CMSC330 Spring 2010 Quiz #1 Solution

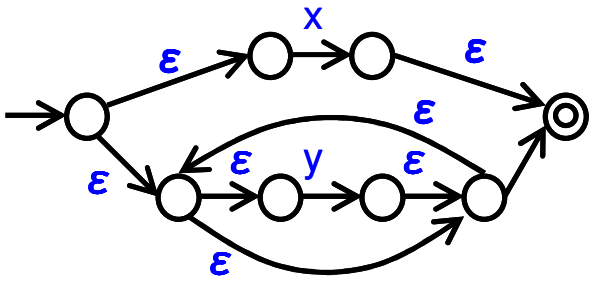
1. (6 pts) What is the output (if any) of the following Ruby program? Write FAIL if code does not compile or if executing the code throws a runtime exception.

   a.
   ```
   a = 0
   puts "a++ = #{a+1}" if a
   puts a
   ```
   # OUTPUT =
   a++ = 1
   0

   b.
   ```
   b = [ 1, 2, 3 ]
   b.each { |c| puts c }
   ```
   # OUTPUT =
   1
   2
   3

   c.
   ```
   if "route66" =~ /([^a-z]+) /
       puts $1
       puts $2
   else
       puts "None"
   end
   ```
   # OUTPUT =
   66
   nil

2. (6 pts) Construct a NFA for the regular expression x|y*. You must use the algorithm described in class for full credit.



3. (8 pts) Convert the following NFA into a DFA by applying the subset construction algorithm discussed in class. Be sure to list the NFA states represented by each DFA state.