CSI 409 — Fall 2015: Homework #3

Due date: Oct 9

Answer all questions on your own. Turn in your answers at the beginning of class. Write your preferred e-mail address (e.g. zz6000@albany.edu). If you are using more than one sheet of paper, make sure that you staple all the sheets together.

Remember that collaboration of any kind is not allowed.

1. Construct a deterministic finite automaton (DFA) that recognizes the following language over the alphabet \( \{a, b\} \):

   \[ \{w \mid w \text{ is any string not in } (a \cup ab)^* b^* \} \]

2. Construct a deterministic finite automaton (DFA) that recognizes the language \( a^* b^* \setminus (a \cup ab)^* \). The alphabet is \( \{a, b\} \).

3. Consider the following NFA. The set of states, \( Q \), is \( \{1, 2, 3\} \). The initial state is 1 and the accepting state is 2. The alphabet is \( \{a, b\} \).

Convert this NFA to a DFA. Show work clearly.