CHAPTER 4

GROUP functions and Grouping

We have 5 GROUP functions,

1) Sum
2) Max
3) Min
4) Avg
5) Count

Sum – returns total value

Max – returns maximum value Min – returns minimum value Avg – returns average value Count – returns number of records

Ex – 1) display the maximum salary, minimum salary and total salary from employee

```
SQL> select max(sal), min(sal), sum(sal) from emp;

  MAX(SAL)   MIN(SAL)   SUM(SAL)
---------- ---------- ----------
      5000        800      29025
```

To give aliases for the columns :-

```
SQL> select max(sal) "high",
  2  min(sal) "low",
  3  sum(sal) "total"
  4  from emp ;

      high        low      total
---------- ---------- ----------
      5000        800      29025
```

3) The below query gives the total number of employees

```
SQL> select count(*), count(empno)
  2  from emp ;

  COUNT(*) COUNT(EMPNO)
---------- ------------
        14           14
```

4) The below query gives the number of employees who have commission

```
SQL> select count(*), count(comm)
  2  from emp ;

  COUNT(*) COUNT(COMM)
---------- ------------
        14            4
```

null won't be counted

5) List the number of employees in department 30

```
SQL> select count(*) from emp
  2  where deptno = 30 ;

  COUNT(*)
----------
         6
```

ASSIGMENT

1) Display the total salary in department 30

```
SQL> select sum(sal) "total" from emp
  2  where deptno = 30;

     total
----------
      9400
```

2) List the number of clerks in department 20

```
SQL> select count(*) from emp
  2  where deptno = 20
  3  and job = 'CLERK' ;

  COUNT(*)
----------
         2
```

3) List the highest and lowest salary earned by salesmen

```
SQL> select max(sal), min(sal) from emp
  2  where job = 'SALESMAN';

  MAX(SAL)   MIN(SAL)
---------- ----------
      1600       1250
```

GROUPING

It is the process of computing the aggregates by segregating based on one or more columns. Grouping is done by using **„group by"** clause.

For ex – 1) Display the total salary of all departments

```
SQL> select deptno, sum(sal)
  2  from emp
  3  group by deptno ;

    DEPTNO   SUM(SAL)
---------- ----------
        30       9400
        20      10875
        10       8750
```

2) Display the maximum of each job

```
SQL> select job, max(sal)
  2  from emp
  3  group by job ;

JOB         MAX(SAL)
--------- ----------
CLERK           1300
SALESMAN        1600
PRESIDENT       5000
MANAGER         2975
ANALYST         3000
```

HAVING

„Having" is used to filter the grouped data.
„Where" is used to filter the non grouped data.

„Having" should be used after group by clause
„Where" should be used before group by clause

For ex – 1) Display job-wise highest salary only if the highest salary is more than Rs1500

```
SQL> select job, max(sal)
  2  from emp
  3  group by job
  4  having max(sal) > 1500 ;

JOB         MAX(SAL)
--------- ----------
SALESMAN        1600
PRESIDENT       5000
MANAGER         2975
ANALYST         3000
```

2) Display job-wise highest salary only if the highest salary is more than 1500 excluding department 30. Sort the data based on highest salary in the ascending order.

```
SQL> select job, max(sal)
  2  from emp
  3  where deptno <>30
  4  group by job
  5  having max(sal) >1500
  6  order by 2 ;

JOB         MAX(SAL)
--------- ----------
MANAGER          2975
ANALYST          3000
PRESIDENT        5000
```

RESTRICTIONS ON GROUPING

- we can select only the columns that are part of „**group by**" statement If we try selecting other columns, we will get an error as shown below,

```
SQL> select deptno, job, sum(sal), sum(comm)
  2  from emp
  3  group by deptno ;
select deptno, job, sum(sal), sum(comm)
               *
ERROR at line 1:
ORA-00979: not a GROUP BY expression
```

The above query is an error because „job" is there in the select query but not in the group by query. If it is enclosed in any of the group functions like sum(sal) etc – then it is not an error. But whatever table is included in the select query must also be included in the group by query.

The above problem can be overcome with the following query as shown below,

```
SQL>  select deptno, job, sum(sal), sum(comm)
  2   from emp
  3   group by deptno, job ;

    DEPTNO JOB         SUM(SAL)  SUM(COMM)
---------- --------- ---------- ----------
        20 CLERK            1900
        30 SALESMAN         5600       2200
        20 MANAGER          2975
        30 CLERK             950
        10 PRESIDENT        5000
        30 MANAGER          2850
        10 CLERK            1300
        10 MANAGER          2450
        20 ANALYST          6000

9 rows selected.
```

The below query is also correct to rectify the above error,

```
  1  select deptno, sum(sal), sum(comm)
  2  from emp
  3  group by deptno, job
  4* order by deptno
SQL> /

    DEPTNO   SUM(SAL)  SUM(COMM)
---------- ---------- ----------
        10       1300
        10       2450
        10       5000
        20       6000
        20       1900
        20       2975
        30        950
        30       2850
        30       5600       2200

9 rows selected.
```

Whatever is there in the select statement must be there in the group by statement. But, whatever is there in the group by statement need not be present in the select statement. This is shown in the above two corrected queries.

ASSIGNMENT

1) Display the department numbers along with the number of employees in it

```
SQL> select deptno, count(*)
  2  from emp
  3  group by deptno
  4  order by deptno ;

    DEPTNO   COUNT(*)
---------- ----------
        10          3
        20          5
        30          6
```

2) Display the department numbers which are having more than 4 employees in them

```
SQL> select deptno from emp
  2  group by deptno
  3  having count(*) >4
  4  order by deptno ;

    DEPTNO
----------
        20
        30
```

3) Display the maximum salary for each of the job excluding all the employees whose name ends with **„S"**

```
SQL>  select ename, job, min(sal)
  2   from emp
  3   where ename not like '%S'
  4   group by ename, job
  5  order by 3 ;
```

ENAME	JOB	MIN(SAL)
SMITH	CLERK	800
MARTIN	SALESMAN	1250
WARD	SALESMAN	1250
MILLER	CLERK	1300
TURNER	SALESMAN	1500
ALLEN	SALESMAN	1600
CLARK	MANAGER	2450
BLAKE	MANAGER	2850
FORD	ANALYST	3000
SCOTT	ANALYST	3000
KING	PRESIDENT	5000

11 rows selected.

4) Display the department numbers which are having more than 9000 as their departmental total salary

```
SQL>  select deptno, sum(sal)
  2   from emp
  3   group by deptno
  4   having sum(sal) >9000
  5  order by 1 ;
```

DEPTNO	SUM(SAL)
20	10875
30	9400

NOTE :

To clear the screen, the command used is,
cl scr ;

if it is a large query and we cannot type it repeatedly, then type in – SQL > ed ;
when we type ed ; - we get the notepad – after making the necessary changes – then click on the **„x"** i.e, the close button at the top right corner – then click on yes when a dialog box asking whether to overwrite the file comes – after this it comes to the oracle screen – in the next line , enter „/ „ and hit on enter button – another way of ending the query is by typing „ / „ in the next line of the query – this indicates the end of the query.