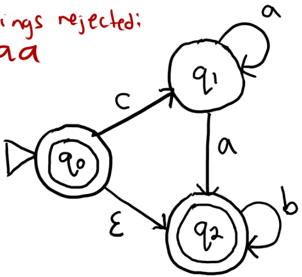
Examples of strings accepted:

ca ε b

Examples of strings rejected:

c bc aaa



To construct DFA M from NFA N:

Let $N = (Q, \Sigma, \delta, q_0, F)$. Define ($Q = \{q_0, q_1, q_2\}$)

$$M = (P(Q), \Sigma, \delta', q', \{X \subseteq Q \mid X \cap F \neq \emptyset\})$$

where $q' = \{q \in Q \mid q = q_0$ or is accessible from q_0 by spontaneous moves in N$\}$

state in DFA (labeled by a subset of states from NFA N)

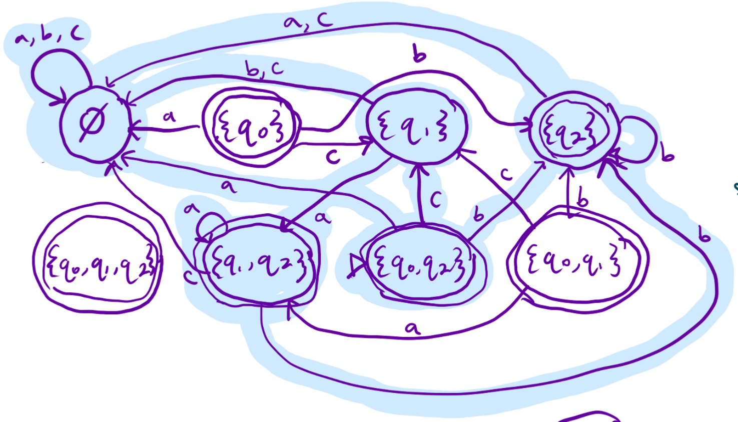
$\delta'((X, x)) = \{q \in Q \mid q \in \delta((r, x))$ for some $r \in X$ or is accessible from such an r by spontaneous moves in N$\}$

symbol to read

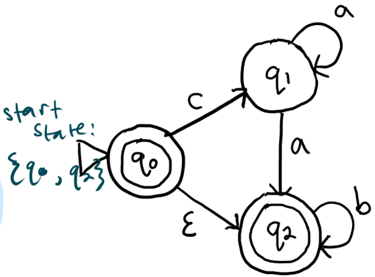
$X = \{q_0, q_2\}$

$$\delta'((\{q_0, q_2\}, c)) = \delta((q_0, c)) \cup \delta((q_2, c)) = \{q_1\}$$

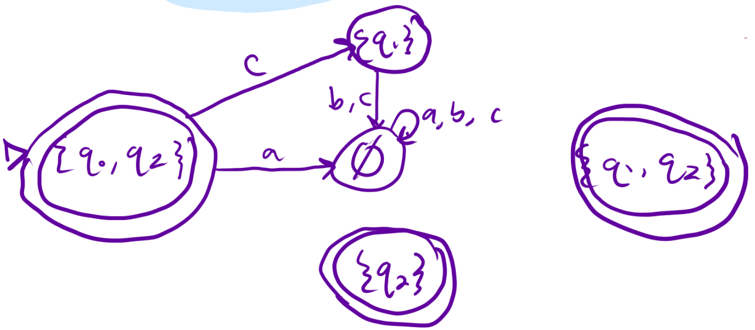
$$\{q_1\} \cup \emptyset$$



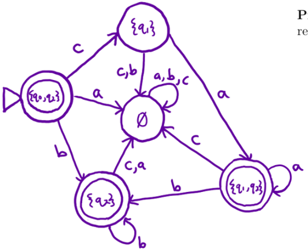
a, b, c
a, c
b, c
b
∅
{q0}
{q1}
{q2}
a
c
a
a
c
b
c
b
b
b
{q0, q1, q2}
{q1, q2}
{q0, q2}
{q0, q1}
a
c
a



start state:
{q0, q2}
q0
q1
q2
c
a
ε
a
b



{q1}
c
b, c
a, b, c
{q0, q2}
a
∅
{q1, q2}
{q2}



Proof idea: Trace all possible paths from start state to accept state. Express labels of these paths as regular expressions, and union them all.

1. Add new start state with ε arrow to old start state.
2. Add new accept state with ε arrow from old accept states. Make old accept states non-accept.
3. Remove one (of the old) states at a time: modify regular expressions on arrows that went through removed state to restore language recognized by machine.