

Assignment 7

Transaction Chopping

Database Management and Tuning

Start date: Jan 12, 2016

Due date: Jan 25, 2016, 12:00

Grading: 1 point

In this assignment you will tune concurrent transactions by chopping them without trading in serializability.

1. A bank has two tables, `Account(accountID,branch,a_balance)` which stores accounts with their branch and their balance, and `Branch(branch,b_balance)` which stores the balance of each branch.

The following types of transactions run concurrently:

- T_1 : Add money to an account and update the corresponding branch balance. No two transactions add money to the same account.
- T_2 : Read an account balance.
- T_3 : Compare the balance of each branch with the sum of the account balances in that branch.

- (a) Give the SQL queries (including pseudo code if necessary) for each transaction.
- (b) Model all transactions with read/write operations.
- (c) Show the chopping graph and give the finest possible correct chopping.
- (d) How does the chopping change if two concurrent transactions of type T_1 can update the same account? Explain.
- (e) The order of the atomic operations in T_3 has an impact on the chopping. Show two semantically equivalent implementations of T_3 , one which favors chopping, the other which does not favor chopping. Explain.

2. Given the following transactions:

- T_1 : $R(a), R(b), W(b), R(e)$
- T_2 : $R(b), R(e)$
- T_3 : $R(a), W(a), R(e)$
- T_4 : $R(a), W(c)$
- T_5 : $R(c)$
- T_6 : $R(c), W(d), W(c), R(b)$

Find the finest chopping for the concurrent execution of the following transactions and show the respective chopping graphs.

- (a) all transactions (i.e., $T_1, T_2, T_3, T_4, T_5, T_6$)
- (b) all transactions except T_4 (i.e., T_1, T_2, T_3, T_5, T_6)

Please indicate the time that you spent solving this assignment in your report. The time that you indicate will have *no* impact on your grade.