

Modeling Concurrent and Probabilistic Systems

Winter Term 07/08

– Series 5 –

Hand in until November 23 before the exercise class.

Exercise 1 (4 points)

Use the partitioning algorithm as introduced in the lecture to show that the two specifications of the two place buffer are both weakly bisimilar and observationally congruent!

Exercise 2 (6 points)

Prove the following characterization of weak bisimilarity in terms of observational congruence:
For every $P, Q \in Proc$,

$$P \approx Q \iff P \simeq Q \text{ or } P \simeq \tau.Q \text{ or } \tau.P \simeq Q.$$

Exercise 3 (4 points)

Show that it is generally undecidable whether two given processes are weakly bisimilar or not!

Hint: This can be done by providing a reduction from the halting problem of Turing machines to the bisimilarity problem, employing the construction from Exercise 4.2.