

Exercises for FLL, Fall 2015, sheet 2

Return Tue Sep 22, in class

Exercise 1. Design an ϵ -NFA that accepts the language denoted by $((\epsilon+a)bb)^*a^*$. Represent your automaton by a transition diagram.

Exercise 2. Let $\Sigma = \{0,1\}$. Prove or disprove the following two claims (L_i are language variables):

- (a) $(L_1 + L_2)^* =_{\Sigma} (L_1^* L_2^*)^*$
(b) $(L_1 + L_2)^* L_3^* =_{\Sigma} L_1 L_3^* + L_2 L_3^*$

Exercise 3. Is the language $L = \{w \in \{0, 1\}^* \mid w \text{ contains an equal number of 0's and 1's}\}$ regular? Prove your answer.

Exercise 4 [optional]. Prove that the language $L = \{0^n \mid n = pq \text{ for two primes } p, q\}$ is not regular.