ECE351:
Compilers
Assignment #1

Due January 30, 2014

The Questions

1. Write a recursive program that computes the Fibonacci series.

2. Write regular expressions for the following languages over the alphabet $\Sigma = \{0, 1\}$:

   (a) All strings that do not end with 11.

   (b) All strings that contain an odd number of 0's.

   (c) All strings which do not contain the substring 1010.

3. Draw DFAs for each of the languages from question 2.

4. Let L be the language over the alphabet $\{a_1, a_2, a_3\}$ defined as:
   L : All strings in which a_i occurs at least i times for some $a_i \in \{a_1, a_2, a_3\}$.
   Draw a non-deterministic finite automaton (NFA) for L.

5. Exercises # 1 and # 4 on page 54 of the textbook.

6. Exercises # 3, # 4 and # 5 on page 106 of the textbook.

7. Exercise #4 on page 138 of the textbook.

8. Exercises #5, #6, and #7 on page 139 of the textbook.

9. Describe in your own words the algorithm to convert an NFA (non-deterministic finite automaton) to a DFA (deterministic finite automaton).