

Com S 331
Fall 2009
Homework #4

Due Friday, September 25, at beginning of class.

25. How many NFAs $M = (Q, \Sigma, \Delta, S, F)$ are there with $\Sigma = \{0, 1\}$ and $Q = \{1, 2, \dots, n\}$?
26. Formulate and solve an NFA analog of problem 18.
27. Explain clearly why the following proof is not valid.

Claim. For every $n \in \mathbb{Z}^+$ there is an n -state NFA that is not equivalent to any n -state DFA.

Proof. Let $n \in \mathbb{Z}^+$. By problems 17 and 25, there are more n -state NFAs than n -state DFAs, so there must be some n -state NFA that is not simulated by any n -state DFA. \square

28. p. 316 problem 4.
29. p. 318 problem 9 (b).
30. p. 303 problems 1 (a,b).
31. p. 303 problems 1 (c,d).
32. Prove that every finite language is regular.