HW 1 CMSC 452. Morally DUE Feb 4

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? IMPORTANT- I WANT TO MAKE SURE I HAVE YOUR CORRECT EMAIL ADDRESSES. I HAVE EMAILED ALL OF YOU USING WHAT I CURRENTLY THINK IS YOUR EMAIL ADDRESS BUT IF YOU DIDN’T GET IT THEN EMAIL ME ASAP TO GIVE ME YOUR REAL EMAIL ADDRESS.

2. (50 points) Let $n_a(w)$ be the number of $a$’s in $w$. Let $n_b(w)$ be the number of $b$’s in $w$. Write a DFA for the language

$$\{w : n_a(w) \leq 3 \text{ AND } n_b(w) \equiv 2 \text{ mod } 4\}.$$

3. (50 points) Let $\Sigma = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$. We interpret strings over $\Sigma$ as numbers in base 10. A DFA CLASSIFIER is a DFA where instead of having final states has each state is labelled, so we think of the DFA as computing a function. (If on string $w$ you end up at state $q$ then we think of $w$ as being mapped to the label of $q$.) Write a DFA CLASSIFIER that will, on input $w$, tell what $w$ is congruent to mod 6.