

# Homework 2

CS 4313 – Spring 2003  
Tom Bylander, Instructor

assigned January 22, 2003  
due date January 29, 2003

1. Do Exercise 2.1.9c.
2. For  $\Sigma = \{0, 1\}$ , construct a dfa that accepts the set of all strings with an even number of 0's and an odd number of 1's.
3. Do Exercise 2.1.16. Hint: Given a dfa  $M$  for  $L$ , describe how to modify  $M$  to accept  $L - \{\lambda\}$ .
4. Do Exercise 2.2.6.
5. For  $\Sigma = \{a, b\}$ , construct an nfa that accepts the set of all strings that contain a substring satisfying the pattern  $b^+ab^+ab^+$ .
6. (Extra Credit) Let  $\Sigma = \{0, 1\}$ . Interpret a string  $w$  as a binary number. Construct a dfa or nfa that accepts the set of all strings such that  $w \bmod 5 = 1$ . Hint: Let each state correspond to a different value of  $w \bmod 5$ .