Homework for lecture
Automata and Formal Languages II

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SS 2015 | Homework Sheet 1 | 14.04.2014

Submission: Before tutorial in the week from Apr 20 – Apr 24

Note: The date for the tutorials is not yet fixed, and will be published on the lectures homepage `http://www21.in.tum.de/~lammich/2015_SS_Automata2/`

Aufgabe 1.1. [**Tree Automata**] (10 points)
Define tree automata to recognize the following languages:

1. Expressions over natural numbers (0, Suc) and operators $+, *$ that evaluate to odd numbers. Hint: Be careful with multiplication by zero.
2. Expressions over true, false, and operators $\wedge, \neg$ that are true.
3. Lists of pairs of natural numbers (use the alphabet 0/0, Suc/1, Nil/0, Cons/2, Pair/2)

Aufgabe 1.2. [**Epsilon Rules**] (10 points)
Consider removal of ε-rules from the lecture. Complete the proof that $L(\mathcal{A}) = L(\mathcal{A}')$, i.e., show that

$$t \to_{\mathcal{A}'} q \implies t \to_{\mathcal{A}} q$$