CSC341 HW3

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1 Academic Honesty

Written Sources Used:

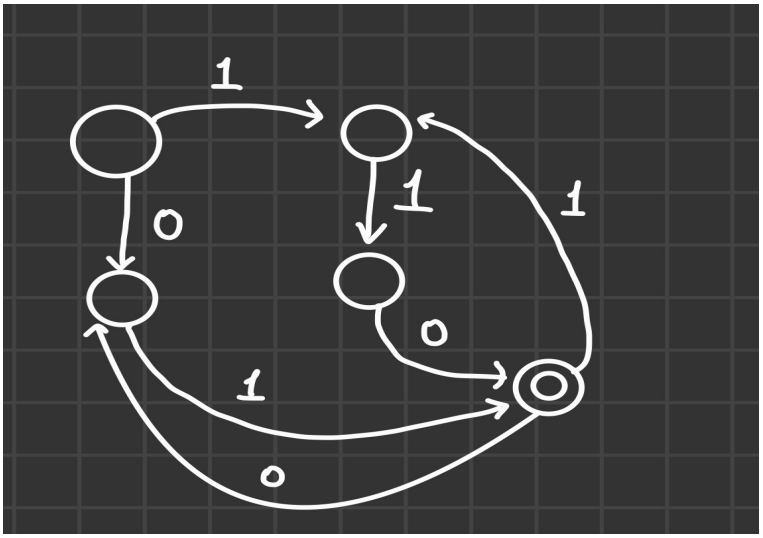
Michael Sipser - Introduction to the Theory of Computation
https://www.geeksforgeeks.org/conversion-from-nfa-to-dfa/

Help Obtained: None

2 Question 1

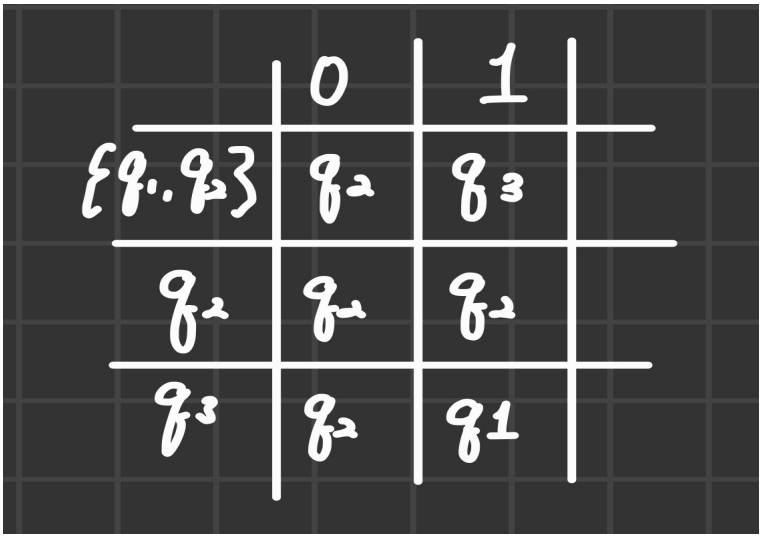
$(-)^{?}\Sigma^{+}(.)^{?}\Sigma^{+}$

3 Question 2



4 Question 3

$Q = \{q_1, q_2, q_3\}$
$\Sigma = \{0, 1\}$
$q_0 = \{q_0, q_2\}$
$F = q_2$
$\delta =$



5 Question 4

5.1 Number 1

$Q^{`} = Q$

$\Sigma^{`} = \Sigma$

$\delta^{`}$ will be in the reverse order of the DFA so that the NFA accepts the string in reverse order. For example, if $\delta(a, b) = c$, then $\delta^{`}(c, b) = a$.

$q_0^{`} = F$ meaning that the accepting states in the DFA will become the starting states in the NFA.

$F^{`} = q_0$ meaning that the starting states in the DFA will become the accepting states in the NFA.

5.2 Number 2

The constructed NFA N from the above question corresponds to the same automata but in reverse order; the accepting states and the starting states are the opposite but the path that leads to each other stays the same. Since the DFA D recognizes the language A, meaning that there is a path that leads from the starting state to the accepting state, there also exists a path that leads from F to q_0 which is $q_0^{'}$ to $F^{'}$. This leads to the conclusion that the NFA N recognizes A^R.