Applied Automata Theory (SS 2011) Out: Wed, June 1 Due: Wed, June 8

Exercise Sheet 7

Jun.-Prof. Roland Meyer, Georg Zetzsche Technische Universität Kaiserslautern

Exercise 7.1

Search the WWW to find four model checking tools. For each of them, describe in one or two sentences which system models and what kind of specifications are supported.

Exercise 7.2

Let $\mathcal{P}$ be a set of propositions with $P, Q, R \in \mathcal{P}$ and $\Sigma = \mathbb{P}(\mathcal{P})$. Present an LTL-formula that defines the language of all $w \in \Sigma^\omega$ such that

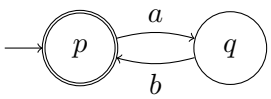
- each position in which P holds is eventually followed by one in which R holds and
- among those positions that lie in between (including the one with P and the one with R), there is exactly one in which Q holds.

Exercise 7.3

In the lecture, it was shown how to reduce the inclusion problem for NBA to the universality problem. Present a detailed definition of the automaton C, for which there is only an informal description in the lecture notes.

Exercise 7.4

In the lecture, you learned about the universality test for Büchi automata by Fogarty and Vardi. Use it to check whether the following NBA accepts $\{a, b\}^\omega$.



Remember that, in Exercise 6.2, you probably already calculated the equivalence classes for $\sim_A$.