CS 3530: Assignment 1e

Fall 2022

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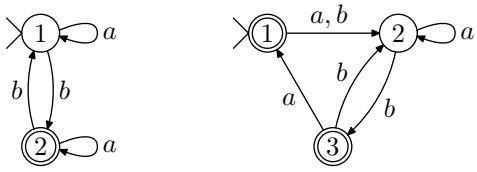
Exercise 1.21 (10 points)

Problem

Use the procedure described in Lemma 1.60 to convert the following finite automata to regular expressions. When ripping states, rip state 1 first, then state 2, then state 3.



(a) (b)

Solution

a). a*b(a∪$ba*b$)∗

b). $\varepsilon \cup ((a \cup b)a*b)((a(a \cup b)a*b)*\varepsilon \cup a)$

Exercise 1.28c (10 points)

Problem

Convert the following regular expressions to NFAs using the procedure given in Theorem 1.54. In all parts $\Sigma = \{a, b\}$. Note: a^+ is defined as aa^*, and should be constructed as the concatenation of a with a^*. Do not simplify, and do not skip steps. You only need to show the final state diagram.

c. $(a \cup bb^*)aa^*bb^*$

Solution