

Concurrency
control:
assume that all
individual actions
are correct



When we swap
read/write/commit
operations in schedules

- we will never permit
swaps that change the
order of operations
within an individual
transaction in the schedule



A pair of R/W operations
is a conflicting pair if:

(1) these operations are on the
same data item

AND

(2) they are by different
transactions

AND

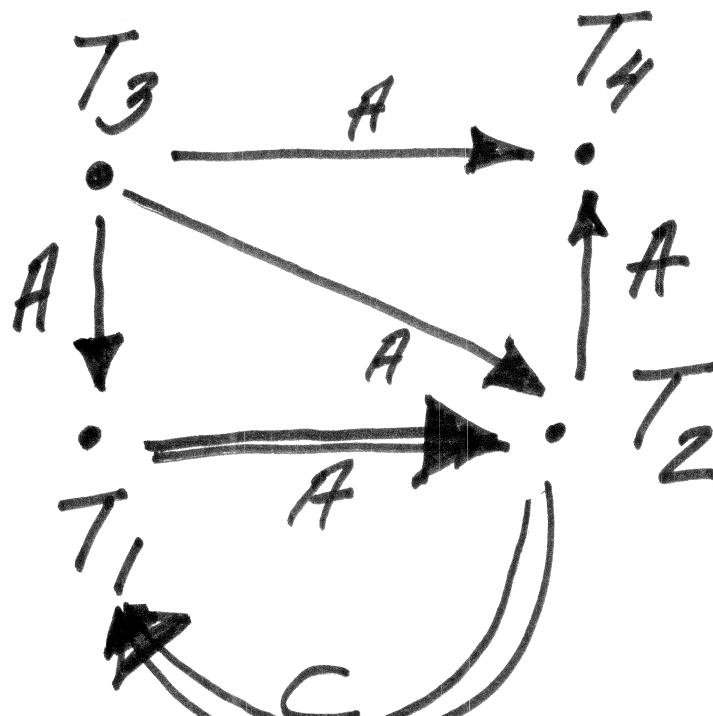
(3) At least one of the operations
is a write



Schedule S of slide 18:

$$\begin{array}{c} S = \underline{w_3(A)} \underline{w_2(C)} \underline{r_1(A)} \underline{w_1(B)} \underline{r_1(C)} \\ \hline \underline{w_2(A)} \quad \underline{r_4(A)} \quad \underline{w_4(D)} \end{array}$$

- ✓ A: $\underline{w_3(A)}$ $\underline{r_1(A)}$
 $w_2(A)$ $r_4(A)$
- ✓ B: $w_1(B)$
- ✓ C: $w_2(C)$ $r_1(C)$
- ✓ D: $w_4(D)$

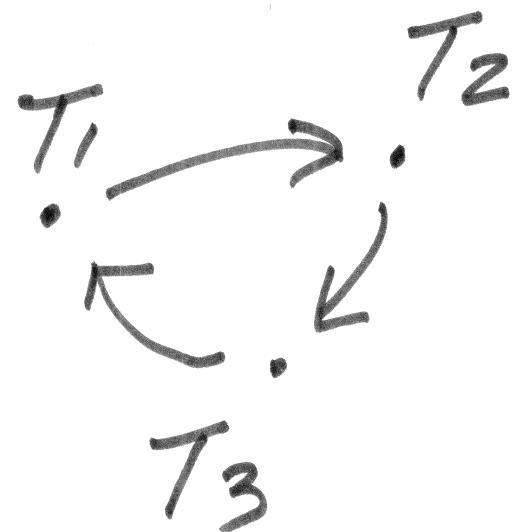


Assignment for extra credit
 due end of day
 Saturday April 18

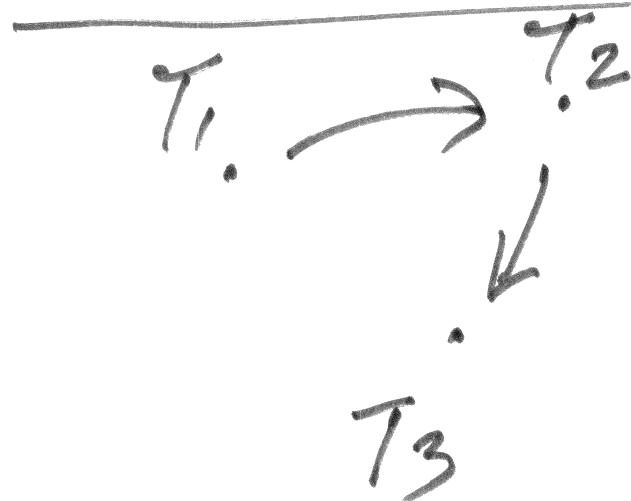
S: $R_1(A) R_2(A) R_3(B) W_1(A)$
 $R_2(C) R_2(B) W_2(B) W_1(C)$

- submit the precedence graph for
- is conflict serializable?
- what are all the conflict-equivalent serial schedules?

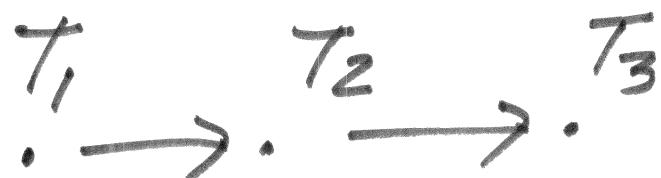




cycle \Rightarrow
 \emptyset conflict
 equivalent
 serial schedules



no cycle \Rightarrow



$\Rightarrow T_1, T_2, T_3$ is
 the only confl -
 equiv serial schedule



$T_1 \xrightarrow{\cdot} T_2$

T_3

no cycles \Rightarrow
 $T_1 \xrightarrow{\cdot} T_2 \xrightarrow{\cdot} T_3$

