CONCURRENCY CONTROL

[Locks]

→ Lock is a mechanism which is used to control the transactions performed by the multiple users ~~at the~~ ~~same~~ on the same record or on the same table simultaneously

→ Locks are divided into two types :-

(i) Implicit lock
(ii) Explicit lock

Implicit lock :-

→ The locking operation which is performed by the system automatically is known as Implicit lock.

Explicit lock :-

→ The locking operation which is performed by the user manually is known as explicit lock.

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→ we can perform the locking operations in three levels :-

(i) Row level lock

(ii) Page level lock

(iii) Table level lock

(i) <u>Row level lock</u> :-

→ Locking specific record of the table is known as row level lock.

→ If one user lock a specific record of the table, it won't allow the other users to perform any kind of operations such as update & delete on that record.

NOTE :- Implicit lock always performs row level lock.

→ we can also perform row level lock explicitly also

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जिसने record पे lock लगाया दूसरा user केवल उस record को access नहीं कर पायेगा unless commit & rollback command is given by user who gives lock :-

explicit row level lock :-

Syntax :-
select * from <table name> where <condition> for update of <column name>.

Eg :-
select * from emp1 where eid =104 for update of sal;

ii) PAGE LEVEL LOCK :-

→ Locking specific records in a table is known as page level lock.

→ If one user locks some specific records in the table it won't allow the other users to perform operations on those records.

Syntax for explicit page level record :-

Select * From <table Name> where <condition> for update of <column Name>

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Select * from emp1 where
eid = 104 or eid = 106 or eid = 108
for update of sal ;

/

NOTE :- Implicit lock cannot be perform on page level record.

(iii) TABLE LEVEL LOCK :-

→ locking the complete table is known as table level lock.

→ If user lock the table it won't allow the other user to perform any kind of operations such as update, delete, and insert except select.

→ we can lock the table in 3 modes :-

(i) Share mode
(ii) Share update mode
(iii) exclusive mode.

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Share mode :-

One user lock the table in share mode that it won't allow the other user to perform any kind of operations such as delete, update & insert except select.

→ The importance of this mode is even though one user lock the table still it will allow other user to lock the same table.

→ more than one user lock the same table, If they are trying to perform operations from their ends then these operations are collide each other then automatically 'deadlock' situation will be arised

Syntax :-

lock table <table Name> in share mode;

ii) Exclusive mode :-

→ If one user locks the table in exclusive mode it won't allow the other users to lock the same table.

→ So in this spectral mode only one user can lock the table.

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Syntax :-

lock table <table Name> in exclusive mode

Eg :-

lock table imp in exclusive mode;

Share update mode :-

If one user locks the table in share update mode. still it will allow the other user to perform the operations on the records except the record or the records which is accessed by the first user.

→ even though it mode belongs to table level catagorie it is internally working as row level lock or page level lock.

Syntax :-

lock table <table Name> in share update mode;

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Wait / Nowait :-

→ Generally, while locking any record of the table we need to give these two options.

→ If you give wait time option then it will display some error message ingerant of the second user that is :-

ORA-30006 : resource busy ; acquire with WAIT timeout expired

Eg :-

select * from scott.emp1 for update of sal wait 10;

~~[illegible]~~

The above command will display the above message after 10 seconds.

Nowait :-

select * from scott.emp1 for update of sal Nowait;

→ Above command will display the following error message immediately.

* ORA-00054: resource busy and acquire with NOWAIT specified or timeout expired.

* Pseudo columns :-
sysdate, current_date, Rowid, Rownum, user, user id, next val.

DATA-BASE OBJECTS :-

1) SEQUENCE :-

→ It is the database object which automatically generates unique numeric values on a specific column in the table.

→ Sequence default value starts from 1 and automatically incremented with +1; upto user requirement.

→ We can also start the sequence number with our own starting value and also we can increment by more than one and we can give some stopping condition.

Syntax to create sequence

→ Create sequence <sequence Name>

Eg :-

Create sequence S;

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applying the sequence on specific column of the table :-

Insert into <table Name> values
(Sequence Name. Next val , &col2 ...
&coln);

Insert into emp1 values
(s.nextval, '&ename', '&sal',
&deptno);

In the above example next val represent the pseudo column & it has two advantages

(i) It initiates the sequence number

(ii) It generates the next value of the sequence.

Syntax to see the current value of the sequence :-

Select <Sequence Name>. currval
from dual;

Select s.currval from dual;

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Syntax to apply different sequence on different columns :-

insert into emp1 values (s6.nextval,
'e ename', 'e deptno',
s7.nextval);

Sequence to change the old sequence name to new sequence name

Rename s to m;

Syntax to drop the sequence
drop sequence <sequence name>;
Eg:- drop sequence m;

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SYNONYMS

→ Synonym is a database object which is the alternate / duplicate name for original base table.

→ Whenever one user trying to access another ~~sequence~~ user table he has to mention the owner name along with the table name.

→ If we want to hide owner name by or the object name we need to create the synonym based on table.

→ once we create synonym based on table then it will be created on the complete table. we can't create a synonym base on partial table.

→ If we perform any operation on the ~~table~~ base table same operations automatically affected to synonym and if we perform any operation to synonym same operation will be affected on base table.

→ We can create a synonym based on another synonym

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→ We can't create synonym based on more than one table.

→ If we modify structure of table then same modification automatically affected to the corresponding synonym but we can't modify structure of synonym.

→ We can create synonym with / without base table.

→ If we create synonym without base table synonym will become invalid.

→ On invalid synonym we can't perform any operation

→ once we drop the synonym corresponding synonym will not be dropped but it becomes invalid.

→ Synonym becomes invalid in two cases :-

(i) When we drop base table

(ii) When we change table name

→ We can make invalid synonym as valid synonym. ~~by making~~

Syntax to create Synonym :-

Create synonym < Synonym Name >

for username . table Name

Create Synonyms for scott-emp;

Syntax to change Synonym Name :-

→ Rename <old Synonym Name> to
<New Synonym Name>

Eg :- Rename s to n;

Syntax to drop synonym,

→ Drop Synonym <Synonym Name>

Public Synonym :-

Syntax :-

Create public Synonym m1 for Scott.emp,

Syntax to see all the list of Synonyms :-

→ Select * from user_Synonyms.

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VIEWS :-

Physical object :- It is the object occupies some space permanently

Logical object :- It is a object which occupies some space temporarily

Views :-

It is a logical database object which contains the logical representation of data.

(i) View is the virtual table

(ii) The main advantage of creating the view is, we can hide some confidential information from the other user.

(iii) we can can create a view based on the complete table and also partial table.

(iv) If we perform any operations on the view, same operations will be affected to the corresponding base table & vice versa

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(V) We can create a view based on another view upto the user requirement

(VI) Since we drop the table the corresponding view may not dropped & it becomes invalid.

(VII) We can create ~~table~~ view based on one table or more than one table

(VIII) View will become invalid in three cases :-
(i) while we drop the table
(ii) while change table name
(iii) while modify the structure of table

(IX) on invalide view we can't perform any kind of operations.

(X) We can make invalid view as valid view

(XI) We can create a view with / without base table.

(XII) View are divided into two types :-
(a) simple view
(b) complex view

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Simple View :-

→ Creating a view based on single table is called Single view

Complex View :-

→ creating a view based on more than one table is called as complex view.

Syntax to create a view :-

Create view <View Name> as Select * from <source table Name>

Eg :- Create view V as Select * from emp 1;

Syntax to create view based on partial table :-

Create View <view Name> as Select col1, col2 .. coln from <table Name>

Eg :- create view V_2 as Select eid, ename from emp 1;

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Syntax to create a view without a base table :-

Create force view <view Name> as select * from <table Name>;

Eg :- Create force view V_3 as select * from satya;

Syntax to create Read only views :-

→ It is a special type of views on which we can perform only select operations but not update, delete & Insertion.

Create view <View Name> as select * from <table Name> with read only.

Eg :- Create view rov as select * from emp1 with read only

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Syntax to create the view with selection of some rows or columns

create view <view Name> as
select * from <table Name>
where <condition>

Syntax to create a view with check option :-

create view <view Name> as
select * from <table Name>
where <condition> with
check option

Eg :-
create view V6 as select *
from emp1 where dept no in
(10,20) with check option;

/

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Syntax to creat complex view :-

Create view <View Name> as
Select * from <tab1>, <tab2> ...
<tabn> where <condition>;

Eg :-
Create view CV as
Select emp.*, dname, loc from
emp, dept where
emp.deptno = dept.deptno

NOTE :- we cannot perform any kind of operations on complex views, if you want to perform operations on complex views we need to use instead of triggers.

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SUB-QUERRIES

A Querry within a Querry is known as subquery or nested Querry. whenever one Querry execution depending on another querry result than we need to use subquerries.

→ we can write a querry within a querry up to the user requirment.

→ Subquerries are divided into two types :-

1) Non correlated subquerries
   - SRS Q
   - MRS Q

2) correlated subquerries.

Non correlated querries :-

→ In this querry inner querry is the input for outer querry so outer querry need to wait to execute till it gets the result of inner querry.

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Subqueries (Non-Correlated) are further divided into two types :-

1) Single row Subquery
2) multiple row subquery

1) <u>Single Row Subquery</u> :-

→ If inner query returns only one value then those querries can be called as single row subquery

→ The operators which are using in single row subqueries are :-

=, >, <, >=, =<, ! =, etc

→ These operators can be called as single row operators

→ Single row subqueries are performed in two cases :-

1) when we perform operation of primary key
2) or we use any multiple row function

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3) Multiple row Subqueries :-

If inner query returns more than one value than those queries can be called as multiple row subqueries. The operators which are using in multiple row subqueries are 'in', 'all', 'any', 'some'.

Note :- Functionally any & some both are same.

Q WAQ to display emp details whose sal is less than sal of emp 7788?

Ans: Select * from emp where sal < (Select sal from emp where empno = 7788);

Q WAQ to display the employee details whose salary is less than the salary of 7788 and getting commision & display in ascending order.

Ans: Select * from emp where sal < (select sal from emp where emp no = 7788 and comm is not null) order by comm

SUB - QUERRIS

If you want to get the ~~data~~ data from one table but before getting that data you are checking the condition in other table. In that case we need sub- Queries.

Query within other Query

```
Select .... tab1
where <cond> ( Select --- Tab2 );
```

sub Query

Execution process

Inner most Query
To
Outer most Query

} Except in case of correlated subqueries

Types of subqueries :-

1. Single Row subQuery (=)
2. multi Row subQuery (IN)

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→ To write a subquery we n
one common column

cid	c name
1	I
2	II
3	III
4	IV
5	V
6	VI

tbl class

sid	sname	add	gender
1	Anand	Jaipur	M
2	Amit	Alwar	M
3	Vishakha	Jaipur	F
4	Ankita	Jaipur	F
5	neha	Unai	F
6	Gaurav	Sikar	M

tbl student

→ select sname, add, gender from tblStuden
where cid in (select cid from tble
where cname = 'II');

Note यहाँ पर
दो का का एक
ही column का
specify करते

→ In subquery we can't use order by.
→ we can use order by outside sub

Faculty table

Fid	Fname	Qualification	Dept Id
—	—	—	—
—	—	—	—
—	—	—	—

Department table

dept Id	dname
1	IT
2	CSE
3	ECE
4	EEE

WAQ, Name of faculty working in IT?

```
Select Fname from Faculty where
deptId in ( Select dept Id from
department where dname = 'IT' );
```

↳ inner query का result 1 आएगा

WAQ, to find name of faculty working in IT or CSE department?

Ans:

```
Select FName from Faculty where
deptId in ( Select dept Id from
department where dname = 'IT'
OR dname = 'CSE' )
```

↳ Inner Query का result 1, 2 आएगा

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Average marks of students who c
not from department 1 or 3?

Ans:

Student

Sid	Sname	Branch	Marks
—	—	—	—
—	—	—	—
—	—	—	—

Department

dept id	dpname
— 1	— IOT
— 2	— CSE
— 3	— ECE
— 4	— EEE

Select branch, avg(marks) fr
student where branch in
(Select dname from department
where dept id not in (1, 3))

Branch	avg(marks)
CSE	68.5

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EXIST | NOT EXIST

Syntax

Select * from table name
where
Exists | Not exists (subquery);

Exists:- It is use to test for the existence of any record in a subquery
↳ अगर inner query ने एक भी value return की then बाहर वाली query fire हो गई।

Eg:-

Select * from student where exists
(select * from department where
dept id = 1);
↳ ये तो IT return करेगा hence हमारी ऐसे बाहर वाली query चलेगी।

→ It is use to check that अगर वाली कुछ return कर रही है या नहीं।

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Q WAQ to display maximum salary employee details?

Ans: Select * from emp where sal = (
Select max(sal) from emp);

~~Q WAQ to display the maximum salary employee details where salary is less than 7788?~~

~~Ans. select * from emp where sal = (select max(sal) from emp where (select sal from emp where deptno = 7788));~~

Q WAQ display the minimum salary emp details?

Ans.
Select * from emp
where sal = (select min(sal)
from emp);

Q WAQ to display the max salary employee details where salary is less than ~~7788~~
sal of emp. no = 7788?

Ans: select * from emp where sal = (select max (sal) from emp where sal < (select sal from emp where empno = 7788))

Q. WAQ to display employee details where salary is greater than min salary?

Ans: select * from emp where sal > (select min(sal) from emp);

Q. WAQ to display the employee details whose salary is less than maximum salary?

Ans: select * from emp where sal < (select max(sal) from emp);

Q. WAQ to display the employee max salary employee details join in year of 81?

Ans: select * from emp where sal = (select max(sal) from emp where sal in (select sal from emp where joindate like '%81'));

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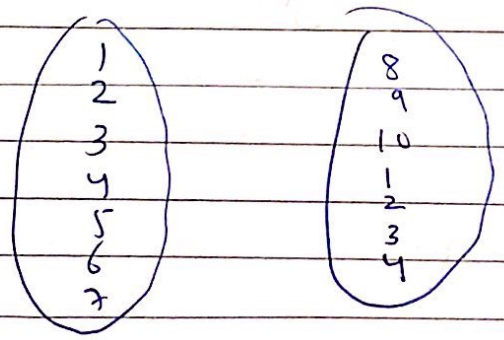
SET operators

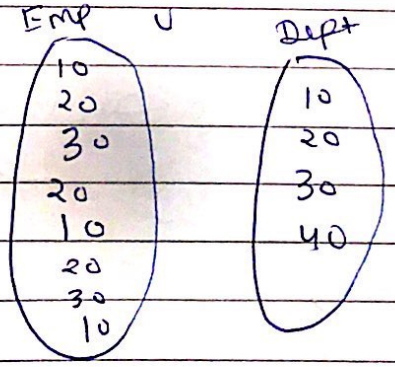
→ These operators are divided into four types:-

1. union
2. union all
3. Intersect
4. Minus

union :- This operator returns all the value from all the sets excluding duplicate values.



$A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$



$E \cup D = \{10, 20, 30, 40\}$

→ Select dept from emp
union
select dept from dept;

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union all :-

This operator returns all the values from all the sets including duplicate values

E ∪ D = { 10, 10, 10, 10, 20, 20, 20, 20, 30, 30, 30, 40 }

→ Select deptno from emp
union all
Select deptno from dept;

Intersect :-

→ This operator returns the common values from all the tables

E ∩ D = { 10, 20, 30 }

→ Select deptno from emp
Intersect
Select deptno from dept;

Minus :-

This operator returns the value which are available in one set but not available in another set.

E − D = { 0 }

D − E = { 40 }

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→ Select deptno from emp
minus
select deptno from dept;

= 0

Q WAQ display the max salary & minimum salary employee details.?

Select * from emp where sal = (select max(sal) from emp)

union

select * from emp where sal = (select min(sal) from emp)

/

Q WAQ to display the highest ~~salary~~ exp emp details & last employee ~~salary~~ exp details ?

Ans:

select * from emp where hiredat = (select min(hiredate) from emp)

union

select * from emp where hiredate = (select max(hiredate) from emp)

/

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Q WAQ to display the employee details who are working under blake ~~employee~~ ?

Ans: Select * from emp where mgr = (
Select empno from emp where
ename = 'BLAKE')

Q WAQ to display max salary employee details, min salary employee detail working under Blake?

Ans: Select * from emp where sal = (
Select max(sal) from emp where
mgr = (Select empno from emp
where ename = 'BLAKE'))
union
Select * from emp where sal = (
Select min(sal) from emp where
mgr = (Select empno from emp
where ename = 'BLAK'))

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Q WAQ who are working under Sales department?

Ans:

```
Select * from emp where deptno =(
Select deptno from dept where
dname = 'SALES')
```

Q WAQ to display the highest exp. details & least experience employee details working under Sales department,

Ans:

```
Select * from emp where hiredate=(
Select min(hiredate) from emp where
deptno = ( select deptno from
dept where dname = 'SALES'))
union
select * from emp where hiredate=(
Select max(hiredate) from emp where
deptno =( Select deptno from dept
where dname='SALES'))
```

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Q display highest experience employee working location?

Ans:

```
select loc from dept where
deptno = (
select deptno from emp where
hiredate = (
select min (hiredate) from emp))
```

Q display the president's working location?

Ans: select loc from dept where deptno = (select deptno from emp where job = 'PRESIDENT')

Q display max salary emp working location & min sal emp working location?

Ans:

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Ans: Select loc from dept where deptno = (select max(sal) from emp)
union
select loc from dept where deptno = (select min(sal) from emp)

Ans: select loc from dept where deptno = (select deptno from emp where sal = (select max(sal) from emp))
union
select loc from dept where deptno = (select deptno from emp where sal = (select min (sal) from emp))

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Q count the number of employees working in accounting department?

Ans: Select count(*) from emp where deptno (
Select deptno from dept where
dname = Accounting)

Q Display last three records in table?

Ans:
Select * from emp where
column <= (select max (rownum)
from emp)
minus
select * from emp where
rownum <= (select max (rownum)
from emp) - 3

Q maximum salary emp details of first five records?

Ans: select * from emp where sal = (
select max(sal) from emp
where rownum <= 5)

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~~Q to display the end details~~:

Q display 3rd max salary?

Ans: select max(sal) from emp where sal < (select max(sal) from emp where sal < (select max(sal) from emp))

Q WAQ to display top three max salary working in SALES department)

Ans. Select * from (select distinct sal from emp where dept no = (select deptno from dept where dname = 'SALES') order by sal desc) where ~~no~~ rownum <= 3

Q ~~top three~~ Find the sum of top three minimum salaries working in research department?

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Select sum (sal) from (
Select distinct sal from emp
where deptno = (select
deptno from dept where
dname = 'RESEARCH') order by
sal) where rownum <= 3

Q Display the highest commission employee details who are working under sales department?

Ans.
Select * from emp where comm = (
Select max(comm) from emp
where deptno = (Select deptno
from dept where ~~dno~~ dname
= 'SALES'))

Q Top three max salaries joined in year of 81?

Ans.

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