

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.

```

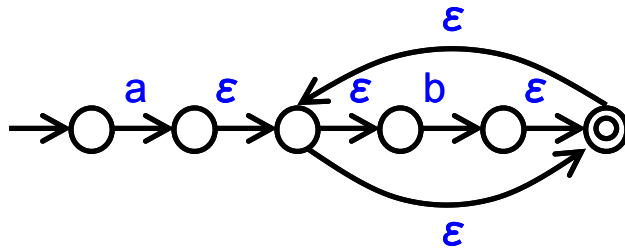
a = [1,2,3]
b = a.collect { |x| "#{x-1}!" }
puts b

```

Output = **0!**
1!
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.

