Concurrent Algorithms 2009: Exercise 9

November 23, 2009

1 Problem 1

Each of the following executions represents an interleaving of transactions executed by a *Transactional Memory* object. For each execution:

- Specify whether it is *opaque* or not.

- If it is not, suggest a modification to make it *opaque*.

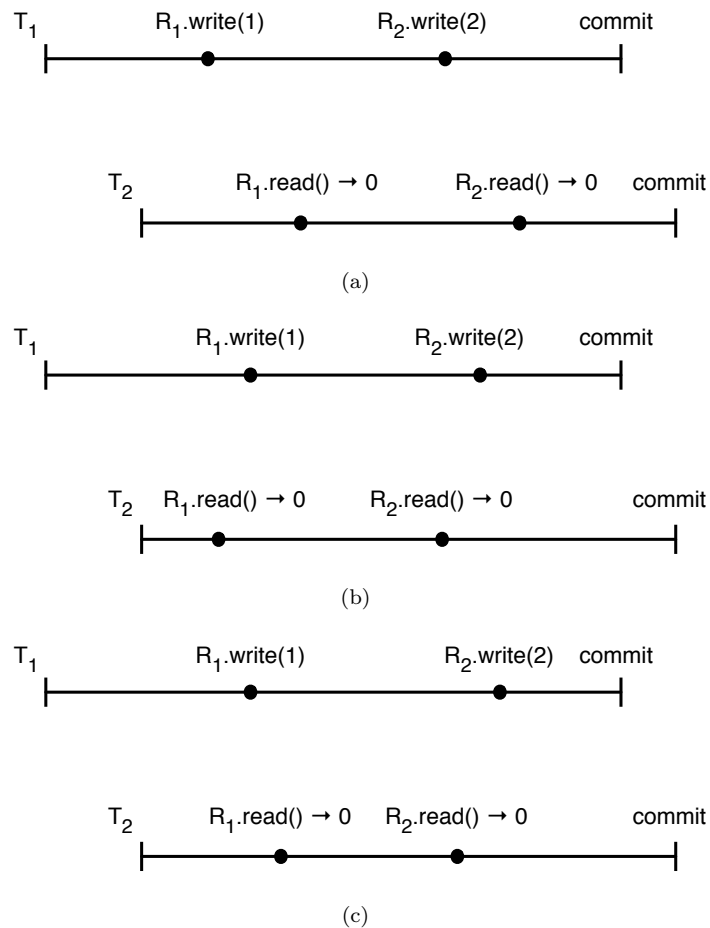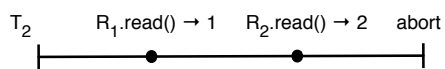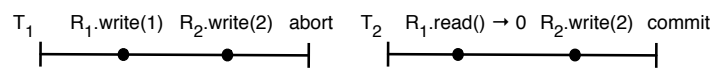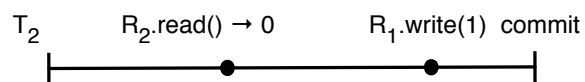- Specify an equivalent serial execution of transactions.

(a)

(b)

(c)

Figure 1: Transactional executions (part 1)

T_1 R_1.write(1) R_2.write(2)   abort T_2 R_1.read() $\rightarrow$ 0 R_2.write(2)   commit

T_2 R_1.read() $\rightarrow$ 1 R_2.read() $\rightarrow$ 2   abort

(a)

T_1 R_1.read() $\rightarrow$ 0 R_2.write(1)   commit

T_2 R_2.read() $\rightarrow$ 0 R_1.write(1)   commit

(b)

T_1 R_1.read() $\rightarrow$ 0 R_2.write(1)   abort

T_2 R_2.read() $\rightarrow$ 0 R_1.write(1)   commit
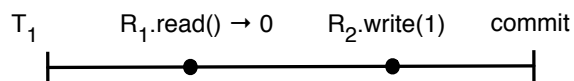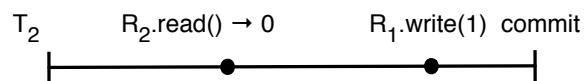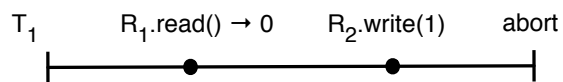
(c)

Figure 2: Transactional executions (part 2)