

CMSC330 Fall 2010 Quiz #2

Name _____

Discussion Time (circle one): 9am 10am 11am 12pm 1pm 2pm

Instructions

- Do not start this test until you are told to do so!
- You have 15 minutes for this quiz.
- This is a closed book exam. No notes or other aids are allowed.
- Answer essay questions concisely in 2-3 sentences. Longer answers are not needed.
- For partial credit, show all of your work and clearly indicate your answers.
- Write neatly. Credit cannot be given for illegible answers.

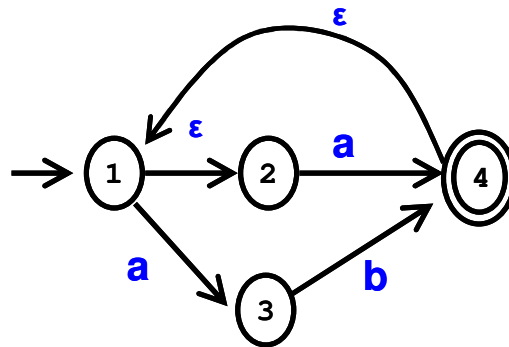
1. (2 pts) What is the output (if any) of the following Ruby program? Write FAIL if code does not execute. Recall that `Array.collect` applies a code block to each element of an array, and creates a new array from the value returned by the code block.

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

Output =

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”.
- 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.