

(a) Consider these three transactions:

- $T_1 : R_1(A), R_1(B), W_1(A), W_1(B), Co_1$
- $T_2 : R_2(B), W_2(B), R_2(C), W_2(C), Co_2$
- $T_3 : R_3(C), W_3(C), R_3(A), W_3(A), Co_3$

i. Schedule 1:

$R_2(B), W_2(B), R_3(C), W_3(C), R_3(A), W_3(A), Co_3, R_2(C), W_2(C), Co_2, R_1(A), R_1(B), W_1(A), W_1(B), Co_1$

Is this schedule conflict-serializable? If yes, indicate a serialization order.

Solution: yes: 3,2,1

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1 <--B-- 2 <--C-- 3
^          |
+-----A-----+

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ii. Schedule 2:

$R_2(B), W_2(B), R_3(C), W_3(C), R_1(A), R_1(B), W_1(A), W_1(B), Co_1, R_2(C), W_2(C), Co_2, R_3(A), W_3(A), Co_3$

Is this schedule conflict-serializable? If yes, indicate a serialization order.

Solution: no

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1 <--B-- 2 <--C-- 3
|          ^
+-----A-----+

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(b) Consider the following three transactions:

- $T_1 : R_1(A), W_1(B), Co_1$
- $T_2 : R_2(B), W_2(C), Co_2$
- $T_3 : R_3(C), W_3(D), Co_3$

Given an example of a conflict-serializable schedule that has the following properties:
transaction T1 commits before transaction T3 starts, and the equivalent serial order is T3, T2, T1.

Solution: R1(A), R2(B), W1(B), Co1, R3(C), W2(C), Co2, W3(D), Co3

Variations include: swap the first two reads (of A and B), and the last two writes (of C and D, together with the commit order)