

CS 481 Homework 2

due Friday September 16

Do each problem on a separate set of pages and please remember to write your name, net-id and problem number on the top right hand corner of each page.

1. Problem 3.2.6, all four parts.
2. Problem 4.2.9.b. *Hint:* You have to somehow predict the set of reachable states from somewhere. But you also must make sure that the predictions are correct.
3. We define a new type of NFA, that we call *all*-NFA. In this, we can have non-deterministic and ε -transitions, but now, a string w is accepted only if **every** path from the start state on w leads to an accepting state. Prove that the set of languages accepted by *all*-NFA are exactly the regular languages.
4. Write out the regular expression for the following language:

$$L = \{w \mid w \in \{0, 1\}^*, \#1(w) \text{ and } \#0(w) \text{ even} \}$$

where $\#1(w)$ is the number of 1's in the string w .