

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:

$$Q = Q_1 \cup Q_2$$

$$\Delta = \Delta_1 \cup \Delta_2 \cup \{(f, \lambda, s_2) \text{ for every } f \in F_1\}$$

$$S = S_1$$

$$F = F_2$$

Prove that: $L(M) = L(M_1) L(M_2)$

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