CIS 770 Homework #4
Due 5:00 pm, Mar. 1

Be ready to discuss problem 2 on Feb. 26.

1. For each of the following languages, assume the underlying alphabet is \{0, 1\}. Decide whether each language is regular, and prove your answer.

   (a) The set of all strings beginning with a nonempty string of the form \(ww\).
   
   (b) The set of all strings containing a nonempty substring of the form \(ww\).
   
   (c) The set of all strings beginning with a string \(w\) of length at least 3 such that \(w = w^R\).

2. Give CFGs generating each of the following languages, and prove your answers.

   (a) The set of all strings over \{0, 1\} that are not of the form \(ww\).
   
   (b) The set of all strings over \{0, 1\} with exactly twice as many 0s as 1s.