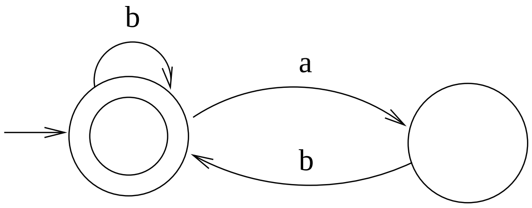
SOLUTIONS

CSE105 Quiz #1 (Yellow Version)
Thursday, Oct. 7, 1999

1. Give the state diagram of an NFA over the alphabet { **a** **b** } that accepts

   {w | w has each **a** immediately followed by **b** }

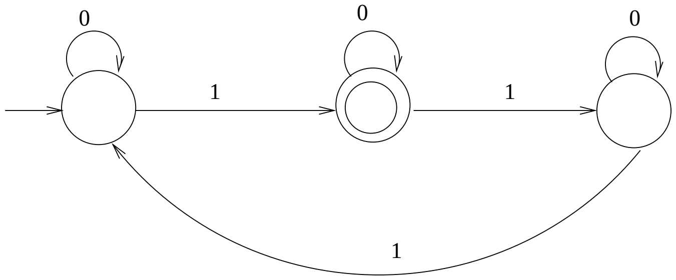
   Note that the only restriction in the language is that IF an 'a' is in a particular string, then it must be followed IMMEDIATELY by a 'b'.



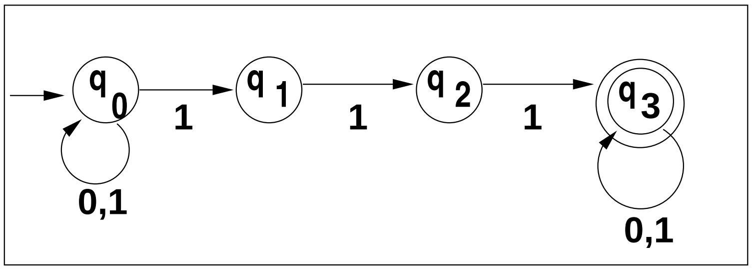
2. Give the state diagram of a DFA over the alphabet { **0** **1** } that accepts

   {w | w has $(3m + 1)$ **1**'s for some integer $m \geq 0$}

   Remember that m can be any nonnegative integer (this includes 0!). The FA must accept any string with (3m+1) 1's. Strings with (3m) or (3m+2) 1's should be rejected.



3. Describe L(M) where M is given by the following state diagram.



   L(M) = {w | w is a string over the alphabet 0,1 which contains the substring 111}

4. Define the term alphabet.

   An alphabet is defined to be a finite set of symbols.