To sort the data in ascending or descending order use order by clause

----to arrange the data in the sorted order of sal

Select * from emp

Order by sal;

----to arrange the data in the descending order of sal

Select * from emp

Order by sal desc;

----to arrange the data in the sorted order of sal, if sal is same then arrange based on name

Select * from emp

Order by sal desc,name desc;

------to find topmost 2 rows then use limit

Select * from emp

Order by sal desc

Limit 2;

----to find 4 and 5 row in the employee table

Select * from emp

  ->

  -> Order by sal desc

  -> Limit 3,2;

Group by and having clause

Empno	Ename	Sal	Mgr	Deptno	job
1	xxxx	5678	2	10	CLERK
2	yyyy	6666	3	10	Manager
3	zzzzz	7777	2	20	CLERK
4	ppp	8888	3	10	Manager
5	ccc	4545	2	20	Manager

In database builtin functions are of 2 types

1. Aggregate function
    a. The functions which use values of many row to calculate result are called as aggregate functions
2. Single row function
    a. The functions which use value of a single row to calculate result are called as single row functions

Sum(sal)	To sum of salary column
Avg(sal)	Avg of salary column
Count(*) or count(comm)	Count number of rows if * is used inside bracket, if you specify column name, the it will ignore the null values and count only not null values
Min(sal)	To find minimum salary
Max(sal)	To find maximum salary

If you want to break the table into groups, then use group by clause.

1. In select statement you can use only columns which are there in group by clause along with aggregate functions
2. Any aggregate function o/p can be used in order by clause.
3. Inside aggregate functions we may use expressions.
4. If the condition is based on existing column, then use the condition in where clause, but if the condition Is dependent on aggregate function, then use having clause

-----to find sum,avg,min,max for salary for each department

Select deptno ,sum(sal),avg(sal),min(sal),max(sal),count(*)

From emp

Group by deptno;

-----to find sum,avg,min,max for salary for each department and for each job

select deptno,job,sum(sal),max(sal),min(sal),count(*),count(comm),avg(sal)

  -> from emp

  -> group by deptno,job

  -> order by deptno;

-----to find sum,avg,min,max for salary for each department and for each job, arrange it on sum(sal)

select deptno,job,sum(sal),max(sal),min(sal),count(*),count(comm),avg(sal)

  -> from emp

  -> group by deptno,job

  -> order by deptno

----to find sum of sal for all employees for each job

Select job,sum(sal)

From emp

Group by job;

---find sum of salary for deptno 10

Select depno,sum(sal)

From emp

Where deptno=10;

-------find sum of salary and count of CLERK in each dept

Select deptno,sum(sal),count(*)

From emp

Where job='CLERK'

Group by deptno;

-----find how many analysts are in dept 10

Select count(*)

From emp

Where job='ANALYST' and deptno=10

-----find how many analysts are in each dept

Select deptno,count(*)

From emp

Where job='ANALYST'

Group by deptno;

----display only departments which has 2 or more analyst

Select deptno,count(*)

From emp

Where job='ANALYST'

Group by depno

Having count(*)>2;

------find sum, avg of salary for employees working under each mgr, display only mgrs, if the avg(sal) >2500

Select mgr,sum(sal),avg(sal)

From emp

Group by mgr

Having avg(sal)>250

Single row functions

1. Single row functions works on numbers, strings and date data type

Abs(value)	Convert the value to +ve value	
Sqrt(value)	It will display squqre root of the given number	
Round(value,precision)	It will round the number up to given precision	Round(2345.567,2) 2345.57 Round(2345.563,2) 2345.56
Truncate(value,precision)	It will truncate the number up to given precision	truncate(2345.567,2) 2345.56 Truncate(2345.563,2) 2345.56
Ceil(value)	It will remove the fraction portion of the number and gives the next number	Ceil(234.456)=235 Ceil(234.856)=235
Floor(value)	It will remove the fraction portion of the number and gives the same number	floor(234.456)=234 floor(234.856)=234
mod(num1,num2)	It displays the remainder of the division	mod(30,7)=2

String related functions

upper	Convert data into uppercase
lower	Convert data into lower case
Concat(val1,val2,val3)	It will concatenate all the strings to generate single string
Substr(str,start,length)	It will retrieve the portion of the string starting from start value ,length number of characters
Instr(str,substr)	It will find the position of the first occurrence of the given substr, if found it will give the position, otherwise return 0
Trim(str)	It will remove all leading and trailing spaces
rtrim(str)	It will remove all trailing spaces
ltrim(str)	It will remove all leading spaces
Lpad(str,length,character)	It will add required number of characters on the left side of the string so that total length will be = given length

rpad(str,length,character)	It will add required number of characters on the right side of the string so that total length will be = given length
Length(str)	It will print number of characters in the given string

----generate email <ename>.<job>@mycompany.com

Select ename,job,concat(ename,'.',job,'@mycompany.com') email

From emp;

----generate email <ename>.<job 2nd ,3rd and 4th character>@mycompany.com

Select ename,job,concat(ename,'.',substr(job,2,3),'@mycompany.com') email

   -> from emp;

-------display name and job code for every employee, job code is 1 st , 3 characters of

job followed by first 2 digits of empno

select ename,job,concat(substr(job,1,3),substr(empno,1,2)) jobcode

from emp;

---find all employees which has 'age' in job

Select ename,job,instr(job,'age')

From emp

Where instr(job,'age')>0

Using instr is useful when you need to search data which has large size of descriptions available

---display data as follows

Ename----$\rightarrow$ job

Concat(Rpad(ename,15,'-'),'>',job)