Quiz 3A: NFAs

CS 212 Nature of Computation

Habib University — Fall 2023

Total Marks: 10 | Date: September 6, 2023
Duration: 15 minutes | Time: 830–845h

Student ID: _____

Student Name: _____

1. (10 points) Prove or disprove the following claim.

   Claim 1. *For every DFA, there is an equivalent NFA.*

Solution: We provide a proof by construction. That is, assuming a DFA, $M = (Q, \Sigma, \delta, q_0, F)$, we construct an NFA, $N = (Q_1, \Sigma, \delta_1, q_1, F_1)$, such that $L(N) = L(M)$.

Proof. The construction is as follows.

1. $Q_1 = Q$,
2. $q_1 = q_0$,
3. $F_1 = F$,
4. $\forall q \in Q \forall a \in \Sigma; (\delta_1(q, a) = \{\delta(q, a)\}$.

□