



Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

Experiment No.10
Implementation and demonstration of Transaction and Concurrency control techniques using locks
Date of Performance:
Date of Submission:

Aim :- Write a query to lock and unlock a table for transaction and concurrency control.

Objective :- To learn locking of tables for transaction processing and concurrency control.

Theory:



A lock is a mechanism associated with a table used to restrict the unauthorized access of the data in a table. MySQL allows a client session to acquire a table lock explicitly to cooperate with other sessions to access the table's data. MySQL also allows table locking to prevent unauthorized modification into the same table during a specific period.

Table Locking in MySQL is mainly used to solve concurrency problems. It will be used while running a transaction, i.e., first read a value from a table (database) and then write it into the table (database).

MySQL provides two types of locks onto the table, which are:

READ LOCK: This lock allows a user to only read the data from a table. **WRITE LOCK:**

This lock allows a user to do both reading and writing into a table. The following is the syntax that allows us to acquire a table lock explicitly: **LOCK**

TABLES table_name [READ | WRITE];

The following is the syntax that allows us to release a lock for a table in MySQL:

UNLOCK TABLES;

Conclusion: Locking and unlocking of tables is achieved and verified using insert command in the same table of a database system.

1. Explain Transaction and Concurrency control techniques using locks.

Transactions ensure that a series of database operations are executed as a single unit of work, either all succeed or none do. Concurrency control techniques using locks manage access to shared resources in a multi-user environment. Locks can be applied at various levels, such as database, table, or row, to prevent conflicts between transactions.

In short, transactions ensure atomicity, consistency, isolation, and durability of database operations, while concurrency control techniques using locks prevent data inconsistency and ensure data integrity by managing concurrent access to shared resources.



Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

Implementation:

-- Lock the Song table for write operations

LOCK TABLES Song WRITE;

-- Start a transaction

START TRANSACTION;


-- Perform operations on the locked table (e.g., insert, update, delete)

-- Commit the transaction


COMMIT;

-- Unlock the table after transaction completion

UNLOCK TABLES;



```
1  -- Lock the Song table for write operations
2  • LOCK TABLES Song WRITE;
3
4  -- Start a transaction
5  • START TRANSACTION;
6
7  -- Perform operations on the locked table (e.g., insert, update, delete)
8
9  -- Commit the transaction
10 • COMMIT;
11
12 -- Unlock the table after transaction completion
13 • UNLOCK TABLES;
```



Database	Table	In_use	Name_locked
Musiclbrary_management_system	room	0	0

Conclusion: Locking and unlocking of tables is achieved and verified using insert command in the same table of a database system.

1. Explain Transaction and Concurrency control techniques using locks.



Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

Transactions ensure that a series of database operations are executed as a single unit of work, either all succeed or none do. Concurrency control techniques using locks manage access to shared resources in a multi-user environment. Locks can be applied at various levels, such as database, table, or row, to prevent conflicts between transactions.

In short, transactions ensure atomicity, consistency, isolation, and durability of database operations, while concurrency control techniques using locks prevent data inconsistency and ensure data integrity by managing concurrent access to shared resources.