Formal Models SS 2017: Assignment 2

Institute for Formal Models and Verification, JKU Linz

Due 23.03.2017

Exercise 5

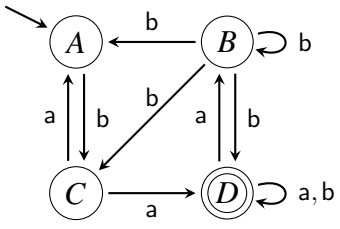
Given an automation A with state $S = \{A,B,C,D\}$, alphabet $\Sigma = \{a,b\}$, initial states $I = \{A,C\}$, the final states $F = \{B,D\}$, and transitions
$T = \{(A,a,B),(A,a,C),(B,a,B),(C,a,C),(C,b,D),(D,b,D),(D,a,B)\}$. Draw the power automaton $\mathbb{P}(\mathsf{A})$ for FA A. What is the maximum number of states $\mathbb{P}(\mathsf{A})$ can have in theory? Justify your answer.

Exercise 6

Draw the automaton K, which describes exactly the complement language described by the automaton of Exercise 5.

Exercise 7

Given FA A where $\Sigma := \{a,b\}$ as shown on the right. Draw the oracle-automaton $Oracle(A)$ as defined on lecture slide 8. For making $Oracle(A)$ complete by introducing an error state, how many new transitions have to be added?



Exercise 8

Given FA A from the previous exercise, draw the *optimized* oracle-automaton $Oracle(A)$. Is $Oracle(A)$ complete? Is it deterministic? Justify your answer.