EXPT -5

**Aim:- To implement different types of locks which would maintain concurrency control**

Implementation:-

Create users in oracle

Grant connect,resource to user1 identified by user1;

Grant connect,resource to user2 identified by user2;

1. Take any two related tables which you had created before

SQL>grant resource , connect to aarti identified by 123;

Grant succeeded.

SQL>grant resource , connect to rt identified by 123;

Grant succeeded.

1. Create two users who are able to access both the tables

Enter user-name:aarti

Enter password:

Connected.

3. For the following scenarios record your observation with reasoning in the table provided’

|  |  |  |  |
| --- | --- | --- | --- |
| **Case** | **Tables acted upon** | **Observation(output)** | **Reasoning** |
| Case 1 | Emp59 | SQL> select designation from emp59 where eno=02;  DESIGNATION  ---------------  g.manager | The update done by user2 is not visible on user 1 database as the update was not committed,so this is the property of dirty read. |
| Case 2 | Emp59 | User2 is waiting for an indefinite time until user1 aborts the transaction. After usar1 rollback user2 is able to update the value. | No uncommitted data allowed. |
| Case 3 | Emp59 | Exclusive lock is not possible on user2 i.e transaction2 until user1 rollback.user2 then update the value,no change in user1 data. | Exclusive lock is not compared with shared lock.  In user1 the updated value is not displayed as user2 still has the exclusive lock so it goes into a wait state. When user2 commits or rollback then user1 can read the previousdata. |
| Case 4 | Emp59 | Row exclusive lock is not compatable with share,share row exclusive,exclusive | Row exclusive only compatable with row share and row exclusive mode. |
| Case 5 | Emp59 | In this case both user1 and user2 shared or update same data,so after that user1 will goes into wait state and deadlock is occure in user2. | Each user is waiting for a resource which the other is updating this leads to a deadlock. |
| Case 6 | Emp59 | User2 tries to update the emp59 table but goes in wait state. | In share mode updates are not allowed. |

**Case 1**: Show how locking prevents one transaction from reading uncommitted changes of another transaction

Eg:-

|  |  |
| --- | --- |
| User1 | User2 |
| SQL> select designation from emp59 where eno=02;  DESIGNATION  ---------------  g.manager  SQL> select designation from emp59 where eno=02  DESIGNATION  ---------------  g.manager  SQL> rollback;  Rollback complete. | SQL> update aarti.emp59 set designation='director'whereano=02;  1 row updated.  SQL> select designation from aarti.emp59 where ano=02;  DESIGNATION  ---------------  director  SQL> rollback;  Rollback complete. |

**Case 2**:-

|  |  |
| --- | --- |
| User 1 | User 2 |
| SQL> set transaction isolation level read committed;  Transaction set.  SQL> select ano,salary from emp59 where ename='shreya';  ANO SALARY  --------------- ----------  1 40000  SQL> update emp59 set salary=salary+1000 where ename='shreya';  1 row updated.  SQL> select eno,salary from emp59 where ename='shreya';  ANO SALARY  --------------- ----------  1 41000  SQL> rollback;  Rollback complete. | SQL> set transaction isolation level read committed;  Transaction set.  SQL> select ano,salary from aarti.emp59 where ename='shreya';  ANO SALARY  --------------- ----------   1. 40000   SQL> update aarti.emp59 set salary=salary+500 where ename='shreya';  1 row updated.  SQL> select eno,salary from aarti.emp59 where ename='shreya';  ANO SALARY  --------------- ----------   1. 40500   SQL> rollback;  Rollback complete. |

**Case 3:**

|  |  |
| --- | --- |
| User1 | User 2 |
| SQL> lock table emp59 in row share mode;  Table(s) Locked.  SQL> rollback;  Rollback complete.  SQL> select designation from emp59 where ano=03 for update of designation ;  DESIGNATION  ---------------  vice manager | SQL> lock table aarti.emp59 in row share mode nowait;  Table(s) Locked.  SQL> lock table aarti.emp59 in row exclusive mode nowait;  Table(s) Locked.  SQL> lock table aarti.emp59 in row share mode nowait;  Table(s) Locked.  SQL> lock table aarti.emp59 in share row exclusive mode nowait;  Table(s) Locked.  SQL> lock table aarti.emp59 in exclusive mode nowait;  lock table aarti.emp59 in exclusive mode nowait  \*  ERROR at line 1:  ORA-00054: resource busy and acquire with NOWAIT specified or timeout expired  SQL> lock table aarti.emp59 in exclusive mode nowait;  Table(s) Locked.  SQL> update aarti.emp59 set designation='ceo'whereano=03;  1 row updated.  SQL> rollback;  Rollback complete. |

**Case 4:**

|  |  |
| --- | --- |
| User1 | User 2 |
| SQL> lock table emp59 in row exclusive mode nowait;  Table(s) Locked.  Select loc from dept where deptno=20 for update of loc;  Output;  Rollback  output | SQL> lock table aarti.emp59 in row share mode nowait;  Table(s) Locked.  SQL> lock table aarti.emp59 in row exclusive mode nowait;  Table(s) Locked.  SQL> lock table aarti.emp59 in share mode nowait;  lock table aarti.emp59 in share mode nowait  \*  ERROR at line 1:  ORA-00054: resource busy and acquire with NOWAIT specified or timeout expired.  SQL> lock table aarti.emp59 in share row exclusive mode nowait;  lock table aarti.emp59 in share row exclusive mode nowait  \*  ERROR at line 1:  ORA-00054: resource busy and acquire with NOWAIT specified or timeout expired  SQL> lock table aarti.emp59 in exclusive mode nowait;  lock table aarti.emp59 in exclusive mode nowait  \*  ERROR at line 1:  ORA-00054: resource busy and acquire with NOWAIT specified or timeout expired  Rollback;  Output |

**Case 5:**

|  |  |
| --- | --- |
| User1 | User 2 |
| Lock table emp59 in share mode;  Output:  Table(s) loked.  update emp59 set designation='md' where ano=3;  output:  in this it will goes to a wait state till user2 either rollback or commits.  SQL> update emp59 set designation='md' where ano=3;  1 row updated. | SQL> lock table aarti.emp59 in row share mode nowait;  Table(s) Locked.  SQL> update aarti.emp59 set designation='pm' where ano=3;  1 row updated.  SQL> rollback;  Rollback complete.  SQL> lock table aarti.emp59 in share mode nowait;  Table(s) Locked.  SQL> update aarti.emp59 set designation='pm' where ano=3;  update aarti.emp59 set designation='pm' where ano=3  \*  ERROR at line 1:  ORA-00060: deadlock detected while waiting for resource  Rollback;  Output |

**Case 6:**

|  |  |
| --- | --- |
| User1 | User 2 |
| Lock table dept in share mode;  Output  Table(s) Locked.  select designation from emp59 where ano=3 for update of designation;  Output:  DESIGNATION  -----------  tester  SQL> rollback;  Rollback complete. | SQL> lock table aarti.emp59 in row share mode nowait;  Table(s) Locked.  SQL> update aarti.emp59 set designation='emp’'where ano=3;  Output:  In this user 2 will goes in wait state.  1 row updated.  SQL> rollback;  Rollback complete. |