

CS 3530: Assignment 2b

Fall 2014

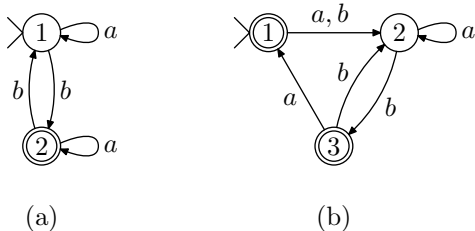
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Exercises

Exercise 1.21 (7 points)

Problem

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



Solution a

$$RE = (a)^* b(bb \cup a)^*$$

Solution b

$$RE = ((a \cup b)(a)^*(b)(bb)^*a)^*$$

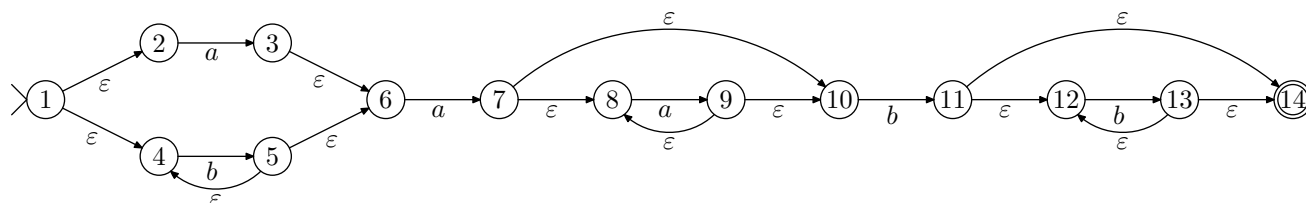
Exercise 1.28c (7 points)

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. $(a \cup b^+)a^+b^+ \equiv (a \cup bb^*)aa^*bb^*$

Solution



Exercise 1.29b (6 points)**Problem**

Use the pumping lemma to show that the following languages are not regular.

b. $A_2 = \{www : w \in \{a, b\}^*\}$

Solution