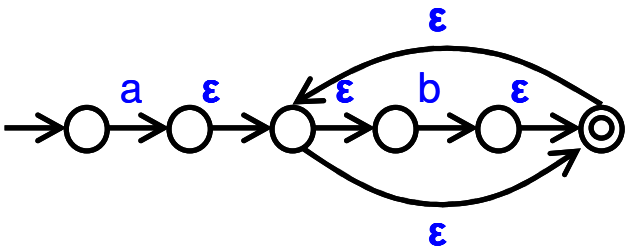
CMSC330 Fall 2010 Quiz #2 Solutions

1. (2 pts) What is the output (if any) of the following Ruby program? Write FAIL if code does not execute. Recall that Array.collect applies a code block to each element of an array, and creates a new array from the value returned by the code block.

```
a = [1,2,3]                          # Output =   0!
b = a.collect { |x|  "#{x-1}!" }                1!
puts b                                          2!
```

2. (6 pts) Consider the regular expression ab*. Recall * has higher precedence than concatenation.
   a. (1 pt) Does it accept the string "a"? Circle one: **Yes** **No**

   b. (5 pts) Create a NFA for ab*, using the algorithm discussed in class.



3. (12pts) Consider the following NFA.

   a. (2 pts) Does it accept the string "aa"? List a possible sequence of state transitions (e.g., 1,3,4) leading to acceptance / rejection of "aa".

      Yes: 1,2,4,1,2,4

   b. (10 pts) Convert the NFA to a DFA using the subset construction algorithm discussed in class. Be sure to label each state in the DFA with the corresponding state(s) in the NFA.

NFA	DFA resulting from subset construction