

Concurrency examples

A

Assume no locks are used. What problem occurs?:

(solution below)

Transaction 1
(reports total of X, Y, and Z)

$a = \text{read}(X)$

$b = \text{read}(Y)$

$c = \text{read}(Z)$

$\text{print}(\text{"Total is"}, a+b+c)$

Transaction 2
(transfers from X to Y
and from Y to Z)

$\text{write}(X, X-10)$

$\text{write}(Y, Y+10)$

$\text{write}(Y, Y-50)$

$\text{write}(Z, Z+50)$

B

Assume 2PL is used. What problem occurs?

(solution below)

$T_x(1)$
(transfer from X to Y)

$\text{write}(X, X-50)$

$\text{write}(Y, Y+50)$

commit

$T_x(2)$
(transfer from Y to Z)

$\text{write}(Y, Y-10)$

$\text{write}(Z, Z+10)$

commit

$T_x(3)$
(transfer from Z to X)

$\text{write}(Z, Z-20)$

$\text{write}(X, X+20)$
commit

Solution to (A) : This is inconsistent analysis, because an invalid value of X is used to compute the total.

Solution to (B) : This is a dead lock. We obtain

