

Homework Assignment #7

Due: December 5, 2016

1.

Consider an asynchronous shared-memory model where any number of processes may crash. Algorithms must be wait-free.

Let f be a function. In the adaptive $f(k)$ -renaming problem: the processes are given distinct natural numbers as inputs, and, for all k , in every execution in which k processes take steps, all non-faulty processes must output distinct values in the range $\{1, \dots, f(k)\}$.

In class we will see an algorithm for adaptive $(2k - 1)$ -renaming.

- (a) Prove that adaptive k -renaming is impossible using only registers. Hint: Your answer can be very short.
- (b) Give a really simple k -renaming algorithm using compare-and-swap objects.