

Problem Set 3, Part a

Due: Thursday, October 20, 2005

Reading:

Chapter 8. Chapter 14 (skim). Chapter 15.

Reading for next week: Chapters 16 and 18.

Problems:

1. Exercise 8.8.
2. The standard FIFO reliable channel automaton $C_{i,j}$, defined on p. 204, can itself be regarded as an “optimized version” of another automaton $C'_{i,j}$, which keeps track in its state of the entire history of messages that have been sent. C' also maintains a pointer that indicates the last message that has been delivered.
 - (a) Write I/O automaton pseudocode for $C'_{i,j}$. (You should check your code using the TIOA front-end.)
 - (b) Prove that $C_{i,j}$ implements $C'_{i,j}$, in the sense that $traces(C_{i,j}) \subseteq traces(C'_{i,j})$, using a simulation relation.
 - (c) Is it also true that $C'_{i,j}$ implements $C_{i,j}$, in the same sense? If so, give a simulation relation to demonstrate this implementation relationship; you do not need to prove that it is in fact a simulation relation. If not, then show a counterexample.
3. Exercise 15.7. (You should check your code using the TIOA front-end.)
4. Exercise 15.12.
5. Exercise 15.27.