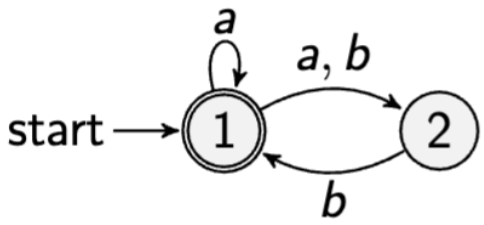
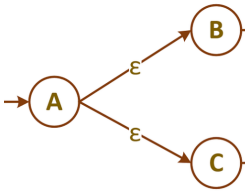
Chapter 1.3 Practice

1. Convert the NFA below to equivalent DFA.



2. Give state diagrams of NFAs with the specified number of states recognizing each of the following languages. Note: In all parts, the alphabet is {0,1}.
   a. {w | w contains the substring 0101 (i.e., w = x0101y for some x and y)}; with 5 states
   b. {w | w contains an even number of 0s, OR contains exactly two 1s}; with 6 states. Hint: You can use the notation below for the first states to represent the OR operation.



   c. The language $0^*1^*0^+$; with 3 states (Note: 0^+ means 1 or more 0s)
   d. The language {w | w ends with 00}; with 3 states
   e. The language {w | w contains at least two 0s or exactly two 1s}; with 3 states (Note: Do not use the notation in b for this.)