

### ① NVL :-

NVL(arg1, arg2)

- 1) If value of argument 1 is null then it returns value of argument 2.

NVL means null value.

eg.

Display salary of employee (sal + comm) if employees are not earning commission give commission rs.100  
 > select ename, sal, comm, sal+nvl(comm, 100) from emp;

### ② NVL2 :-

Syntax:- nvl2(arg1, arg2, arg3)

null  
not null

- If value of arg1 is null then it returns value of arg3.
- If value of argument1 is not null then it returns value of arg2

eg.

Display total sal of employee & give commission rs 100 to all employee.

> select ename, sal, comm, sal+nvl2(comm, comm+100, 100)  
 from emp;

### ③ Decode :- It act as a if else statement.

eg.

- 1) Increment salary of CLERK by rs 50, Increment salary of all SALESMAN by rs 100 & remaining all employees salary should be incremented by 10.

> select ename, job, sal, decode(job, 'CLERK', sal+50, 'SALESMAN', sal+100, sal+10) from emp;

2) Select ename, job, decode(job, 'CLERK', sal+50,  
 $\underbrace{\text{sal}+10}$ ) from emp;  
 If statement part  
 else part

3) If job is CLERK return CC & if job is SALESMAN  
 return SS.

> select ename, job, decode(job, 'CLERK', 'CC',  
 'SALESMAN', 'SS') from emp;

4) Select ename, job, decode(job, 'CLERK', sal+nvl  
 $\text{comm}$ , 0) from emp;

### \* Conversion Function -

#### ① to-number :-

eg. select to-number('123') from dual;  
 Providing number in string format

⇒ to-number

123 ← in integer format

② to-date :- if date in 12-02-21 format then give  
 the date format you want.

eg. 'mm-dd-yy'

If date in 12-MAR-2021 then it will print as  
 it is no any format given by user.

eg.

1) Select to-date ('12-02-21', 'mm-dd-yy') from dual;  
 mm dd yy

2) Select to-date ('02-MAR-21') from dual;

③ to-char:-

1> Select to-char (sysdate, 'dd-month-year') from dual;

OP  $\Rightarrow$  20 - march - twenty twenty one

2> Select to-char (to\_date ('01-FEB-21'), 'dd.spth-mon-year')  
from dual;

OP  $\Rightarrow$  First - FEB - twenty twenty-one.

D - Day of week

w - week of month

DD - Day of month

WW - week of year

DDD - Day of year

DD  $\rightarrow$  print 2digit of date (20)

MM  $\rightarrow$  print 2digit of month (03)

YY  $\rightarrow$  print 2digit of year (21)

YYYY  $\rightarrow$  4 digit of year (2021)

Fm  $\rightarrow$  Filter (0) zero remove unwanted zero

th  $\rightarrow$  It is used for third, nd, st

DDSP  $\rightarrow$  Spellout date (suppose DD = 20 then DDSP = twenty)

Mon  $\rightarrow$  Abbreviated name of month (eg - FEB, MAR etc)

Year  $\rightarrow$  year spell out

(suppose yyyy = 2021, twenty twenty-one)

Month  $\rightarrow$  Name of month

(suppose Mon = MAR month = March)

Day - name of day (suppose 20 - Saturday)

Dy - Abbreviated name of day (20 - Sat)

3) to print 9th of sep

> Select to-char (to-date ('09-sep-21'), 'ddth, "of", mon')  
from dual;

> Select to-char (to-date ('09-oct-21'), 'dd-mm-yy'),  
( 'ddth "of" mon') from dual;

e.g. convert number into character

4) Select to-char (sal, '\$999.99') from emp;

⇒ \$ 800.00

\$ 1600.00

\$ 1250.00

5) Select to-char (sal, '\$999.99') from emp;

⇒ \$ 800.00

we can provide 3 digit number but in sal

# #####

only 800.00 is a one 3 digit number other  
are greater than 3 digit so their print the #.

6) Select to-char (sysdate, 'ts') from dual;

~~22/10/21~~ \* Date Function it to move between date & time

- Sysdate

- Arithmetic with sysdate

- Systimestamp

- Add-months

- Months-between

- Next-day

- Last-day.

1) Sysdate : It returns current system date.

eg. select sysdate from dual;  
 > 22-MAR-21

2) Arithmetic with Sysdate:

eg. select sysdate + 365 from dual;  
 > 22-MAR-22

3) Systimestamp :- It returns current system date & time in milliseconds also time zone

eg. select systimestamp from dual;

4) Add-months :- It returns a date after adding or substrating number of months.

eg: 1) select add-months(sysdate, 2) from dual;

> 22-MAY-21

2) select add-months('21-MAR-21', -2) from dual;

> 21-JAN-21

3) select add-months(sysdate, -2) from dual;

> 22-JAN-21

4) select add-months('21-MAR-2021', 2) from dual;

> 21-MAY-21

5) Months-Between :- It returns number of months between two given dates.

eg. months between '22-Mar-20' and '22-Mar-21'

1) select month-between(sysdate, '22-MAR-2020') from dual;

op => 12 month (1 year) between 2020 & 2021

2) select month-between('22-MAR-22', sysdate) from dual;

op => 12 month (1 year) between 2022 & 2023

3) select months-between('22-Mar-21', '22-Mar-22') from dual;

op => -12 month (1 year) between 2021 & 2022

op => -12

⑥ next-day :- It returns next day on upcoming day.

1) select next-day (sysdate, 'mon') from dual;

→ 29 - MAR - 21

2) select next-day (sysdate, 'sat') from dual;

→ 27 - MAR - 21

⑦ Last-Day : It returns last date of given month

1) select last-day (sysdate) from dual;

op → 31 - MAR - 21

2) select last-day ('21-FEB-2020') from dual;

op → 29 - FEB - 2020

#### \* General Function :- Functions of database

4) nullif :- It returns null if both parameters are same.

e.g. 1) select nullif ('Mon', 'Mon') from dual;

→ null

2) select nullif ('Mon', 'Tues') from dual;

→ Mon      <sup># arg point</sup>

5) Coalesce :- It is similar to NVL but it accepts any number of parameters (at least 2) & it will return 1<sup>st</sup> of them if it is not null.

- If it is null then it return second parameter

- If all of them are null then it returns null.

e.g. 1) select coalesce (null, 'A') from dual;

→ A

2) select coalesce ('A', null) from dual;

→ A

3) Select coalesce (null, null, 'A') from dual;

→ A

- 4) select coalesce (null, 'A', 'B') from dual;
- 5) select coalesce (null, null, null, 'A', 'B') from dual;  
    > A
- 6) Select coalesce ('A', null, 'B') from dual;  
    > A
- 7) Select coalesce (null, null, null) from dual;  
    > null.

# Queries

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Date:

Use Functions Only

- 1) List employees whose name having 4 characters (without like).

⇒ Select ename from emp where length(ename)=4;

- 2) List employees whose job is having 7 characters

⇒ Select ename, job from emp where length(job)=7;

- 3) Find out how many times letter 's' occurs in 'Qspiders'.

⇒ Select length('Qspiders') - Length(Replace('Qspiders', 's')) from dual;

- 4) List the employees whose job is having last 3 characters as 'man'.

⇒ Select job from emp where substr(job, -3) = 'MAN';

- 5) List employees whose job is having first 3 char as 'man'.

⇒ Select job from emp where substr(job, 1, 3) = 'MAN';

- 6) Display all the names whose name is having exactly 1 'L' (without like)

⇒ Select ename from emp where length(ename) - length(Replace(ename, 'L')) = 1 ;

⇒ Select ename from emp where instr(ename, 'L', 1, 1) > 0 and instr(ename, 'L', 1, 2) = 0;

7) Display dept names which are having letter 'O'.

⇒ Select dname from dept where instr(dname, 'O', 1) > 0;

8) Display the output as shown below,

Scott working as a clerk earns 3000 in dept 20.

⇒ Select concat(ename, concat('working as a', concat ('clerk  
earns 3000 In deptno', deptno))) form emp where  
ename = 'scott';

9) Calculate number of L in string 'HELLLLL'

⇒ Select length (HELLLLL)-length (Replace (HELLLLL, 'L'))  
from dual;

10) Display all the employees whose job has a string  
'MAN' (without like)

⇒ Select job from emp where instr (job, 'MAN', 1)>0;

11) Display all the employees whose job starts with  
string 'MAN' (without like)

⇒ Select job from emp where substr (job, 1, 3)='MAN';

12) Display all the employees whose job ends with  
string 'MAN' (without like)

⇒ Select job from emp where substr (job, -3) = 'MAN';

13) Display first 3 characters of ename in lowercase &  
rest everything in uppercase. If ename is 'QSPIDERS'  
then display this as 'qSPIDERS'

⇒ Select concat (lower (substr ('QSPIDERS', 1, 3)), substr  
( 'QSPIDERS', 4)) from dual;

14) Display the result from emp table as below:

SMITH is a CLERK and gets salary 2000.

Here SMITH is ename column, CLERK is job and 2000 is SAL column and rest everything is literal strings.

⇒ Select concat(ename, concat('is a', concat(job, concat('and gets a salary of', 2000)))) from emp where ename = "Smith" and job = 'CLERK';

15) List the employees hired on a wednesday

⇒ Select ename, hiredate from emp where to\_char(hiredate, 'DY') = 'WED';

16) List the employees hired on a sunday in the month of may.

⇒ Select ename, hiredate from emp where to\_char(hiredate, 'DY') = 'SUN' and to\_char(hiredate, 'MON') = 'MAY';

17) Display first half of name in lower and rest in reverse.

⇒ Select concat(lower(substr(ename, 1, length(ename)/2)), reverse(substr(ename, length(ename)/2+1))) from emp;

18) GADTD last 3 char of emp who are working as manager

⇒ Select substr(ename, -3) from emp where job = 'MANAGER';

19) GADTD name of emp if name starts with vowel (without like)

⇒ Select ename from emp where substr(ename, 1, 1)

in ('A', 'E', 'I', 'O', 'U')

20) GIAQTD 1<sup>st</sup> half of emp name

⇒ Select ename , substr(ename,1,length(ename)/2) from emp;

21) GIAQTD 2<sup>nd</sup> half of emp name.

⇒ Select ename , substr(ename,1,length(ename)/2+1) from emp;

22) GIAQTD name of emp without 1<sup>st</sup> and last char.

⇒ Select ename , substr(ename,2,length(ename)-2) from emp;

23) GIAQTD name of the emp with char 'A' in name

⇒ Select ename from emp where instr(ename,'A',1,1)>0;

## Subquery

- 1) Display all the employees whose department name ending 'S'.  
 ⇒ Select ename from emp where deptno in (select deptno from dept where dname like '%.S');
- 2) Query to display the emp names who is having maximum salary in dept name 'Accounting'.  
 ⇒ Select \* from emp where sal = (select max(sal) from emp where deptno = (select deptno from dept where dname = 'Accounting'));
- 3) Query to display the dept name who is having highest commission.  
 ⇒ select dname from dept where deptno = (select deptno from emp where comm = (select max(comm) from emp));
- 4) Query to display the employee names whose dept name has 2nd char as 'O'.  
 (No answer provided)
- 5) Query to display all the emp's who's dept no is same as scott.  
 ⇒ Select \* from emp where deptno = (select deptno from emp where ename = 'SCOTT');
- 6) Query to display all the employees in 'Operations & Accounting' dept.  
 ⇒ Select ename, deptno, from emp where deptno in (select deptno from dept where dname in ('Accounting', 'Operations'));

- 7) List the employees who has salary greater than miller  
 ⇒ Select \* from emp where sal > (select sal from emp where ename = 'MILLER');
- 8) Display the dname of employees who has no reporting man.
- 9) List all the employees who are reporting to jones manager.  
 ⇒ Select \* from emp where empno = (select mgr from emp where ename = 'Jones');
- 10) Display dname of emp whose name does not starts with 'S' and sal between 1500 and 3000  
 ⇒ Select dname from dept where deptno in (select deptno from emp where ename not like 'S%' and sal between 1500 and 3000);
- 11) Display location of emp whose sal is min but sal > 2000  
 ⇒ Select loc from dept where deptno = (select deptno from emp where sal in (select min(sal) from emp where sal > 2000));
- 12) Display the location of an employee in accounting dept.  
 ⇒ Select loc from dept where deptno in (select deptno from dept where dname = 'Accounting Department');
- 13) WAQTD all the employee whose job not same as ALLEN and salary is greater than MARTIN.  
 ⇒ Select ename, job, sal from emp where job != (select job from emp where ename = 'ALLEN') and sal > (select sal from emp where ename = 'MARTIN');

14) Display all the employees who is having location is same as ADAM's manager?

⇒ Select ename/\* from emp where deptno = (

Select deptno from dept where loc = (

Select loc from dept where deptno = (

Select deptno from emp where empno = (

Select mgr from emp where ename = 'ADAMS')));

15) Display the job, manager, number of employees who is working for jones?

⇒ Select job, mgr from emp where mgr = (

Select empno from emp where ename = 'JONES');

16) Display the employee names, hired date, commission of ford's manager?

⇒ Select empno, hiredate, comm /\* from emp where empno = ( Select mgr from emp where ename = 'FORD');

17) Display the number of employees who are getting salary less than the blake's manager.

⇒ Select count(\*) from emp where sal < (

Select sal from emp where mgr = (

Select mgr from emp where ename = 'BLAKE'));

18) List employees who located in CHICAGO and their commision is zero.

⇒ Select ename from emp where comm in 0 and deptno in (Select deptno from dept where loc = 'CHICAGO');

19) List employees who work for sales department and their salary greater than average salary of their department.

→ Select ename from emp where deptno in (select deptno from dept where dname = 'SALES') and sal > (select avg(sal) from emp where deptno in (select deptno from dept where dname = 'SALES')) ;

20) List employees who are working in research dept and they are manager.

→ Select ename from emp where Job = 'Manager' and deptno in (select deptno from dept where dname = 'Research') ;

21) Display dept. name of the employees who earn commission.

→ Select dname from dept where deptno in (select deptno from emp where comm is not null) ;

Select dname from dept where deptno in (select deptno from emp where comm != null) ;

22) Display department name of the employee who earn maximum salary and have no reporting manager.

→ Select dname from dept where deptno in (Select deptno from emp where sal = (select max(sal) from emp where mgr is null));

23) Display employee details who are reporting to blake and have commission without using null or not null .

→ Select \* from emp where mgr in (select empno from emp where ename = 'BLAKE') and comm >= 0 ;

24) list all the deptname and loc of all the salesman manager's manager.

⇒ Select cname, loc from dept where deptno = (

Select deptno from emp where empno = (

Select mgr from emp where empno in (

Select mgr from emp where job = 'SALESMAN'));

25) Display 2<sup>nd</sup> max sal.

⇒ Select max(sal) from emp where sal < (select max(sal) from emp);

26) Display 2<sup>nd</sup> min sal.

⇒ Select min(sal) from emp where sal != (select min(sal) from emp);

27) Display max sal of Sales department

⇒ Select max(sal) from emp where deptno in (Select deptno from dept where dname = 'SALES');

28) Display all the emp whose job same as smith, dept same as Jones and sal > Turner

⇒ Select \* from emp where job in (select job from emp where ename = 'SMITH') and deptno in (select deptno from emp where ename = 'Jones') and sal > (select sal from emp where ename = 'Turner');

29) Display no of emp who comm is more than sal

30) Display the location of emp who earn max sal & have no reporting manager.

⇒ Select loc from dept where deptno in (select deptno from emp where mgr is null and sal = (select max(sal) from emp));

31) Display ename & empno of employee working as a CLERK and earn highest sal among all the clerks.

⇒ Select ename, empno from emp where job = 'CLERK' and sal in (select max(sal) from emp where job = 'CLERK');

32) Display all emp who are living in location which is having at least two 'o' in it.

⇒ Select ename from emp where location.deptno in (select deptno in (select deptno from dept where loc like '%.0%.0%'));

33) List the emp who has comm > max sal of all the salesmans and do not report to king.

⇒ Select ename from emp where comm > (select max(sal) from emp where job = 'SALESMAN') and mgr != (select empno from emp where ename = 'KING');

34) List all the dept name that are having salesmans.

⇒ Select dname from dept where deptno in (select deptno from emp where job = 'SALESMAN');

35) List all the emp who are earning sal more than any of the analyst.

⇒ Select ename, sal from emp where sal > Any (select sal from emp where job = 'Analyst');

1) Display all the employees who are joined before the last person?

⇒ Select \* from emp where hiredate < (select max(hiredate) from emp);

2) Display all the employees who are earning more than any of the manager.

⇒ Select \* from emp where sal > any (select sal from emp where job = 'MANAGER');

3) List employees who joined after 4 years of 1<sup>st</sup> emp of the company and less than Blake salary.

⇒ Select \* from emp where hiredate > select add-months(min(hiredate), 4\*12) from emp and sal < (select sal from emp where ename = 'BLAKE');

4) Display all the emp whose dept is sales and who is earning some comm (i.e. comm is not null or zero) and who is hired before the last person hired.

⇒ Select \* from emp where comm is not null and hiredate < (select max(hiredate) from emp) and deptno in (select deptno from dept where dname = 'SALES');

5) Display all the dept names for <sup>f</sup>ward's man's manager

⇒ Select dname, mgr from emp e, dept d where e.deptno = d.deptno and empno in (select mgr from emp where empno in (select mgr from emp where ename = 'WARD'));

6) Display dept name of the employee who earn minimum sal and have reporting manager.

⇒ Select dname from dept where deptno in (select deptno from emp where sal = (select min(sal) from emp where mgr is not null));

7) Display the dname of emp's whose salary is max salary but Lesser than 3000.

⇒ Select dname from dept where deptno in (select deptno from emp where sal in (select max(sal) from emp where sal < 3000));

8) Display last employee record according to empno

⇒ Select \* from emp where empno = (select max(empno) from emp);

9) Select ename of emp who earns 2<sup>nd</sup> max salary & works for location 'DALLAS'

⇒ Select ename from emp e where e.deptno ≠  
 Select ename, dname from emp e, dept d where  
 e.deptno = d.deptno and e.sal in (select max(sal) from emp where sal < (select max(sal) from emp)) and  
 loc = 'DALLAS';

10) List emp's who have commission greater than max sal of all the salesman & who do not report to King.

⇒ Select \* from emp where comm > (select sal from emp where sal = (select max(sal) from emp where job = 'SALESMAN')) and mgr ≠ (select empno from emp where ename = 'KING');

## Subqueries - Group By -

- 1) list deptname having atleast 3 salesman.

Select dname from dept where deptno in (select deptno from emp where job = 'SALESMAN' Group By deptno having count(\*) >= 3);

- 2) list employees from research & accounting having at least 2 reporting.

Select \* from emp where deptno in (select deptno from dept where dname in ('RESEARCH', 'ACCOUNTING')) and empno in (select mgr from emp group by mgr having count(\*) >= 2);

- 3) Display the department location that is having greater than four employees in it.

Select loc from dept where deptno in (select deptno from emp group by deptno having count(\*) > 4);

- 4) Display all the employees of dept 30, 20 with there annual salary and having at least 3 employees.

- 5) List the dept name that are having at least 3 emp's but not more than 5 employees in it

$\Rightarrow$  Select dname from dept where deptno in (select deptno from emp Group By deptno having count(\*) between 3 and 5);

6) List the dept names that are having at least 3 employees in it.

⇒ Select dname from dept where deptno in (select deptno from emp group by deptno having count(\*) >= 3);

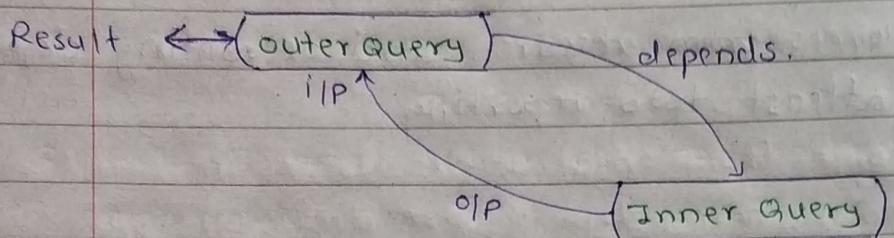
7) list employees from research and accounting dept having atleast two reporting

⇒ Select ename from emp where deptno in (select deptno from dept where dname in ('ACCOUNTING', 'RESEARCH')) and empno in (select mgr from emp group by mgr having count(\*) >= 2);

## \* Subqueries $\Rightarrow$

- 1) A queries which is written inside another query is called as a subqueries.

Working Principle of subqueries  $\Rightarrow$



- 1) Inner query executes first and output of a inner query is given to outer query as a input.
- 2) Outer query executes completely and provide the result, therefore we can say outer query depends on a inner query.

Reasons to use Subqueries -

- 1) If we have unkown values in problem statements
- 2) when data is in one table and condition is in another table. #

Note = To compare two columns in subqueries  
column should be same or datatype should be same

## \* Group By

1) Group by is used to group similar type of a data.

Emp			Emp			Emp		
ename	sal	deptno	ename	sal	deptno	ename	sal	deptno
A	100	10	A	100	10	A	100	10
B	200	20	B	200	20	C	300	10
C	300	10	C	300	10	B	200	20
D	400	20	D	400	20	D	400	20
E	500	30						

eg Select count(\*), deptno from emp where deptno != 30  
group by deptno;

Deptno	Count(*)
20	2 6 6
10	2 8 3

Syntax —

Select col-name, group function from table name where  
<filter-condition> group by col-name;

order of execution

- 1) select
- 2) from
- 3) where
- 4) group by

② Any clause after group by clause nature of execution will be group by group only.

③ We have to mention a column name which is used in a group by in a select clause. Other than that it will not allow.

Q) We can use multirow function in a group by clause.

Nature of execution -

Where  $\Rightarrow$  Row by row execution

group by  $\Rightarrow$  Row by row execution

Select  $\Rightarrow$  Group by group execution  $\Rightarrow$  After group by all clauses will execute group by group only.

ex. Q1 WAQTD total sal needed to pay each job in the emp table.

Q2 Display emp working in each dept & its avg sal excluding all the emp whose sal is less than their commission.

Q3 Display number of emp only if they are working as manager or analyst and their annual sal should ends with zero in each dept.

Q4 Display number of clerks working in each dept

Q5 Display number of employee working in each dept except for those who are working in dept 10

Q6 Display number of employees getting commission in each dept

Q7 Display number of employees getting sal more than 1600 excluding all the managers in each dept.

Q8 Display avg sal needed to pay all the employee's who are having reporting manager in each job.

Q9 Display max sal given in each designation excluding those whose name starts with 'K'.

Ans  $\Rightarrow$

① Select sum(sal) from emp where group by dept, job.

Select sum(sal), job from emp group by job;

② select emp, avg(sal) from emp where sal < comm group by dept, job;

Select count(ename), avg(sal) from emp where sal > comm group by dept no;

- ③ Select count(\*), deptno from emp where job in ('Manager', 'Analyst') and sal \* 12 like '%.0' group by deptno;
- ④ Select count(job), deptno from emp where job = 'CLERK' group by deptno;
- ⑤ Select count(\*), deptno  
from emp  
where deptno != 10  
group by deptno;
- ⑥ select count(\*), deptno  
from emp  
where comm is not null  
group by deptno;
- ⑦ select count(\*), deptno  
from emp  
where sal > 1600 and job != 'MANAGER'  
group by deptno
- ⑧ Select avg(sal), job  
from emp  
where mgr is not null  
group by job;
- ⑨ Select max(sal), job  
from emp  
where ename<sup>not</sup> like 'K%'  
group by job;

## \* Having Clause:

- 1) Having clause is similar to where clause but it is a group by filter condition. i.e. we can apply having by clause only on <sup>a</sup> having groups.

Difference between having and where clause.

Having	Where
① Use after group by clause	① Use before group by clause
② Order of execution or nature of execution is	② Order of execution or nature of execution is
③ group by group	③ row by row
④ Used to filter the groups	④ used to filter the records
⑤ Multirow f" are allow	⑤ multirow functions are not allow
⑥ Dependents on group by	⑥ Independent

Syntax = Select col-name, group function  
 from table name  
 where <filter-condition>  
 group by col-name  
 having <group filter condition>

Order of execution	Nature of execution
⑤ select	where → Row by row
① from	Group → Row by row
② where	having → Group by group
③ group by	Select → group by group
④ having	

Questions →

- 1) GIAQTD hiredate on which at least 3 emp got hire
- 2) Display deptno which has more than 2 emp & total amt required to pay monthly sal of all the employees in that dept should be more than 5000.
- 3) Display the salaries which has repetition in the sal column of the emp table.
- 4) Display the name only if more than one person in the emp of the company has same name.
- 5) Display the number of employees hire into same date
- 6) Display number of employees getting same salary working in same dept.
- 7) Display number of employees whose name starts with vowel in each dept.

Ans. ↗

- ① Select hiredate, count(\*) from emp group by hiredate having count(hiredate)  $\geq 3$
- ② Select deptno, count(\*) from emp group by deptno having count(\*)  $> 2$  and sum(sal)
- ③ Select count(sal) <sup>sal</sup> from emp group by sal having count(sal)  $> 1$
- ④ Select ename from emp group by ename having count(\*)  $> 1$
- ⑤ Select count(\*), hiredate from emp group by hiredate having count(hiredate)  $> 1$
- ⑥ Select count(\*), sal, deptno from emp group by deptno having count(sal)  $>$

⑥ Select count(\*), deptno, sal from emp group by deptno,  
sal having count(sal) > 1;

⑦ Select count(\*), ename, deptno from emp where substr(ename, 1, 1) in ('A', 'E', 'I', 'O', 'U') group by deptno, ename;

1.  
Having

### \* Order by Clause

① Is used to arrange the records according to order (Ascending or descending)

② asc → used to display records in ascending order.

desc → used to display records in descending order

③ By default records will arranged in ascending order

example

① Select \* from emp order by ename; //default ascending.

② Select \* from emp order by ename asc; // Ascending order

③ Select \* from emp order by ename desc; //descending

④ Select \* from emp order by s; // used to display 5th column order in asc.

⑤ ~~Select~~ select \* from emp order by comm asc;

## \* Joins :

Joins are used to join (combine) two or more tables.

- 1) Cartesian Join / cross Join
- 2) Inner Join
- 3) Outer Join
  - a) Left Outer Join
  - b) Right Outer Join
  - c) Full Outer Join
- 4) Natural Join
- 5) Self Join

### ① Cross Join / Cartesian Join :-

- 1) It is a type of a join where we get mashed records as well as unmashed records.
- 2) 1<sup>st</sup> record of one table is joined with all other records of another table.

Syntax :

Oracle - Select \* from table1, table2;

ANSI - Select \* from table1 cross join table2;

Example:  $\Rightarrow$  Select \* from emp cross join dept;

$\Rightarrow$  Select \* from emp, dept;

EMP		Dept		ename	dname
ename	deptno	deptno	dname	A	Sales ✓
A	10	10	Sales	B	Sales X
B	20	20	Acc	A	Acc X
		30	Research	B	Acc ✓
				A	Research X
				B	Research X

## (2) Inner Join :-

- 1) It is a type of join where we get only matched records of both the tables by specifying join cond'.

(→ replaced by inner join)

Syntax :-

(where) Replaced by where cond'

Orc

Select \* from table1, table2 where {join cond'}

(Replaced by) →

ANSI

Select \* from table1 inner join table2 on  
{join cond'} where {filter conditions}

example: Select ename, dname from emp e, dept d where e.deptno

Orc  $\Rightarrow$  = d.deptno;

ename	dname
A	Acc
B	Sales

ANSI - Select ename, dname from emp e inner join dept d on  
e.deptno=d.deptno;

## Inner Join Queries

Q. ① Name of the emp and loc of all the employees.

⇒ Select ename, loc from emp e, dept d where  
e.deptno = d.deptno;

Q. ② GIAQTD dname & sal for all the emp working in acc.

⇒ Select dname, sal from emp e, dept d where  
e.deptno = d.deptno and dname = 'ACCOUNTING';

⇒ Select dname, sal from emp e inner join dept d  
on e.deptno = d.deptno and where dname = 'ACCOUNTING'.

Q. ③ GIAQTD dname, and annual sal for all the employee  
whose sal is more than 2340.

⇒ Select dname, sal \* 12 from emp e, dept d where  
e.deptno = d.deptno and sal > 2340;

⇒ Select dname, sal \* 12 from emp e inner join dept d  
on e.deptno = d.deptno where sal > 2340;

Q. ④ GIAQTD ename, dname for employees having character  
A in their dname.

⇒ Select ename, dname from emp e, dept d where  
e.deptno = d.deptno and dname like '%.A%';

⇒ Select ename, dname from emp e inner join dept d  
on e.deptno = d.deptno where dname like '%.A%';

Q. ⑤ GIAQTD ename, dname for all the employees working  
as salesman.

⇒ Select ename, dname from emp e, dept d where  
e.deptno = d.deptno and job = 'SALESMAN';

Q. ⑥ CHAQTD dname & job for all the employees whose job and dname starts with character S.

⇒ Select dname, job from emp e, dept d where e.deptno = d.deptno and job like 'S%' and dname like 'S%';  
 $\therefore \text{substr(job, 1, 1)} \text{ in ('S')}$

Q. ⑦ CHAQTD dname & mgr no for employees reporting to 7839.

⇒ Select dname, mgr from emp e, dept d where e.deptno = d.deptno and mgr = 7839

Q. ⑧ CHAQTD dname & hiredate for employee hiredate after 83 into accounting or research dept.

⇒ Select dname, hiredate from emp e, dept d where e.deptno = d.deptno and hiredate to\_char(hiredate, 'yy') > 83 and dname in ('Accounting', 'Research');

Q. ⑨ CHAQTD ename & dname of the employees who are getting comm in dept 10, 30

⇒ Select ename, dname from emp e, dept d where e.deptno = d.deptno and comm is not null and e.deptno in (10, 30);

Q. ⑩ CHAQTD dname & empno for all the employees whose empno are (7839, 7902) and are working in loc new york.

⇒ Select dname, empno from emp e, dept d where e.deptno = d.deptno and empno in (7839, 7902) and loc = 'new york';

Q.11 GIAQTD loc & avg(sal) given for each location by excluding all the employees whose second char is A in their name.

⇒ Select loc, avg(sal) from emp e, dept d where e.deptno = d.deptno and group by loc and ename not like '\_A%' group by loc;

Q.12 GIAQTD name of the emp and his loc if employee is working as manager and working under the employee whose empno is 7839

⇒ Select ename, loc from emp e, dept d where e.deptno = d.deptno and job = 'MANAGER' and mgr = 7839;

Q.13 GIAQTD dname and employee id's of all the employees who are clerks & having reporting managers.

⇒ Select dname, empno from emp e, dept d where e.deptno = d.deptno and job = 'CLERK' and mgr is not null;

Q.14 GIAQTD dname and total salary given to that dept if there are atleast 4 employees working for each dept.

⇒ Select dname, sum(sal) from emp e, dept d where e.deptno = d.deptno group by dname having count(\*) >= 4;

Q.15 COUNT dname & number of employees working in each dept only if there are manager or clerks.

⇒ Select dname, count(\*) from emp e, dept d where e.deptno = d.deptno and job in ('MANAGER', 'CLERK') group by dname;

## 2/04/21 \* Outer Join

① Left Outer Join :- we will get matched records of both the table as well as unmatched records of the left table.

Syntax :-

ANSI - Select \* from table1 left join table2 on table1.col-name = table2.col-name ;

ORC - Select \* from table1, table2 where table1.col-name = table2.col-name (+);

emp				dept		Left Join	
ename	deptno	dname	deptno			ename	dname
A	10	CS	10			A	CS
B	20	IT	20	⇒		B	IT
C	30	Mech	30			C	Mech
D	50	Civil	40			D	

example ⇒ Select ename, dname from emp e, dept d where e.deptno = d.deptno (+);

ORC

Select ename, dname from emp e left join dept d on e.deptno = d.deptno ;

ANSI

② Right Outer Join :- In this we will get matched records of both the tables as well as unmatched records of right table.

Syntax :-

ANSI : Select \* from table1 right join table2 on  
table1.col-name = table2.col-name ;

Or : Select \* from table1, table2 where  
table1.colname ~~not~~ = table2.colname ;

Right Join

ename	dname
A	CS
B	IT
C	Mech
	Civil

example ⇒ Select ename, dname from emp1e, deptd . where  
e.deptno ~~not~~ d.deptno

ANS1 →  
Select ename, dname from emp1e Right join  
deptd on e.deptno = d.deptno;

- ③ Full Outer Join :- we will get matched records of both the tables as well as unmatched records of both the table (right & left).

For full outer join we don't have a oracle syntax.

Syntax :-

ANS2 - Select \* from table1 full join table2 on table1.col-name = table2.col-name;

Full Outer Join

ename	dname
A	CS
B	IT
C	MECH
D	Civil

example      Select ename, dname from emp e full join dept d on e.deptno = d.deptno;

ANS2

## Natural Join

demo		
ename	deptno	loc
A	10	Pune
B	20	Mumbai
C	30	Pune
D	40	Nagpur

demo1			loc
dname	deptno	Address	loc
CS	10	PUNE	PUNE
IT	20	Mumbai	Mumbai
METH	30	PUNE	PUNE
Civil	40	Nagpur	Kolhapur

Select \* from demo natural join demo1;

(S) Self Join :- Joining same table

> Select emp.\* , sal+100 from emp;

select e1.empno, e1.ename, e2.empno, e2.ename from emp e1,  
emp e2 where e1.mgr = e2.empno;

E1			E2		
Empno	ename	MGR	Empno	ename	MGR
1	A	4	1	A	4
2	B	5	2	B	5
3	C	2	3	C	2
4	D	1	4	D	1
5	E		5	E	

? Select e1.empno, e1.ename, e2.empno, e2.ename, e3.empno, e3.ename from emp e1, emp e2, emp e3 where e1.mgr = e2.empno and e2.mgr = e3.empno;

> Select e1.ename, e2.ename from emp e1,emp e2 where  
e1.empno = e2.empno and e1.ename = 'BLAKE';

- 1] Join to same tables is called as a self join
  - 2] Self join is majorly used to identify employee manager relation.

- ⑧ Display the name and salary of the employee who is working as a ~~blocks~~ & blocks manager.

三

Select e1.ename, e2.sal, e2.ename from emp e1, emp e2  
where e1.mgr = e2.empno and e1.ename = 'BLAKE'

Q Display name of the emp who are working under king.

⇒ Select e1.ename, from emp e1, emp e2

where e1.mgr = e2.empno and e2.ename = 'KING';

Q Display name of the emp as well as deptname  
who is working as a Ford's manager.

⇒ Select e2.ename, dname .from emp e1, emp e2 ,dept  
where e1.mgr = e2.empno and e2.deptno = d.deptno,  
e1.ename = 'FORD';

Q Display details of the employee as well as its manager  
managers location and sal.

⇒ Select e1.\* , e2.loc , e3.sal from emp e1, emp e2, emp e3  
from where e1.mgr = e2.empno and e2.mgr = e3.empno and  
e3.deptno = d.deptno

Q Display details of 'ADAMS' manager & location of  
managers manager

Q Display details of the emp who are working for  
'SMITH'S managers manager.

⇒ select e4.\* from emp e1, emp e2, emp e3, emp e4

where e1.mgr = e2.empno and e2.mgr = e3.empno and  
e3.mgr = e4.empno and e1.ename = 'SMITH'

Q Display name and location of the employee who is  
working as a 'BLAKE'S manager.

⇒ select e2.name, loc from emp e1, emp e2 ,dept d where  
e1.mgr = e2.empno and e1.ename = 'BLAKE' and  
e2.deptno = d.deptno;

Q Display details of the employees who was hired before Smith manager.

⇒ Select e3.\* from emp e1, emp e2, emp e3 where e1.mgr = e2.empno and e2.mgr = e3.empno and e1.ename = 'SMITH' and e3.hiredate < e2.hiredate;

Assignment

Q List ename, job, annual sal, deptno, dname who earn 30000 per year and who are not clerks.

⇒ Select ename, job, sal \* 12 annual\_sal, emp.deptno, dname from emp, dept where emp.deptno = dept.deptno and sal \* 12 > 30000 and job != 'CLERK';

Q List out the all employees by name and employee number along with their manager's name and empno.

⇒ Select e1.ename, e1.empno, e2.ename, e2.empno from emp e1, emp e2 where e1.mgr = e2.empno (+);

Q Display ename, dname even if there no employees working in a particular department

⇒ Select ename, dname from emp, dept where e.deptno (+) = d.deptno;

Q Display the department name along with total salary in each department.

⇒ Select dname, sum(e1.sal) from emp e1, dept d where e1.deptno = d.deptno group by dname;

Q Display employee name and department name for each emp.

⇒ Select e1.ename, d.dname from emp e1, dept d where e1.deptno = d.deptno;

- 6) Display location name of the emp who earn comm.  
 ⇒ Select d.loc, e.ename from dept d, emp e where  
~~e.deptno = d.deptno and comm is not null;~~
- 7) Display dept name of the emp who earn min salary and have no reporting manager.  
 ⇒ Select d.dname from dept d, emp e where  
~~e.deptno = d.deptno and sal = (select min(sal) from emp)~~  
~~where mgr is null);~~
- 8) Display dept name, loc of all the employees who are reporting to smith.  
 ⇒ Select d.dname, d.loc from dept d . where emp.deptno =  
~~d.deptno and mgr = (select empno from emp where  
 ename = 'SMITH');~~  
 ~ No rows selected.
- 9) List all the dept name and location of all the salesman manager's manager.  
 ⇒ Select dname, loc from dept d, emp e where d.deptno =  
~~e.deptno and job in ('SALESMAN', 'MANAGER') and empno  
 in (select mgr from emp where job = 'MANAGER');~~
- 10) List employees who are working in research dept and they are manager.  
 ⇒ Select ename from emp e, dept d where d.deptno = e.  
~~deptno and dname = 'RESEARCH' and job = 'MANAGER'~~
- 11) Display the number of emp who are getting salary less than the blake's manager.  
 ⇒ Select count(\*) from emp e where sal < (select sal from emp where empno = (select mgr from emp where  
 ename = 'BLAKE'));  
 ~ 13

12) list the employee deptname and location of all the emp's who are analyst, reporting to BLAKE.

⇒ Select ename, dname, loc from emp e, dept d where e.deptno = d.deptno and job = 'ANALYST' and mgr = (Select empno from emp where ename = 'BLAKE');

13) Display the employee names, Hiredate, comm of FORD's manager.

⇒ Select ename, hiredate, comm from emp e where empno = (Select mgr from emp where ename = 'FORD')

14) Display ename, dname of all the employees whose sal less than avg sal of dept 30.

⇒ Select ename, dname from emp e, dept d where e.deptno = d.deptno and sal < (select avg(sal) from emp where deptno = 30 group by deptno);

15) Display ename, dname and loc of all the emp's who are working for jones.

⇒ Select ename, dname, loc from emp e, dept d where e.deptno = d.deptno and mgr = (select empno from emp where ename = 'JONES');

16) Display ename, dname of all the employees whose name starts with S.

⇒ Select ename, dname from emp e, dept d where e.deptno = d.deptno and ename like 'S%';

17) list the dname who are not having any employee in it.

⇒ Select dname from dept where deptno not in (select distinct deptno from emp);

⇒ Select dname from emp, dept where emp.deptno(+)=dept.deptno and ename is null;

18) Display all the dept names irrespective of any emp working in it or not, if an emp is working display his name.

⇒ select dname, ename from emp e right outer join dept d on e.deptno = d.deptno;

- 19) CWAGTD emp name, job, dname, loc of all employees who are working as actual managers and works at chicago.
- ⇒ Select ename, job, dname, loc from emp e, dept d where e.deptno = d.deptno and empno in (select mgr from emp) and loc = 'CHICAGO';
- 20) list the dept names in which the employees are hired bet<sup>n</sup> 1st of JAN 1981 and 31st Dec 1982 with salary more than 1800.
- ⇒ Select dname, hiredate from emp e, dept d where e.deptno = d.deptno and hiredate between '01-JAN-1981' and '31-DEC-1982' and sal > 1800;
- 21) Display 2<sup>nd</sup> least salary from emp table.
- ⇒ Select min(sal) from emp where sal > (Select min(sal) from emp);
- ⇒ Select min(e2.sal) from emp e1, emp e2, ~~emp e3~~ where e1.sal < e2.sal;
- 22) List the employees whose annual sal is greater than 1500 and who are joined before 1982 only.
- ⇒ Select ename, hiredate from emp where sal \* 12 > 1500 and hiredate < '01-JAN-1982';
- 23) Display emp name along with their manager name.
- ⇒ Select e1.ename, e2.ename from emp e1, emp e2 where e1.mgr = e2.empno;
- 24) Display emp name and his dept name for the employees whose name starts with 'S'.
- 1) ⇒ Select ename, dname from emp e, dept d where e.deptno = d.deptno and substr(ename, 1, 1) = 'S';
- 2) ⇒ Select ename, dname from emp e, dept d where e.deptno = d.deptno and substr(ename, 1, 1) = 'S';
- 3) ⇒ Select ename, dname from emp e, dept d where e.deptno = d.deptno and ename like 'S%';