Homework 4

CS 4313 – Spring 2003
Tom Bylander, Instructor

1. Do Exercise 3.3.5.

2. (40 pts.) Provide a dfa, nfa (no more than 5 states), regular expression, and a right-linear grammar for the following language.

   \( w \in L \) if and only if every substring of consecutive \( a \)'s consists of an even number of \( a \)'s, and every substring of consecutive \( b \)'s consists of an odd number of \( b \)'s.

   For example, \((aa)^*\), \((bb)^*\), \((bbbaa)^*\), and \((aaaab)^*\) are subsets of this language. Ensure that \( a \)'s appear between any two substrings of \( b \)'s.

3. Do Exercise 4.1.6. Hint: Show how symmetric difference can be defined in terms of intersection, union, and complementation.

4. Do Exercise 4.3.4d.

5. (Extra Credit) Do Exercise 4.2.8.