Group: _____ Assignment 4

Name: _____ **Formal Models**

Matr.Nr.: _____ Summer Semester 2010

Points: _____ **Due: 15.04.2010 08:30**

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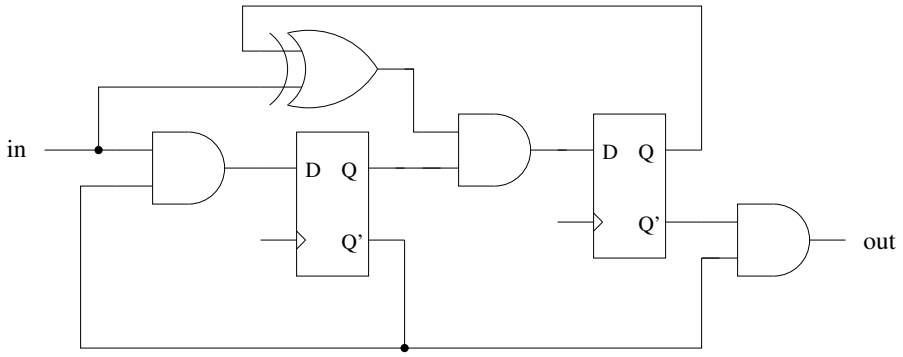
Exercise 13



Draw an I/O-automaton modelling the digital circuit shown above. Use $\Sigma := \Theta := \{0,1\}$ as input- and output-alphabet.

Exercises 14

The article *Regular Expression Matching Can Be Simple And Fast*[1] describes a real-world application of automata theory [2]. Read it from the beginning up to (and including) section "Regular Expression Search Algorithms". You may skip the remaining parts except section "Performance". Summarize the main facts, while concentrating on the problem described, the suggested approaches, and if/why one approach is superior than the other.

Exercises 15

Draw a graphical representation for the PA-System $P = b.(b.R + a.Q)$, $Q = c.a.Q + b.R$, $R = b.P + b.c.R$. As demonstrated in the lecture, show that action $Q \xrightarrow{b} R$ can be executed by subsequently applying the semantical rules of PA.

Exercises 16

Like Exercise 15, but for PA-System $P = Q \,||\, R$, $Q = a.b.t.Q$, $R = d.t.R + c.R$ and action $P \xrightarrow{c} P$.

[1] `http://swtch.com/~rsc/regexp/regexp1.html`
[2] `http://code.google.com/p/re2/`