DBMS - Experiment 10

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AIM:

Implement Transaction and Concurrency control techniques.

Theory:

A transaction is a logical unit of processing in a DBMS which entails one or more database access operation. In a nutshell, database transactions represent real-world events of any enterprise.

All types of database access operation which are held between the beginning and end transaction statements are considered as a single logical transaction. During the transaction the database is inconsistent. Only once the database is committed the state is changed from one consistent state to another.

Concurrency control is the procedure in DBMS for managing simultaneous operations without conflicting with each another. Concurrent access is quite easy if all users are just reading data. There is no way they can interfere with one another. Though for any practical database, would have a mix of reading and WRITE operations and hence the concurrency is a challenge.

Concurrency control is used to address such conflicts which mostly occur with a multi-user system. It helps you to make sure that database transactions are performed concurrently without violating the data integrity of respective databases.

Therefore, concurrency control is a most important element for the proper functioning of a system where two or multiple database transactions that require access to the same data, are executed simultaneously.

Concurrency Control Protocols

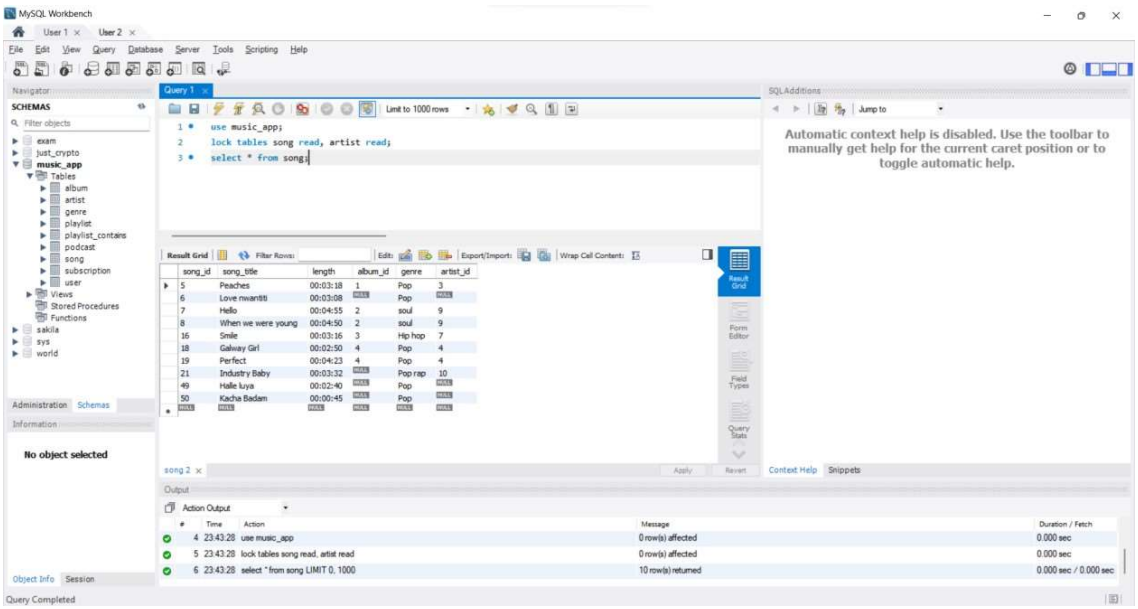
Different concurrency control protocols offer different benefits between the amount of concurrency they allow and the amount of overhead that they impose.

- Lock-Based Protocols
- Two Phase
- Timestamp-Based Protocols
- Validation-Based Protocols

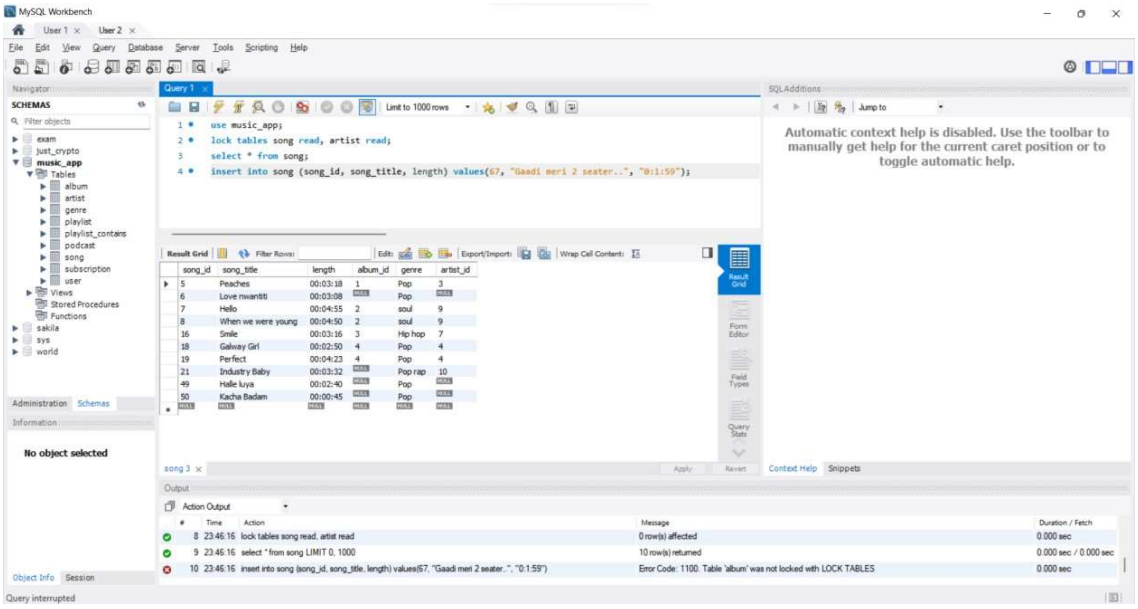
Concurrency control using Mysql Locks screenshots:

1. **User 1 acquires read lock**

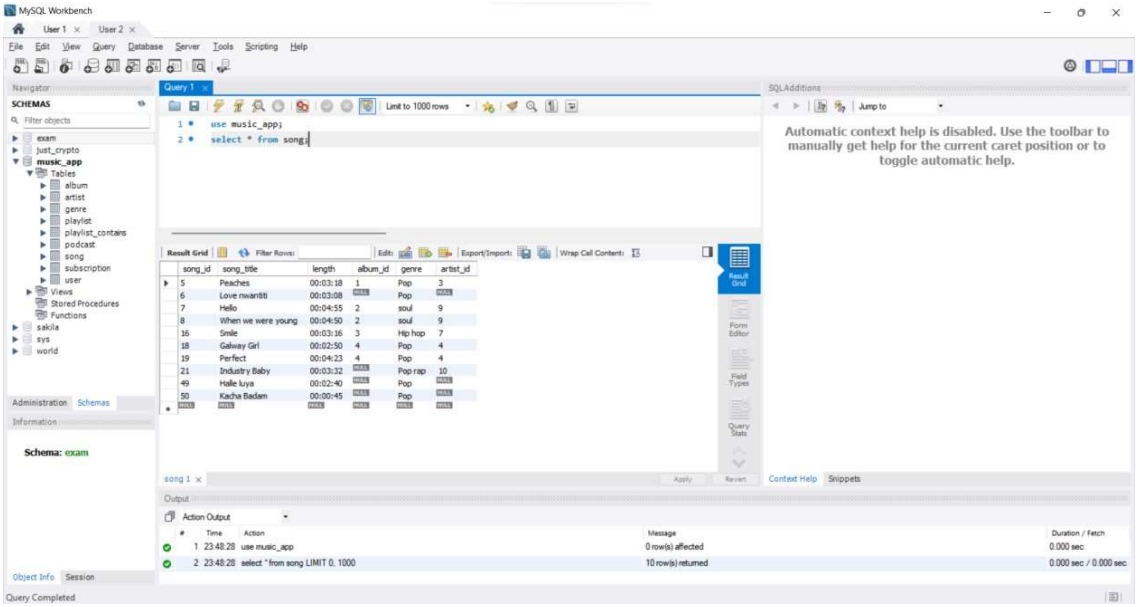
    a. User 1 reads from table song



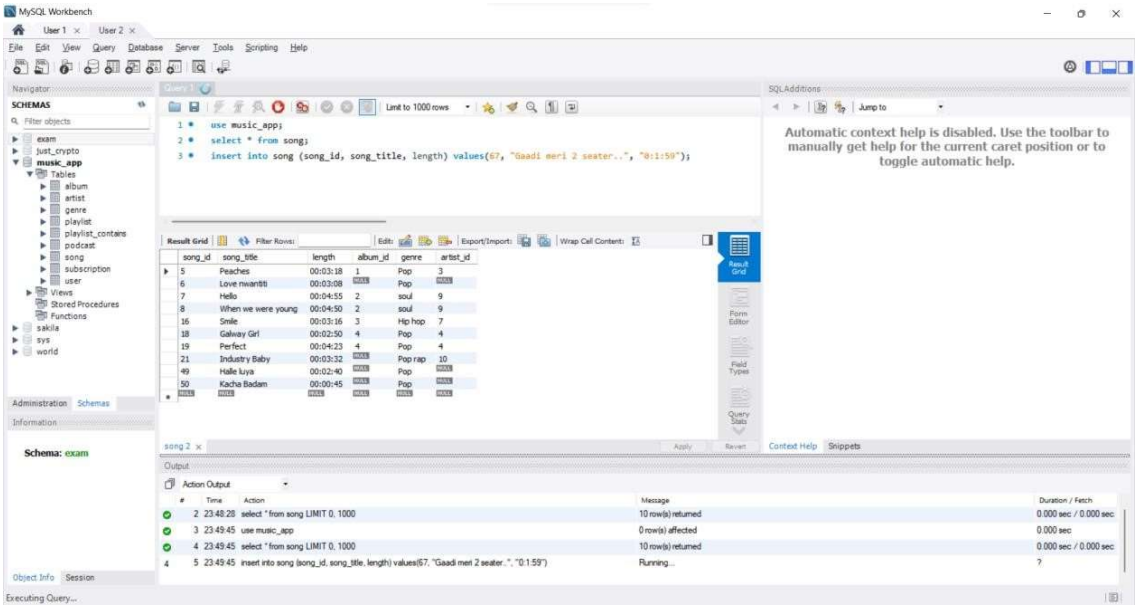
    b. User 1 writes in the song table



c. User 2 reads from the table song

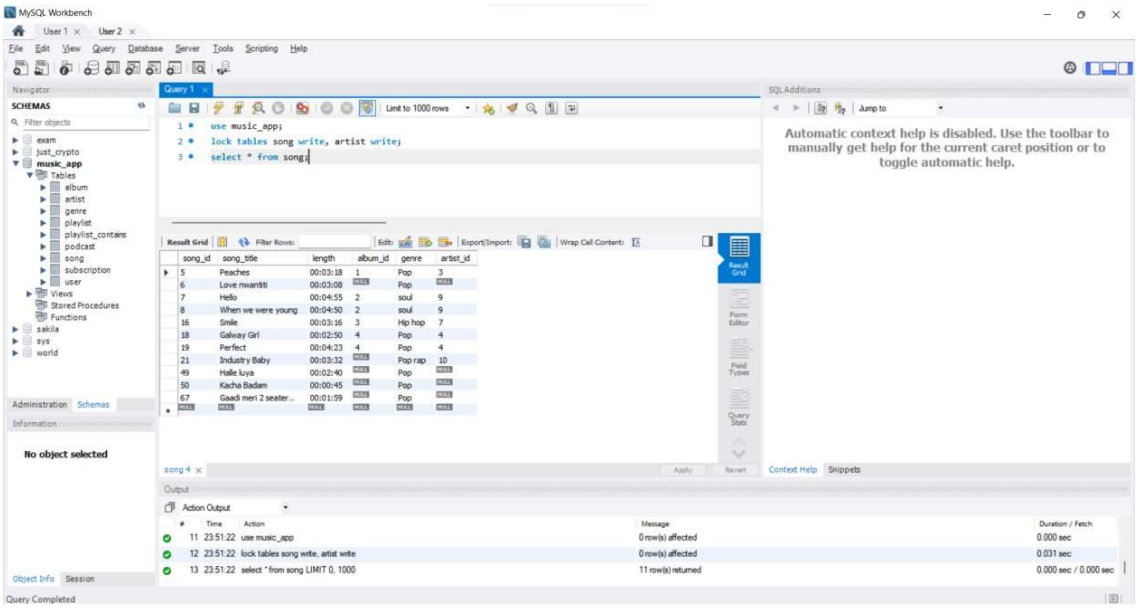


d. User 2 writes in table song

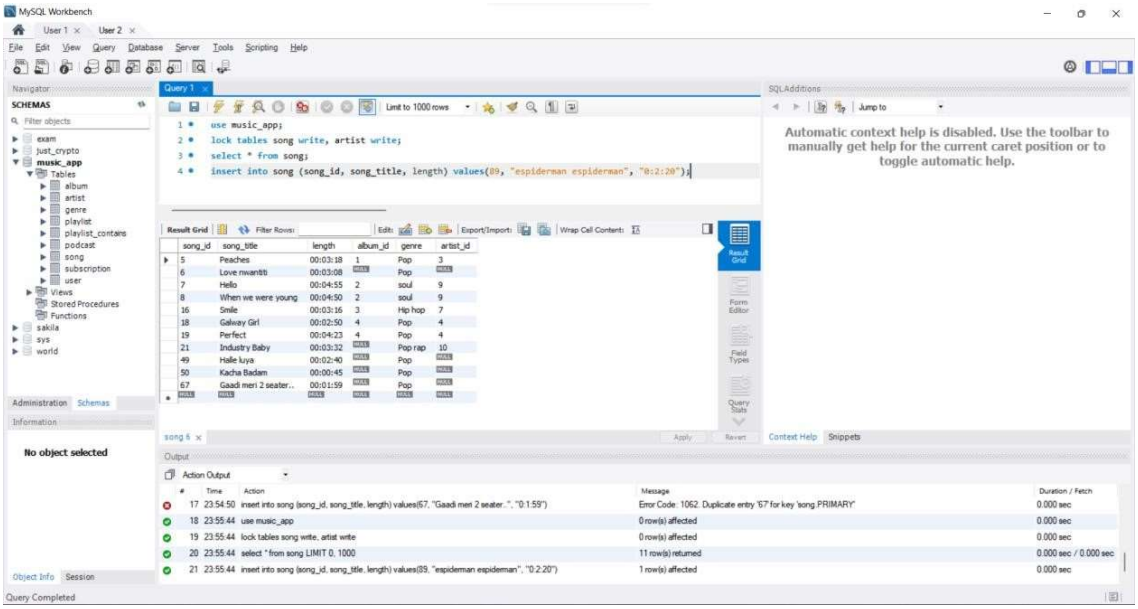


2. User 1 acquires write lock

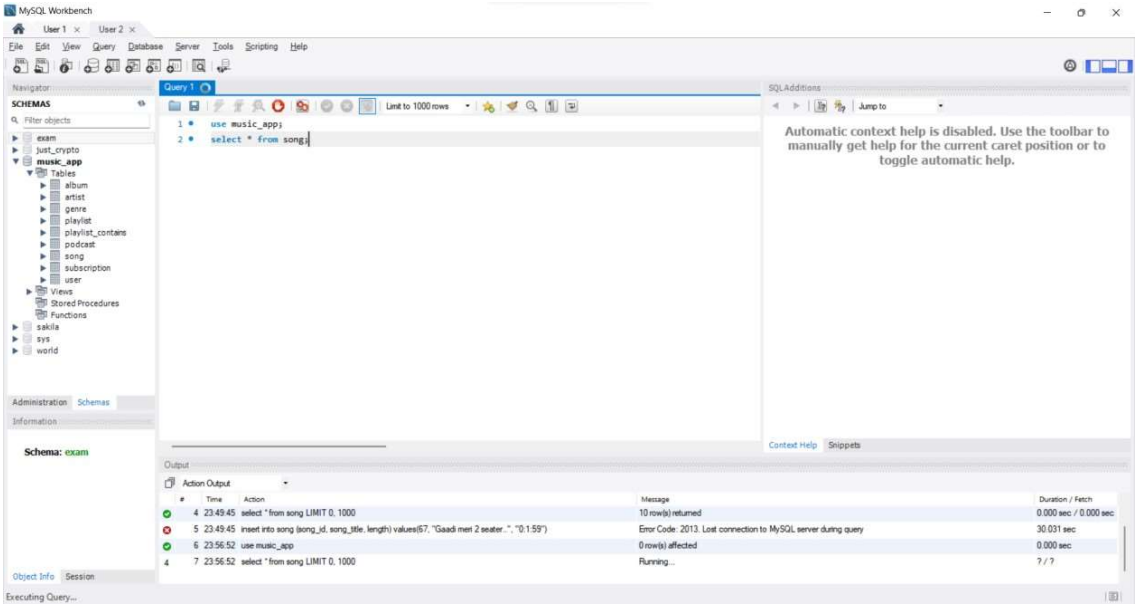
a. User 1 reads from table song



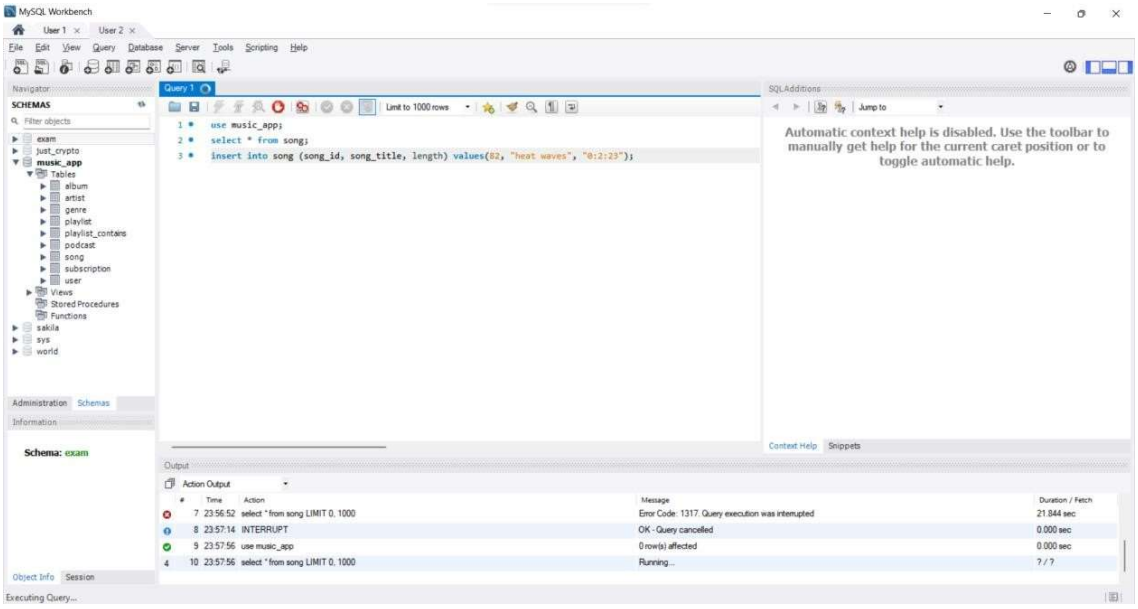
b. User 1 writes in table song



c. User 2 reads in table song



d. User 2 writes in table song



Conclusion:

Locks of mysql is used to demonstrate concurrency.