

CMSC330 Spring 2015 Quiz #2

Name _____

Discussion Time (circle one): 10am 11am 12pm 1pm 2pm 3pm

Discussion TA (circle one): Amelia Casey Chris Mike Elizabeth Eric Tommy

Instructions

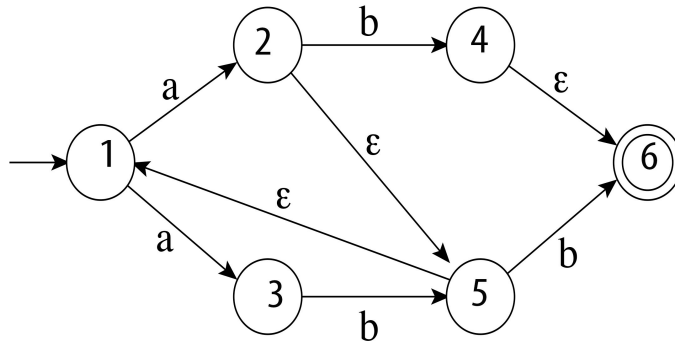
- Do not start this test until you are told to do so!
 - You have 15 minutes for this quiz.
 - This is a closed book exam. No notes or other aids are allowed.
 - For partial credit, show all of your work and clearly indicate your answers.
1. (8 pts) Write a Ruby function `change_date_format` which takes a string `str` in "YYYY-MM-DD" format and returns a string in "MM/DD/YYYY" format, where each of *M*, *Y*, and *D* in the above are (any) digit. For example if you are given the string "1995-07-10" as input, then your code should return the string "07/10/1995". If the input string does not match the required format then you should return the input string unchanged. For example if your string `str` is "Ruby is cool" or "abcd-ef-gh" then you should return `str` as neither of these represent dates (they contain non-digits).

Hint: Recall that `e =~ /RE/` in Ruby attempts to match the string `e` against regular expression `RE`. Another way to do matching is `e.scan(/RE/)`.

```
def change_date_format(str)
  if (str =~ /^(\d{4})-(\d{2})-(\d{2})$/)
    d = str.scan(/(\d+)/)
    d[1]+"/"+d[2]+"/"+d[0]
  else
    str
  end
end

d = '1981-12-31'
s = change_date_format d
puts s
```

2. (6 pts total) Consider the following NFA.



a. (3 pts) Does the NFA accept the string "abbb"? If so, list a sequence of state transitions (e.g. 1,2,3) that leads to its acceptance.

It rejects the string "abbb"

b. (3 pts) Does the NFA accept the string "ababab"? If so, list a sequence of state transitions (e.g. 1,2,3) that leads to its acceptance.

It accepts the string "ababab"

1,3,5,1,3,5,1,2,5,6

or

1,3,5,1,3,5,1,2,4,6

3. (6 points) Reduce the following NFA to a DFA according to the subset construction algorithm. Make sure the states in the NFA are labeled with the corresponding DFA states as prescribed by the algorithm (i.e., just writing an equivalent DFA will not get you full credit).

