

Project1

Two Phase Locking Protocol using wait die

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Programming Language Used: java

Input: input.txt

Output :output.txt

Code Description:

The code is written to implement 2 phase locking protocol with wait-die.

The code consist of 3 classes.

- 1) Transaction
- 2) LockTable
- 3) TwoPhaseLock

The transaction and LockTable classes are used for implementing the Transaction table and lock table respectively. It holds the fields of the tables and is used as the value for the HashMap.

The TwoPhaseLock class has the following functions:

- 1) CreateTransaction
- 2) readItem
- 3) writeItem
- 4) endTransaction
- 5) abortTransaction
- 6) unlockItem

First it reads the input from the "input.txt" file and stores it in the List. It processes each item of the list.

createTransaction:

Whenever the character b is encountered, create transaction function is called to start the transaction.

readItem:

Its checks if the item is locked, if not new entry is made in the lock table for that item. Else it checks if it is conflicting operation, if so it uses the wait die protocol and checks the timestamp of each transaction and aborts the transaction if it is younger else it is made to wait.

writeltem:

Its checks if the item is locked, if not new entry is made in the lock table for that item. Else it checks if it is conflicting operation, if so it uses the wait die protocol and checks the timestamp of each transaction and aborts the transaction if it is younger else it is made to wait. Lock upgrade is done when the condition lock upgrade is satisfied.

endTransaction:

Whenever the character 'e' is encountered, the system gives call to endTransaction function , where it checks the state and if it is active changes it to commit and calls the unlockitem function.

abortTransaction:

It changes the state of the transaction to aborted and ignores all the subsequent operations and calls the unlockItem function.

unlockItem :

whenever a call is given to this function the transaction holding the locks is released for all the items it is holding. It accordingly updates the transaction table and the lock table and according to the order it awakens the pending transactions.

Note:

When a transaction is aborted its subsequent operations are ignored.

When a transaction is blocked, its operations are added to pending_operations list in transaction table.

Display functions are used to print output in the output file.

The **Output.txt** file contains the actions taken for each operation and the updates made to the transaction and lock table.

Step to run the program:

Import the project in eclipse and run from the TwoPhaseLock class as java application.