

Faculty of Computer Science Institute for Theoretical Computer Science, Chair for Automata Theory

# **Selected Topics in Automata and Logic**

## **Exercise Sheet 12**

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#### Notice

The solutions to Exercise 3 and 5 from Exercise Sheet 11 will be discussed during this week's tutorial session.

## Exercise 1

For a tree *t* over the alphabet  $\Sigma = \{a, b\}$  let t(1) and t(2) denote the subtrees of *t* that are rooted in the nodes 1 and 2, respectively (provided that they exist). Let  $L_{\neq}$  be the language of all trees *t* where t(1) and t(2) exist and  $t(1) \neq t(2)$ .



Give a 2-TWA (without pebbles) that accepts  $L_{\neq}$ .

# Exercise 2

Let L be the language of all trees over  $\Sigma = \{a, b\}$  such that

- no internal node is labelled with a, and
- every path to an *a*-labelled leaf contains an even number of branching nodes.

Give a 1-TWA with one pebble, that accepts  $\overline{L}$ .