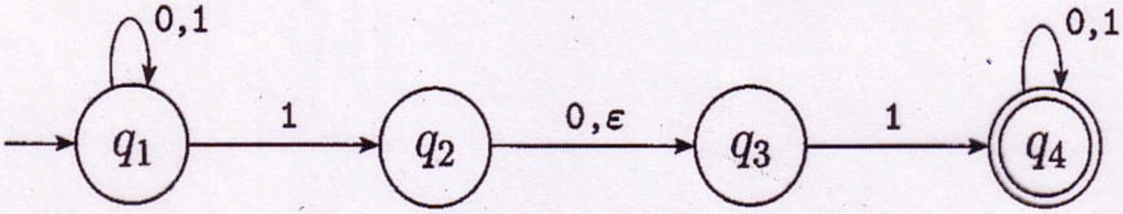
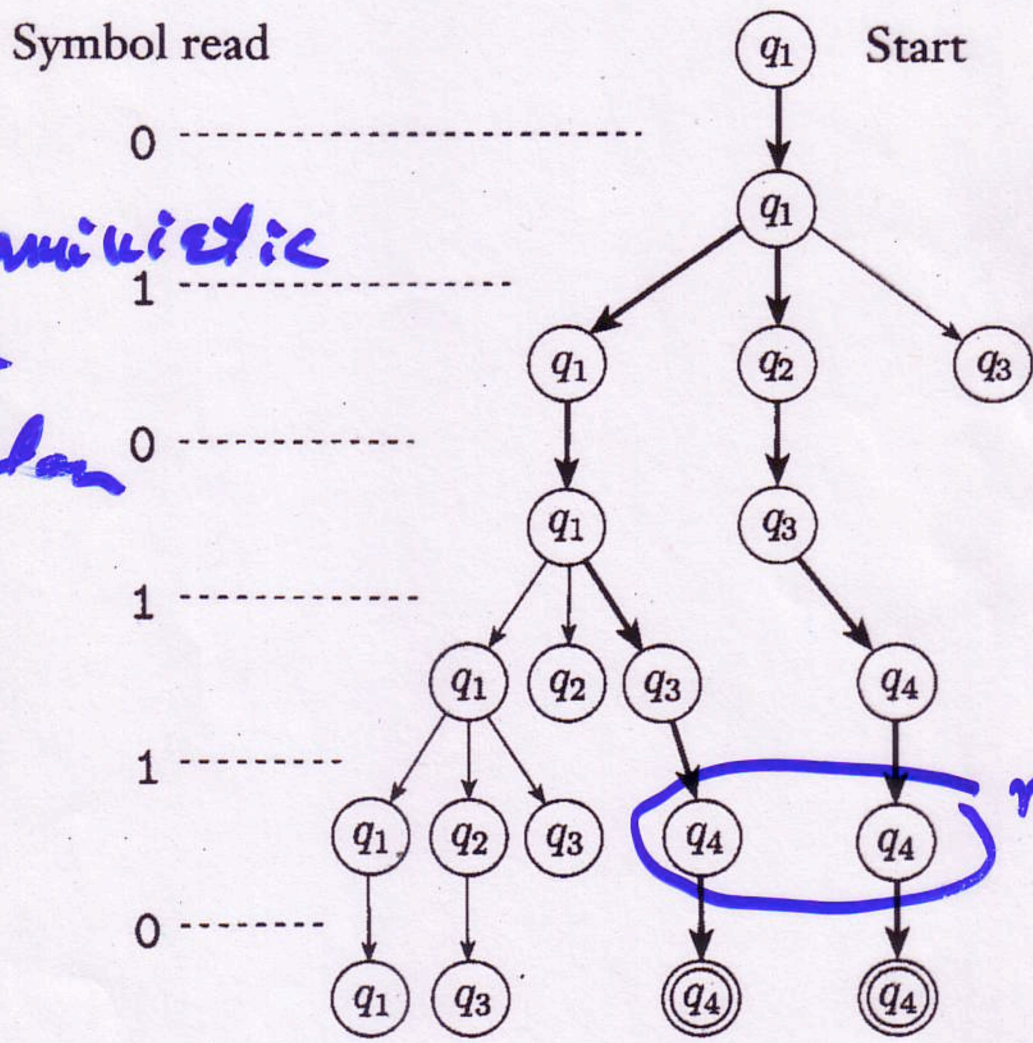


FIGURE **1.27**

Nondeterministic
Finite
Automaton

NFA



redundant

FIGURE **1.29**

5-1

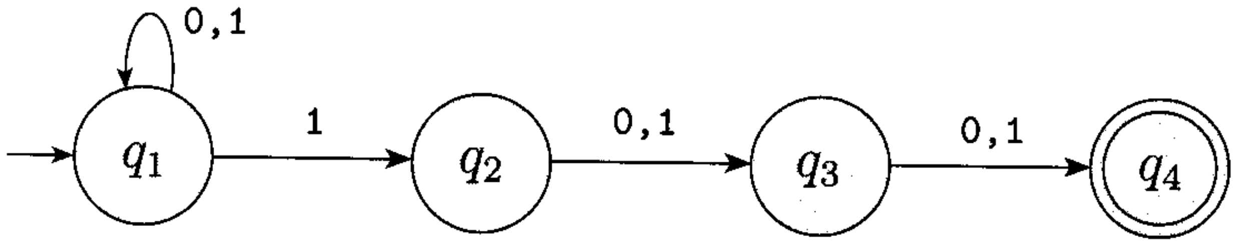


FIGURE 1.31

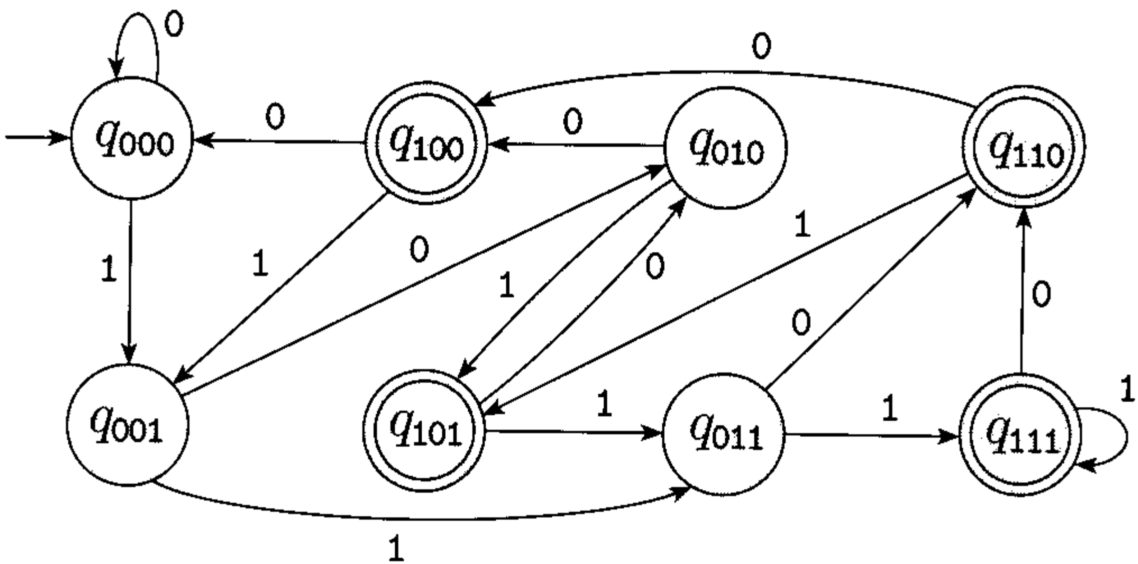


FIGURE 1.32

$N = (Q, \Sigma, \delta, q_0, F)$

$\delta : Q \times (\Sigma \cup \{\varepsilon\}) \to 2^Q$

NFA

$\Sigma_\varepsilon = \Sigma \cup \{\varepsilon\}$

Q, Σ, q_0, F as in DFA

DEFN ("is in state q")

M might ends in state q after reading w $\in \Sigma^*$ if

(1) $w = w_1 w_2 \cdots w_n$

where $w_i \in \Sigma \cup \{\epsilon\}$

(2) $\exists$ state $r_0, r_1, r_2 \cdots r_n \in Q$

s.t. (a) $r_0 = q_0$

(b) $\forall\ 1 \le i \le n$

$r_i \in \delta(r_{i-1}, w_i)$ ~~$= r_i$~~

(c) $r_n = q$

~~Fact: q is unique~~
~~because δ is a function, basically~~

M accepts $w \iff$ the state q reached by M after reading w is $\in F$.

Language recognized

$L(M) = \{ w \in \Sigma^* \mid M \text{ accepts } w \}$

3-1
5-4