CMSC330 Spring 2014 Quiz #1 Solution

Name _____

Discussion Time	**10am**	**11am**	**noon**	**1pm**	**2pm**
TA Name (circle):	**Tammy**	**Tammy**	**Tammy**	**Daniel**	**Daniel**
		Ilse	**Casey**	**Ian**	

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.

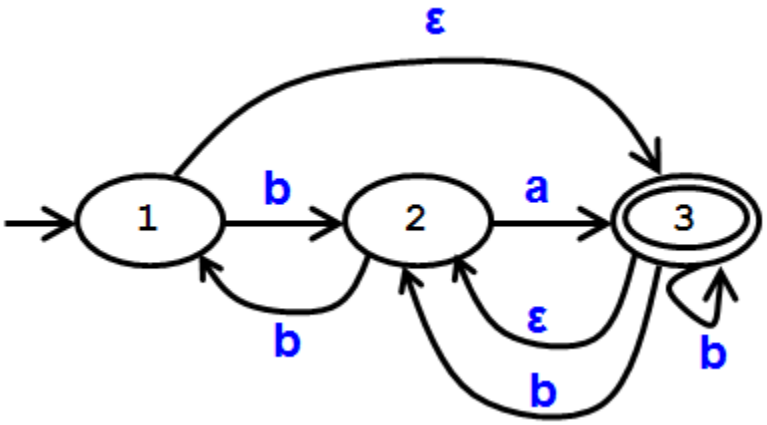
```
a = "Adama"                                    # Output = Star
b = "Adama"                                              OK
if a.equal? b then puts "BSG" else puts "Star" end
puts "OK" if a.length - b.length
```

2. (8 pts) Write a Ruby method ***get_request_number*** that given a string *str*, uses regular expressions and back references to find and return a request number (integer) associated with a request. A valid request has the letters **Req**, followed by a **#,** followed by two digits. For instance, **get_request_number("please use Req#12 after 6 pm or dial 457")** should return the integer value 12. The method will return -1 if no request is found.

```
def get_request_number(str)
  if str =~ /Req#(\d\d)/
    return $1.to_i
  end
  return -1
end
```

Alternative REs: /Req#(\d{2})/, /Req#([0-9][0-9])/, etc.

3. (10 pts) Consider the following NFA.



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

// 1,3,2,3,2,3,3

b. (8 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.