

# CMSC 330 Fall 2016 Quiz #3 - SOLUTION

Gradescope ID \_\_\_\_\_

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

Discussion TA (circle one)      Alex   Austin   Ayman   Brian   Damien   Daniel K.

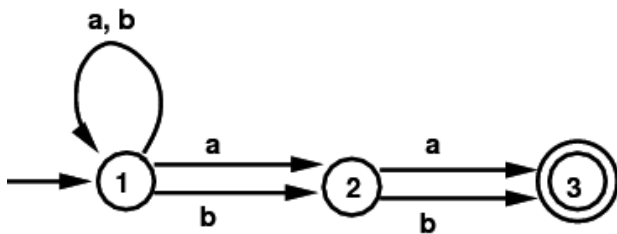
                         Daniel P.   Greg   Tammy   Tim   Vitung   Will K.

## Instructions

- Do not start this quiz until you are told to do so.
- You have 15 minutes for this quiz.
- This is a closed book quiz. No notes or other aids are allowed.
- For partial credit, show all of your work and clearly indicate your answers.

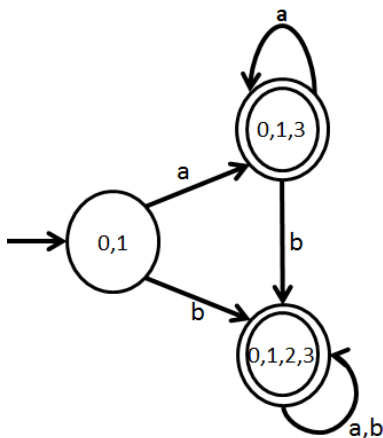
1. (4 pts) Write an NFA for  $(a|b)^*(aa|bb)$ .

### Sample Solution



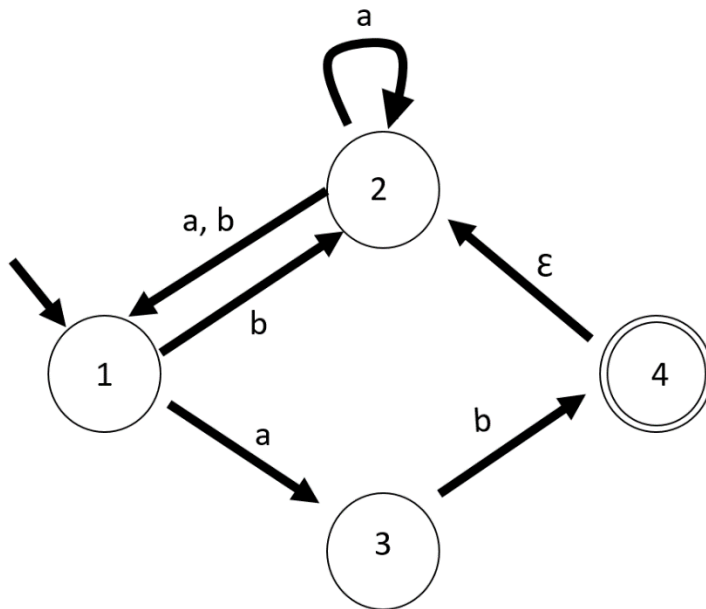
2. (6 pts) Convert the following NFA to a DFA. Provide proof of your work.

### Solution:



3. (4 pts) For the following NFA:

Circle "accept" if the following string is accepted



- a. baab                    **accept**
- b.** abb                    **Not accept**
- c. ababab                **accept**
- d. bbbaaab               **accept**

4. (6 pts) Given the grammar:

$S \rightarrow SaS \mid T \mid a$

$T \rightarrow Tb \mid bSb \mid \epsilon$

Provide a **leftmost** derivation of the string "bababb"

**S -> TaT -> bSbaT -> babaT -> babaTb -> babaTbb -> bababbb**