPTNO HIREDATE    HIRERANK
---------- ------ ------ --------- ----------
         1 ADAMS      20 23-MAY-87          1
         2 SCOTT      20 19-APR-87          2
         3 MILLER     10 23-JAN-82          3
         4 JAMES      30 03-DEC-81          4
         5 FORD       20 03-DEC-81          4
         6 KING       10 17-NOV-81          5

6 rows selected.

SQL> SELECT
  2  TO_CHAR(HIREDATE,'YYYY') "YEAR",
  3  SUM(SAL),
  4  DENSE_RANK()
  5  OVER
  6  (
  7  ORDER BY SUM(SAL) DESC
  8  ) YEARRANK
  9  FROM EMP
 10  GROUP BY TO_CHAR(HIREDATE,'YYYY')
 11  ORDER BY YEARRANK;

YEAR   SUM(SAL)   YEARRANK
---- ---------- ----------
1981      22825          1
1987       4100          2
```

```
1982       1300          3
1980        800          4

SQL> SELECT
  2  TO_CHAR(HIREDATE,'YYYY') "YEAR",
  3  SUM(SAL),
  4  SUM(SUM(SAL))
  5  OVER
  6  (
  7  ORDER BY SUM(SAL)
  8  ) CUMSAL,
  9  DENSE_RANK()
 10  OVER
 11  (
 12  ORDER BY SUM(SAL) DESC
 13  ) YEARRANK
 14  FROM EMP
 15  GROUP BY TO_CHAR(HIREDATE,'YYYY')
 16  ORDER BY YEARRANK;

YEAR   SUM(SAL)     CUMSAL   YEARRANK
---- ---------- ---------- ----------
1981      22825      29025          1
1987       4100       6200          2
1982       1300       2100          3
1980        800        800          4

SQL> SELECT
  2  ENAME,
  3  DEPTNO,
  4  SAL,
  5  SUM(SAL)
  6  OVER
  7  (
  8  ORDER BY SAL DESC, EMPNO
  9  ) RUNSAL
 10  FROM EMP;

ENAME  DEPTNO    SAL     RUNSAL
------ ------ ----- ----------
KING       10  5000       5000
SCOTT      20  3000       8000
FORD       20  3000      11000
JONES      20  2975      13975
BLAKE      30  2850      16825
CLARK      10  2450      19275
ALLEN      30  1600      20875
TURNER     30  1500      22375
MILLER     10  1300      23675
WARD       30  1250      24925
MARTIN     30  1250      26175
ADAMS      20  1100      27275
JAMES      30   950      28225
SMITH      20   800      29025
```

```
14 rows selected.

SQL> SELECT
  2  DEPTNO,
  3  ENAME,
  4  SAL,
  5  SUM(SAL)
  6  OVER
  7  (
  8  PARTITION BY DEPTNO  --PARTITION BY CLAUSE
  9  ORDER BY SAL DESC, EMPNO --ORDER BY CLAUSE
 10  ROWS 2 PRECEDING --WINDOW CLAUSE
 11  ) "Sliding Total"
 12  FROM EMP;

DEPTNO ENAME      SAL Sliding Total
------ ------ ----- -------------
    10 KING    5000          5000
    10 CLARK   2450          7450
    10 MILLER  1300          8750
    20 SCOTT   3000          3000
    20 FORD    3000          6000
    20 JONES   2975          8975
    20 ADAMS   1100          7075
    20 SMITH    800          4875
    30 BLAKE   2850          2850
    30 ALLEN   1600          4450
    30 TURNER  1500          5950
    30 WARD    1250          4350
    30 MARTIN  1250          4000
    30 JAMES    950          3450

14 rows selected.

SQL> SPOOL OFF
```