

Problem Set 4, Part b

Due: Thursday, November 5, 2009

Reading:

Chapter 9 (skim); Sections 10.1-10.8 in detail, 10.9 (skim)

Reading for next week:

Herlihy-Shavit book, Chapter 7;
Mellor-Crummey and Scott paper;
Magnussen, Ladin, and Hagersten paper (optional); Chapter 11 (skim); Chapter 12

Problems:

1. Exercise 10.3.
2. Exercise 10.13. In writing your code, you may use pseudocode in the style used on p. 284, Tempo-style pseudocode like that on p. 285-286, or real Tempo code.
3. Exercise 10.22.
4. Use techniques like those in Section 10.8 to prove that 3 processes cannot solve the 2-exclusion problem using just a single read/write shared variable.

The 2-exclusion problem is defined in Exercise 10.13. Thus, we assume a new exclusion condition, which says that no more than 2 processes can be in the critical region at the same time. Also, we assume a new progress condition, which guarantees that, if the critical region is occupied by at most one process, then another trying process must eventually enter the critical region. We do not assume any high-level fairness condition.

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