TECHNISCHE UNIVERSITÄT DRESDEN

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

Introduction to Automatic Structures

Exercise Sheet 2

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Notice

This is Part 2 of this exercise sheet. A first part is also available.

Exercise 7

Let R and S be two automatic relations. The concatenation $R \circ S$ of R and S is defined as

$$R \circ S = \{(uv, u'v') \mid (u, u') \in R, (v, v') \in S\}.$$

Show that automatic relations are not closed under concatenation by providing a counterexample.

Exercise 8

Prove the following statement about automatic presentations. Let $\mathcal{A}$ be an automatic structure. Then $\mathcal{A}$ has an automatic presentation over a binary alphabet.