

HW 2 CMSC 452. Morally DUE Sep 16

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. (20 points) Let $n_a(w)$ be the number of a 's in w . Let $n_b(w)$ be the number of b 's in w . (NOTE- THIS WILL BE STANDARD NOTATION FOR THE SEMESTER.) Assume the alphabet is $\{a, b\}$. Let $n \in \mathbb{N}$ with $n \geq 10$

Write a DFA for the language

$$\{w \mid n_a(w) \equiv 4 \pmod{n}\}$$

You may use DOT-DOT-DOT notation.

How many states does your DFA have?

3. (20 points) Let $m \geq 1$.

Write a DFA for the language

$$\{w \mid b^m \text{ is a suffix of } w\}$$

You may use DOT-DOT-DOT notation.

How many states does your DFA have?

4. (20 points) Let $m, n \in \mathbb{N}$. Do NOT write a DFA for the language

$$L = \{w \mid n_a(w) \equiv 4 \pmod{n}\} \cap \{w \mid b^m \text{ is a suffix of } w\}$$

however, say HOW you would and how many states it would use. (HINT- this is EASY— use a known theorem from class.)

5. (20 points) Let $m, n \in \mathbb{N}$ such that $m \equiv 0 \pmod{n}$. Let L be as in the last problem. Write an NDFA for L . You may use DOT-DOT-DOT notation. How many states does it have? (It should have LESS THAN the DFA that you looked at in the last problem.)