Concurrent Algorithms November 17, 2015

Exercise 8

Problem 1. Devise an obstruction-free, anonymous algorithm that implements binary consensus using a *finite* number of (unbounded) counters.

Reminder: a counter object implements two operations: *inc*, which increments the value of the counter and returns *ok*, and *read*, which returns the current value of the counter.

Problem 2. Assume the non-responsive base objects model in which a process can execute several operations on base objects concurrently. In other words, a process does not have to wait for a response of its current operation on a base object to invoke another operation on a base object. Is it possible to implement a SWMR atomic register using (any number of) base SWMR atomic registers of which t can be non-responsive?

Problem 3. Assume the non-responsive base objects model in which a process can execute several operations on base objects concurrently. In other words, a process does not have to wait for a response of its current operation on a base object to invoke another operation on a base object. Is it possible to implement a consensus object using (any number of) base C&S objects of which t can be non-responsive?