

Homework 2 (NFA, Equivalence of NFA and DFA, and Regular Languages)

Due Monday, Feb 19, 07, at 3:00 PM in Class

- (1) Transform the following NFA $N = (Q, \{0, 1\}, \delta, q_0, F)$ to a DFA (it suffices to give the STD of the DFA). $Q = \{q_0, q_1, \dots, q_5\}$, $F = \{q_3, q_4\}$, and δ is as follows:

δ	0	1	ϵ
q_0	$\{q_0\}$	$\{q_0, q_2\}$	$\{q_1\}$
q_1	$\{q_5\}$	$\{q_2\}$	-
q_2	$\{q_3\}$	-	-
q_3	-	-	$\{q_4\}$
q_4	$\{q_3\}$	-	-
q_5	-	$\{q_4\}$	-

Now do only two of the following three:

- (2) Prove that every NFA can be converted to an equivalent one that has a single accepting state.
- (3) Show that $L = \{\epsilon, 0\}$ can't be accepted by an NFA N unless at least one of the following conditions is met:
- (a) N contains a transition labeled by ϵ .
 - (b) N has at least two accepting states.
- (4) Prove that if L is a regular language, then $\{x^R \mid x \in L\}$ is also regular.

Note: Next homework is on minimizing DFA.