< Lecture 5 >

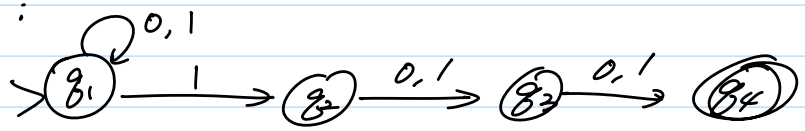
Formally,

Given NFA $N = (Q, \Sigma, \delta, q_0, F)$ and input string w, M accepts $w = y_1 y_2 \cdots y_m$ where $y_i \in \Sigma \cup \{\varepsilon\}$, if there is a sequence of states $r_0, r_1, \cdots, r_m$ that belong to Q s.t

1. $r_0 = q_0$
2. $r_{i+1} \in \delta(r_i, y_{i+1})$ for $i = 0, \cdots, m-1$
3. $r_m \in F$.

Apply formal definition of "M accepts w"

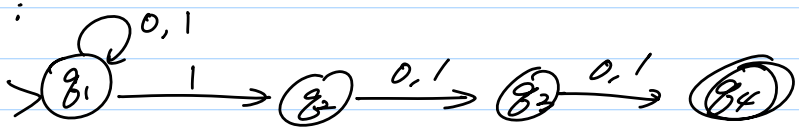
M :



w : 1 0 1

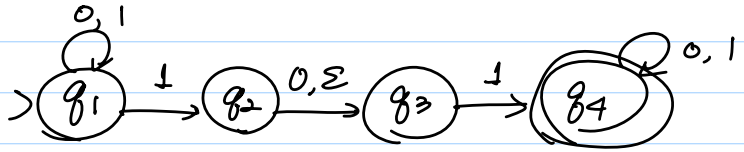
Apply formal definition of "M accepts w"

M :



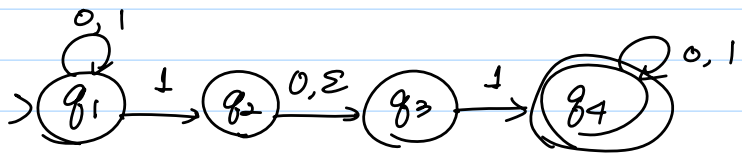
w : 0 1 0 1 1 0

M



w 1 1

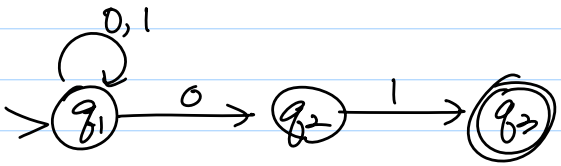
M

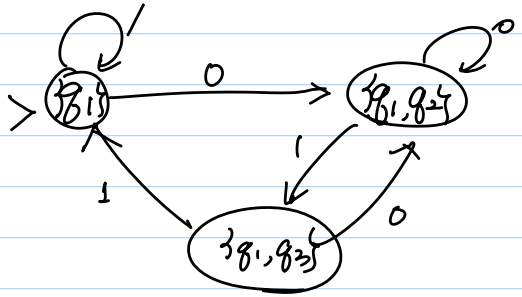


w 0 1 0 1 1 0

- NFA and DFA have the same expressive power.
- Any DFA is trivially a NFA. (Why?)
- Any NFA can be turn to an equivalent DFA

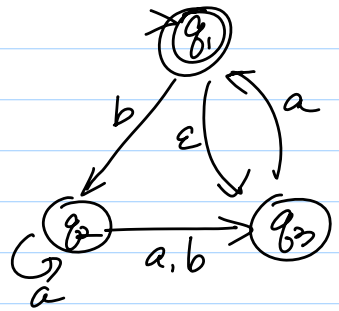
(We say that two machines are equivalent if they recognize the same languages

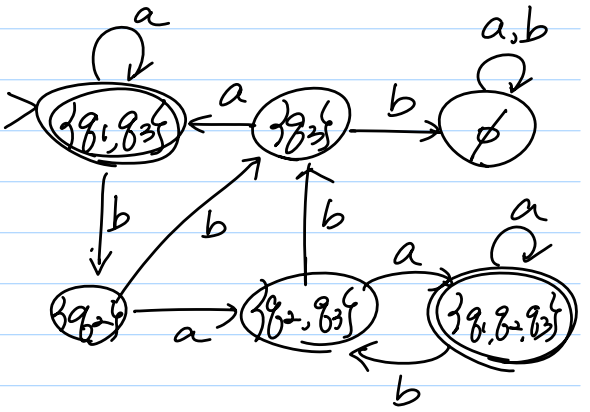




0 1 0

1 0 1





ε, a, baba, baa

b, bb, babba