York University | COSC6117 | March 18, 2002

Homework Exercise
Due: April 1, 2002

8. Consider the problem of implementing a single-writer multi-reader (swmr) register from single-writer single-reader (swsr) registers. (All objects are linearizable, and the implementation is wait-free.) We proved in class that a process simulating a READ operation on the swmr register must write to a swsr register at some point. Use similar ideas to give a careful proof of a lower bound on the space complexity of this problem. I.e. give a function f such that *every* implementation for n processes must use at least $f(n)$ swsr registers. Your bound should be as tight as you can make it.

Note that since processes doing READs of the swmr register are allowed to write to swsr registers now, you cannot simply insert a READ into an execution and assume that other processes will not notice it, as we did in class.