CIS 341, Evening Class, Spring 2004   Quiz #1   Prof. M. K. Nakayama

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

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

Write all answers in the space provided. Use the backs of the sheets for any scratch work.

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 have not violated the provisions of the NJIT Academic Honor Code.

_____
Signature and Date

1. Let L_1 be some language over an alphabet Σ, and let w be a string over Σ. Define language $L_2 = L_1 + \{w\}$, and suppose that $L_1^* = L_2^*$.

   (a) Is it necessarily true that $w \in L_1$? If this is necessarily true, give a proof. If this is not necessarily true, give a counterexample. Be sure to explain your answer.

   (b) Is it necessarily true that $w \in L_1^*$? If this is necessarily true, give a proof. If this is not necessarily true, give a counterexample. Be sure to explain your answer.

2. Let L be the language over the alphabet $\Sigma = \{0, 1\}$ of strings that have exactly two 1's in them. For example, $0100010 \in L$, but $100 \notin L$. Give a regular expression for L.