CSE 322: Introduction to Formal Models in Computer Science
Assignment #3
January 28, 2002
due: Monday, February 4

1. Prove the correctness of the construction in Theorem 1.23. That is, you should prove that $w \in L(N)$ iff $w \in L(N_1) \circ L(N_2)$.

2. Let $L$ be the language accepted by the NFA of Example 1.15 on page 52. Use the construction given in the proof of Theorem 1.24 to give the state diagram of an NFA recognizing the language $L^*$.

3. Exercise 1.11. As part of your counterexample you must supply a string that proves that $L(N) \neq (L(N_1))^*$.

4. Use the procedure described in Lemma 1.29 to convert the regular expression

$$((\varepsilon \cup 1) \cup 00^*1)^*$$

into the state diagram of an NFA. Do not skip steps or simplify your automaton. That is, everyone who follows the procedure correctly should come up with the exact same diagram.

5. Exercise 1.16(b). Do not skip steps or simplify your regular expressions.