CSCI 4325
Practice for Quiz/Exam 2

Problem 1: Give state diagrams of NFAs recognizing the following languages. The alphabet is $\Sigma = \{0,1\}$.

(a) L_1 = {w | every odd position of w is a 1}
(b) L_2 = {w | w contains an odd number of 0's, or exactly two 1's}
(c) L_3 = {w | w contains the substring “000”}
(d) L_4 = {w | w ends with “101”}
(e) L_5 = {w | w contains the substring “000” and ends with “101”}
(f) L_6 = {w | w is any binary string except “11101”}

Problem 2: Give a regular expression for the following, and then convert the expressions to NFAs.

(a) A = {w : w has two 0's } where Σ= {0,1}
(b) B = {w : w ends in “bbb” } where Σ= {a,b}
(c) C = {w : w starts with “aa” and ends with any number of “b”s } where Σ= {a,b,c}
(d) D = {w : w is a string representing an even binary number} where Σ= {0,1}

Problem 3: Design NFAs to recognize the following regular languages, and then convert the NFAs to DFAs.

(a) $(a \cup b)^* abb(a \cup b)^*$
(b) $(((aa)^* (bb)) \cup ab)^*$
(c) $(ab)^* a(ba)^*$
(d) $(b(aaaaa)^* bb \cup bab)$
(e) Give a description (english) of the languages accepted by (c) and (d).