SS 2014 09.07.2014

Exercises to the lecture
Concurrency Theory
Sheet 12

Roland Meyer, Viktor Vafeiadis Delivery until 15.07.2014 at 12h

For the assignments on this sheet, consider boolean programs without local variables. Thus, memory accesses can read and write only the values 0 and 1. Further assume there is a *compare-and-swap* action $\mathrm{cas}(x, 0/1, 0/1)$ that checks if address x contains the first value and – if so – replaces it with the second.

Exercise 12.1

a) Reduce SC-reachability for parametrized programs to the coverability problem for Petri nets.

b) Show that SC-reachability is in EXPSPACE.

Exercise 12.2

a) Reduce the coverability problem for Petri nets SC-reachability for parametrized programs.

b) Conclude that SC-reachability is EXPSPACE-complete.

Exercise 12.3

a) Sketch an algorithm that solves the *fence computation problem*: given a program, compute a minimal set of labels so that the program is robust if fences are inserted at these labels.

b) Show that the fence computation problem is PSPACE-complete.

Delivery until 15.07.2014 at 12h into the box next to 34-401.4