CS 341, Day Class, Spring 2009   Quiz #1   Prof. M. K. Nakayama

Print Family (i.e., Last) Name: _____

Print Given (i.e., First) Name: _____

Student ID Number: _____

    For each question, write the answer next to the question. If you need to use scratch paper, use the back of the quiz. Any scratch work in the answer spaces will be marked wrong and points will be deducted.

    During this quiz it is prohibited to:

1. exchange information with any other person in any way, including by talking or exchanging papers or books;

2. use any electronic aid, including calculators;

3. use any books or notes;

4. leave the classroom before you complete and turn in your quiz.

    I have read and understand all of the instructions above. On my honor, I pledge that I will not violate the provisions of the NJIT Academic Honor Code.

_____

Signature and Date

1. Let $\Sigma = \{a, b\}$. Define $A = \{w \in \Sigma^* \mid w$ begins with a and ends with $b\}$.

   (a) List the first 6 strings in A in lexicographic order.

   (b) Define the function $f : \Sigma^* \rightarrow \Sigma^*$ such that for a string $w \in \Sigma^*$, $f(w)$ is the same string with the symbol in the first position removed; i.e., if $w = w_1 w_2 w_3 \cdots w_n$ with each $w_i \in \Sigma$, then $f(w) = w_2 w_3 w_4 \cdots w_n$. For example, $f(babba) = abba$ since the symbol in the first position in the string $babba$ is removed by the function f. Is A closed under f? If so, give a proof. If not, give a counterexample with an explanation.

   (c) Draw a DFA for A. You only need to draw the picture. You do not need to give the formal definition of your DFA as a 5-tuple.