CS-302 Theory of Computation
Assignment 6

Name: _____

1. Let $M_1 = (Q_1, \Sigma, \Delta_1, s_1, F_1)$ and $M_2 = (Q_2, \Sigma, \Delta_2, s_2, F_2)$ be two nondeterministic finite state automata. Define the nondeterministic finite state automaton $M = (Q, \Sigma, \Delta, s, F)$ as follows:
   $Q = Q_1 \cup Q_2$
   $\Delta = \Delta_1 \cup \Delta_2 \cup \{(f, \lambda, s_2)$ for every $f \in F_1\}$
   $s = s_1$
   $F = F_2$
   Prove that: $L(M) = L(M_1)\, L(M_2)$

2. For each of the following languages, construct a nondeterministic finite state automaton, $N_1 = (Q, \Sigma, \Delta, s, F)$ that accepts the language. BE NEAT!

   a) $(01 \cup 1)(1 \cup 000)1^*1((0^*1)^* \cup 1)^*$

   b) $01\big((1 \cup 00 \cup 001)11^*\big)^*1$