

**COM S 381 Homework 3**

**Due date: \*Wednesday\*, June 6**

Do the following exercises from the textbook:

**4.4.2, 5.1.1c, 5.1.2b, 5.1.2c, 5.1.7a, 5.1.7b**

Show that if

$$M = (Q_M, \Sigma, \delta_M, q_M, F_M)$$

and

$$N = (Q_N, \Sigma, \delta_N, q_N, F_N)$$

are two isomorphic deterministic finite automata, then  $L(M) = L(N)$ . Recall that an isomorphism of automata is a bijection

$$f : Q_M \rightarrow Q_N$$

which satisfies:

$$\begin{aligned} f(q_M) &= q_N \\ f(\delta_M(p, a)) &= \delta_N(f(p), a) \text{ for all } p \in Q_M, a \in \Sigma \\ p \in F_M &\Leftrightarrow f(p) \in F_N. \end{aligned}$$