

Group: _____

Assignment 2

Name: _____

Formal Models

Matr.Nr.: _____

Summer Semester 2010

Points: _____

Due: 18.03.2010 08:30

Institute for Formal Models and Verification, Dr. Robert Brummayer, Dipl.-Ing. Florian Lonsing

Exercise 5

Draw an FA A with input-alphabet $\Sigma := \{a, b\}$ having *exactly* 2 states such that...

- a) ... A is non-deterministic and incomplete.
- b) ... A is deterministic and incomplete.
- c) ... A is non-deterministic and complete.
- d) ... A is deterministic and complete.

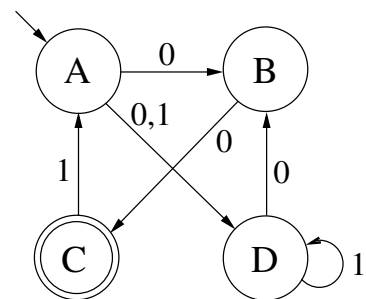
Exercise 6

Describe in your own words the formal definition of the sub-set construction (power automaton), including all of its components. Explain the following propositions (see also lecture slide 6):

- a) Given an FA A , the power automaton $\mathbb{P}(A)$ is *always* deterministic.
- b) Given an FA A , the power automaton $\mathbb{P}(A)$ is *always* complete.

Exercise 7

Draw the power automaton $\mathbb{P}(A)$ for FA A as shown on the right. What is the maximum number of states $\mathbb{P}(A)$ can have in theory? Justify your answer.



Exercise 8

Draw an FA A with $\Sigma := \{a, b\}$ having *at least* 3 states such that $L(C(A)) \neq \overline{L(A)}$, where $C(A)$ denotes the complement-automaton of A . Explain your solution.