**CSE 5331**

**DBMS MODELS AND IMPLEMENTATION – 2019 Summer**

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**Project 1**

**Wound Wait Implementation.**

**DataStructure Used:HashMap**

**Used Java for Implementation.**

Explanation.

There are two hash table one is for transaction table and one is for lock table.

TransactionTableMap: This keeps track of the transaction .It has transaction Id as the key and the value as whole transaction object.

TransactionObject has three things: transactionId, Timestamp,and the state i.e Active , Blocked ,Aborted or Commited.

LockTableMap keeps track of the dataitems(X,Y or Z) and their locks . It has Dataitem as a key and Lock object as the value.

Lockobject has three attributes : DataItem , LockState(Read Lock or WriteLock) and WriteTransactionId. If there are multiple read operations then ArrayList is Used to hold the read operations.

**Main Method:**

So as the main method is called initially the program would read file character by character .So if b is encountered begin method is called .

If r or w is encountered request method is called.

If e is encountered transaction ReleaseLock Method is called.

**Begin Method**

Timestamp inscreases by 1 . The transaction goes to Active state and the entry of the transaction has been made into TransactionTableMap.

**RequestMethod**

This method checks if the Transaction Is Active, Aborted ,Blocked(Waiting ) or aborted based on transactionid .

**ActiveMethod:**

This method is called if the transaction is in Active state.

This method checks in the locktable if the there is already a lock on the DataItem or it has no lock.

If there is no lock then it makes an entry into LockTableMap . Else based on upon the operation the method is called.For eg.If there is read lock on Y and again there is different or same transaction that wants readlock then read read is called.

**Read-Read method.**

As we know there won’t be any conflict so we just add the lock and data item in the lock table with the “Read” as the lock state .Also the dataItem is added into Transaction table.

**Read-Write or Write-Read.**

If there is already a read lock on the item and this will make changes in the lock table and add data item in the transaction table and update the transaction table if the state of any of the transaction has changed. The lock table will be update like this: Before we write any transaction we need to check the status of the transaction • If the state is active then we will check if this dataItem is present in the lock table or not. If the Item is present then check the state if state == “read” If only one transaction present upgrade the lock to write else check the timestamp of the transactions and apply wound-wait concept if state==”write” then check the timestamp of the transactions and apply the wound-wait concept if the datatItem is not present then we will make the entry in the table.

**Write-Write**

If there is already a write lock and again the transaction the transaction demands the writelock we check for the timestamp and based upon the wound-wait concept we decide whether the transaction would be in Aborted state or Waiting state.

**BlockMethod**

In this basically the items are added into waiting list of the lock table .Also the same transaction is added into Transaction table.

**ReleaseItem**

This method is called when e is encountered.Here the transaction holding the locks are removedAlso Here the locks are removed from the waiting list of the lock table and they acquire lock by calling aquireLocks

**AcquireLocks**.

This method is called if the waiting operations are in lock state and they acqire the locks and change the transaction state from blocked to active

How to run

Install Java.

Add java to the envioremental path.

In CMD write Mainfile.java and you can see the output in cmd itself

References:

**Google.com**

**GeeksforGeeks.com**

**GITHUB.Com**