



DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE CODE: DJS22ITL306

DATE: 5/12/2023

COURSE NAME: DBMS

CLASS: S.Y. BTech (IT) I1-Batch1

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Experiment No:9

To Examine the consistency of database using concurrency control technique (Locks)

-----EXERCISE-----

1. When user 1 locks in read mode, user 2 can read without any conflict but cannot write as read – write is a conflict.  
User 2 can read safely.

```
mysql> SELECT * FROM MYTABLE;
+----+-----+-----+
| ID | NAME  | ROLLNO |
+----+-----+-----+
| 101 | BHAVESH | 28      |
| 101 | BHAVESH | 28      |
+----+-----+-----+
2 rows in set (0.00 sec)

mysql> LOCK TABLES MYTABLE READ;
Query OK, 0 rows affected (0.00 sec)

mysql>
```

```
mysql>
mysql>
mysql>
mysql>
mysql>
mysql>
mysql> SELECT * FROM MYTABLE;
+----+-----+-----+
| ID | NAME  | ROLLNO |
+----+-----+-----+
| 101 | BHAVESH | 28      |
| 101 | BHAVESH | 28      |
+----+-----+-----+
2 rows in set (0.00 sec)

mysql>
```

2. Read – write conflict

When user 1 is locked in read mode, user 2 cannot perform write operations.

```
ERROR 1196 (HY000): Table 'mydb.mytable' doesn't exist
mysql> SELECT * FROM MYTABLE;
+----+-----+-----+
| ID | NAME  | ROLLNO |
+----+-----+-----+
| 101 | BHAVESH | 28      |
| 101 | BHAVESH | 28      |
+----+-----+-----+
2 rows in set (0.00 sec)

mysql> LOCK TABLES MYTABLE READ;
Query OK, 0 rows affected (0.00 sec)

mysql>
```

```
mysql>
mysql>
mysql>
mysql>
mysql> SELECT * FROM MYTABLE;
+----+-----+-----+
| ID | NAME  | ROLLNO |
+----+-----+-----+
| 101 | BHAVESH | 28      |
| 101 | BHAVESH | 28      |
+----+-----+-----+
2 rows in set (0.00 sec)

mysql> INSERT INTO MYTABLE VALUES(102, 'AKASH', 29);
```



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```
Query OK, 0 rows affected (0.00 sec)

mysql> UNLOCK TABLES;
Query OK, 0 rows affected (0.00 sec)

mysql> SELECT * FROM MYTABLE;
+----+-----+-----+
| ID | NAME  | ROLLNO |
+----+-----+-----+
| 101 | BHAVESH | 28      |
| 101 | BHAVESH | 28      |
| 102 | AKASH  | 29      |
+----+-----+-----+
3 rows in set (0.01 sec)
```

```
101 | BHAVESH | 28
101 | BHAVESH | 28
2 rows in set (0.00 sec)

mysql> INSERT INTO MYTABLE VALUES(102, 'AKASH', 29);
Query OK, 1 row affected (35.33 sec)

mysql>
```

User 2 waits until the lock is removed by user 1.

Then user 2 successfully performs write operation.

Similarly, if user 1 is locked in write mode, user 2 cannot perform read operations.

User 1 in write mode.

```
MySQL 8.0 Command Line Client - Unicode
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 19
Server version: 8.0.26 MySQL Community Server - GPL

Copyright (c) 2000, 2021, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input
statement.

mysql> use mydb
Database changed
mysql> LOCK TABLES MYTABLE WRITE;
Query OK, 0 rows affected (0.00 sec)

mysql>
```

```
MySQL 8.0 Command Line Client - Unicode
Copyright (c) 2000, 2021, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the c
urrent input statement.

mysql> use mydb
Database changed
mysql> SELECT * FROM MYTABLE;
```



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**3. Write – Write conflict**

Both users cannot write on the same resource at the same time as it is a conflict.

The image shows two side-by-side screenshots of the MySQL Command Line Client. The left window shows a user locking a table for write operations, while the right window shows a user attempting to select from the same table, resulting in a conflict.

```
mysql> use mydb
Database changed
mysql> LOCK TABLES MYTABLE WRITE;
Query OK, 0 rows affected (0.00 sec)

mysql> UNLOCK TABLES;
Query OK, 0 rows affected (0.00 sec)

mysql> LOCK TABLES MYTABLE WRITE;
Query OK, 0 rows affected (0.02 sec)

mysql>
```

```
mysql> use mydb
Database changed
mysql> SELECT * FROM MYTABLE;
+----+-----+-----+
| ID | NAME  | ROLLNO |
+----+-----+-----+
| 101 | BHAVESH | 28 |
+----+-----+-----+
1 row in set (1 min 0.23 sec)

mysql> INSERT INTO MYTABLE VALUES(101, 'BHAVESH', 28);
```