

PROJECT 2 CMSC 452. Morally DUE March 4

NEEDS TO BE TYPED EXCEPT THE PART WHERE YOU DRAW
A DFA.

NOTATION: $\#_a(w)$ is the number of a 's in w .

1. (0 points) What is your name? Write it clearly. Staple your HW. When is the midterm? Where is the midterm? When is the Final?
2. (40 points) Describe the $R(i, j, k)$ algorithm that takes a DFA M and produces a regular expression α such that $L(M) = L(\alpha)$. Be NEAT. Someone who DOES NOT KNOW THE ALGORITHM should be able to take your description and understand it and code it up. (They do not need to want to code it up.)
3. (10 points) Draw a DFA over the alphabet $\{a, b\}$ for the language

$$\{w \mid \#_a(w) \equiv 1 \pmod{3}\}.$$

Label the states with numbers starting at 1.

4. (40 points) Go through the $R(i, j, k)$ algorithm to turn this DFA into a reg expression. At each step simplify the regular expression. Be careful, be neat.
5. (10 points) (this should be easy) Use your work to get a reg expression for

$$\{w \mid \#_a(w) \equiv 2 \pmod{3}\}.$$