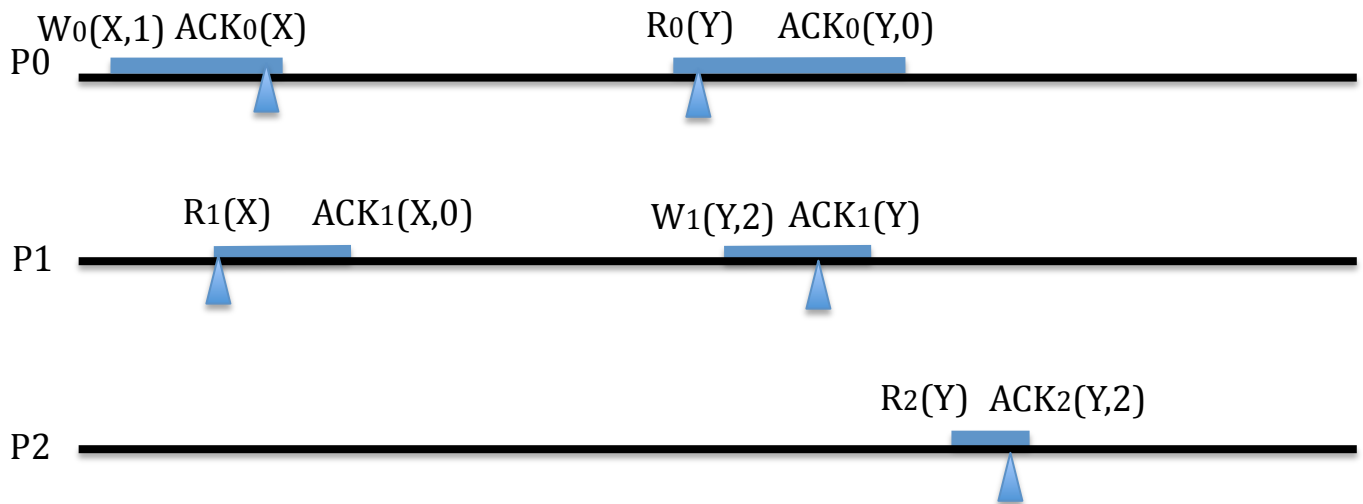


CS 425/ECE 428 Distributed Systems
Homework 3
Due by 7 p.m. on February 19, 2016
Submit electronically via Compass2g.

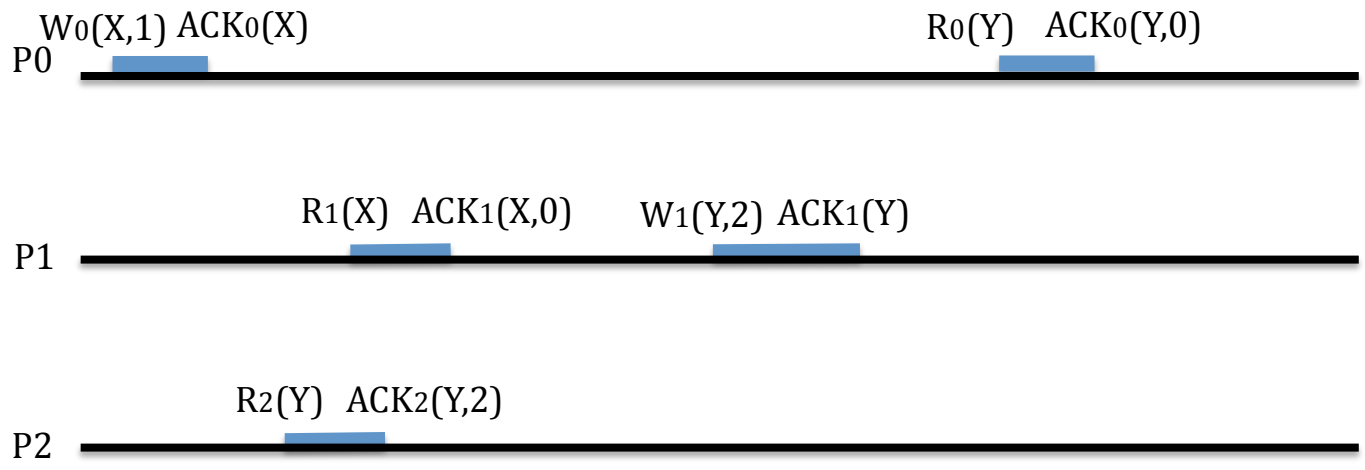
1 In each part of this question, if you answer NO, then delete a minimum number of operations to ensure that the modified execution will satisfy the specified property – circle the operations that you want to delete.

Assume that all variables are initialized to 0.

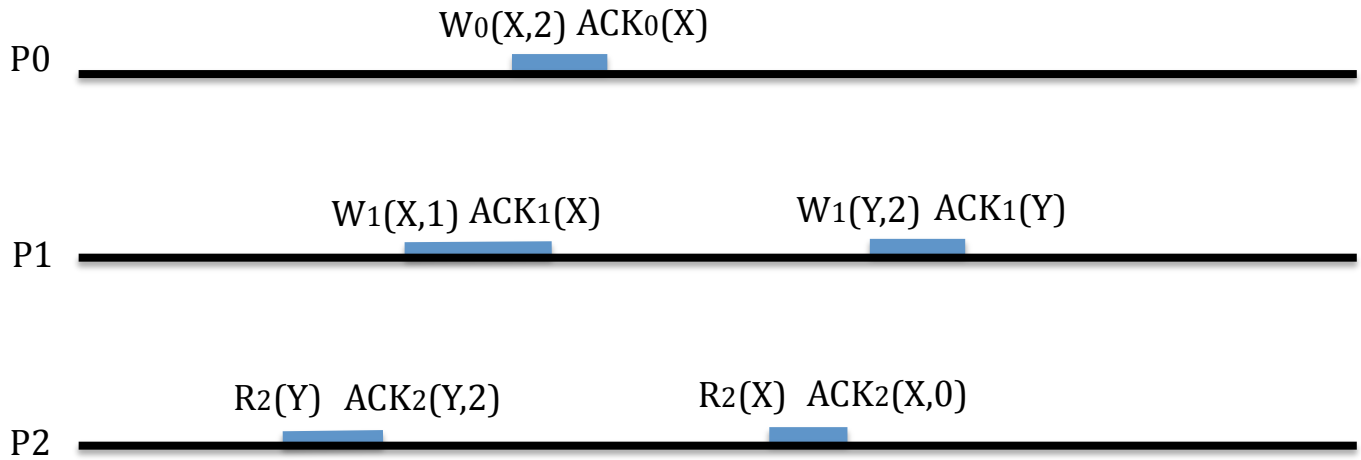
(a) Is the execution below linearizable? **Yes. Linearization points are shown (although the question did not ask for these)**



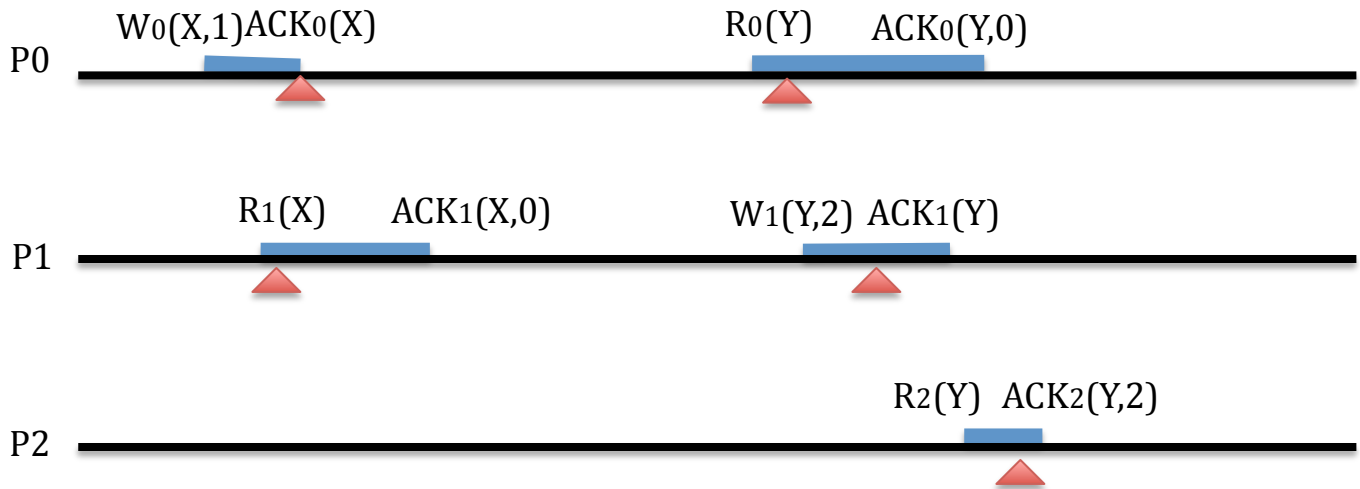
(b) Is the execution below sequentially consistent? **Yes**



(c) Is the execution below sequentially consistent? **No.** Circle either $R_2(Y)$ or $R_2(X)$ at process P2



2 Given below is a linearizable execution, please draw linearization points (as triangles) for each of the operations.



3 Please state True or False:

(a) Algorithm 2 discussed in the class notes on shared memory guarantees linearizability. **False**

(b) Algorithm 3 discussed in the class notes on shared memory guarantees sequential consistency. **True**

(c) Algorithm 1 discussed in the class notes on shared memory does not guarantee sequential consistency. **True**

(d) Every linearizable execution is sequentially consistent. **True**

(e) Every sequentially consistent execution is linearizable. **False**