Database

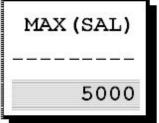


Aggregation (grouping) functions

EMP

SAL
0.0000000000000000000000000000000000000
2450
5000
1300
800
1100
3000
3000
2975
1600
2850
1250
950
1500
1250

"maximum salary in the EMP table"



Types

Function	Description
AVG([DISTINCT <u>ALL</u>]n)	Average value of n, ignoring null values
COUNT({* DISTINCT <u>ALL</u> expr})	Number of rows, where <i>expr</i> evaluates to something other than null (Count all selected rows using *, including duplicates and rows with nulls.)
MAX([DISTINCT <u>ALL</u>]expr)	Maximum value of expr, ignoring null values
MIN([DISTINCT <u>ALL</u>]expr)	Minimum value of expr, ignoring null values
STDDEV([DISTINCT ALL]x)	Standard deviation of n, ignoring null values
SUM([DISTINCT <u>ALL</u>]n)	Sum values of n, ignoring null values
VARIANCE([DISTINCT ALL]x)	Variance of n, ignoring null values

Using grouping function

```
SELECT [column,] group_function(column)

FROM table

[WHERE condition]

[GROUP BY column]

[ORDER BY column];
```

```
SQL> SELECT AVG(sal), MAX(sal),
2 MIN(sal), SUM(sal)
3 FROM emp
4 WHERE job LIKE 'SALES%';
```

AVG (SAL)	MAX (SAL)	MIN(SAL)	SUM (SAL)
1400	1600	1250	5600

Data Type

Max and Min can be used with any data type

```
SQL> SELECT MIN(hiredate), MAX(hiredate)
2 FROM emp;
```

Data Type

```
SQL> SELECT MIN(ename), MAX(ename)
2 FROM emp;

MIN(ENAME) MAX(ENAME)
-----ADAMS WARD
```

 Sum, Avg, STDDEV, Variance can be used with numeric values only.

Count

□ Count(*) returns number of rows retrieved by the

query.

```
SQL> SELECT COUNT(*)
2 FROM emp
3 WHERE deptno = 30;
```

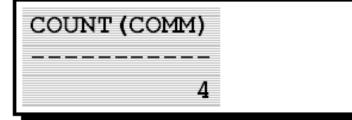
COUNT(*)	
6	

ID	deptno	comm	
1	30	10	
2	30		
3	30	10	
4	30	10	
5	30		
6	30	20	
7	20		
8	10		
9	10	20	
10	20		
11	10	10	
12	10		
13	10	20	
14	20		

Count(expr)

□ Count(expr) returns number of non null rows

SQL>	SELECT	COUNT (comm)
2	FROM	emp
3	WHERE	deptno = 30;



		_	
ID	deptno	comm	
1	30	10	
2	30		
3	30	10	
4	30	10	
5	30		
6	30	20	
7	20		
8	10		
9	10	20	
10	20		
11	10	10	
12	10		
13	10	20	
14	20		

Display the number of departments in the EMP table.

Display the number of distinct departments in the EMP table.

```
SQL> SELECT COUNT(DISTINCT (deptno))
2 FROM emp;
```

ID	deptno	comm	
1	30	10	
2	30		
3	30	10	
4	30	10	
5	30		
6	30	20	
7	20		
8	10		
9	10	20	
10	20		
11	10	10	
12	10		
13	10	20	
14	20		

COUNT (DISTINCT (DEPTNO))

Data Groups

EMP

DEPTNO	SAL
10	2450
10	5000
10	1300
20	800
20	1100
20	3000
20	3000
20	2975
30	1600
30	2850
30	1250
30	950
30	1500
30	1250

2916.6667

"average salary in EMP table for each department"

DEPTNO	AVG (SAL)
10	2916.6667
20	2175
30	1566.6667

1566.6667

The use of group by

```
SELECT column, group_function(column)

FROM table
[WHERE condition]

[GROUP BY group_by_expression]

[ORDER BY column];
```

```
SQL> SELECT deptno, AVG(sal)
2 FROM emp
3 GROUP BY deptno;
```

```
DEPTNO AVG(SAL)
------
10 2916.6667
20 2175
30 1566.6667
```

```
SQL> SELECT AVG(sal)
2 FROM emp
3 GROUP BY deptno;
```

```
AVG(SAL)
-----
2916.6667
2175
1566.6667
```

```
SQL> SELECT deptno, job, sum(sal)
```

2 FROM emp

3 GROUP BY deptno, job;

DEPTNO JOB	SUM (SAL)
10 CLERK	1300
10 MANAGER	2450
10 PRESIDENT	5000
20 ANALYST	6000
20 CLERK	1900
9 rows selected.	

deptno	JOB	SAL
10	CLERK	650
10	CLERK	650
10	MANAGER	816
10	MANAGER	816
10	MANAGER	818
10	PRESIDENT	5000
20	ANALYST	2000
20	ANALYST	2000
20	ANALYST	2000
20	CLERK	1900
		and the same

Having

```
SQL> SELECT deptno, max(sal)
2 FROM emp
3 GROUP BY deptno
4 HAVING max(sal)>2900;
```

DEPTNO	MAX (SAL)
10	5000
20	3000

Summary

```
SELECT column, group_function(column)

FROM table

[WHERE condition]

[GROUP BY group_by_expression]

[HAVING group_condition]

[ORDER BY column];
```