Name_____

Homework #2

People I worked with and URL's of sites I visited:

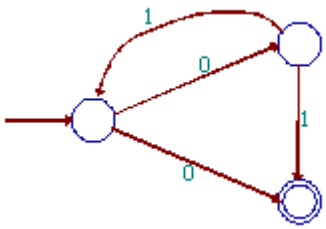
1. Show the following languages are regular by creating finite automata with L = L(M)

a) Strings over {a,b} that contain 2 consecutive *a*'s
b) Strings over {a,b} that do not contain 2 consecutive *a*'s
c) The set of strings over {0,1} which contain the substring *00* and the substring *11*
d) The set of strings over {a,b} which do not contain the substring *ab.*

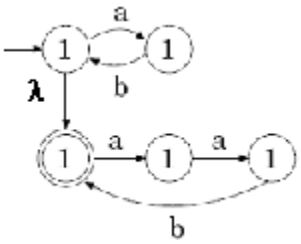
Show your answers in both table and graph form.

#2. Describe L(M) for the following nfa's: a) in words and b) as a regular expression

a)



b)



#3. Create an NFA (with λ transitions) for all strings over {0, 1, 2} that are missing at least one symbol. For example, *00010*, *1221*,and *222* are all in L while *221012* is not in L

#4. a) Given an NFA with several final states, show how to convert it into one with exactly one start state and exactly one final state.

b) Suppose an NFA with k states accepts at least one string. Show that it accepts a string of length k-1 or less.

#5. Let L be a regular language. Show that the language consisting of all strings not in L is also regular.