CIS 341, Day Class, Spring 2006　　　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.

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Signature and Date

1. Answer the questions below for the sets

$$S = \{\, \varepsilon,\ 01,\ 10,\ 110\,\}, \qquad T = \{\, 1,\ 011\,\}.$$

For parts (a), (b), and (c), write the elements in lexicographic order. For any infinite sets, list only the first 8 elements in lexicographic order, but be sure to also indicate that the set is infinite by including 3 dots after listing the first 8 elements.

(a) What is $S \circ T$?

(b) What is T^+ ?

(c) What is $T \cap S$?

(d) What is $T \times S$?

(e) What is $\mathcal{P}(T)$, the power set of T ?

(f) Is T closed under concatenation? Explain your answer.

2. For $\Sigma = \{0, 1\}$, let

$$A = \{\, w \in \Sigma^* \mid w \text{ has an even number of 0s and an odd number of 1s} \,\}.$$

Give a DFA that recognizes the language A.