giovedì 30 marzo 2023          11:51

Trasformare il seguente NFA in DFA



$$\delta \qquad \begin{array}{c|c|c|c} & 0 & 1 & \varepsilon \\ \hline q_0 & \{q_2\} & \{q_0\} & \{q_1\} \\ q_1 & \{q_1\} & \varnothing & \varnothing \\ q_2 & \varnothing & \varnothing & \varnothing \end{array}$$
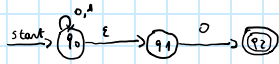
$Q_M = \{\varnothing, \{q_0\}, \{q_1\}, \{q_2\}, \{q_0,q_1\}, \{q_0,q_2\}, \{q_1,q_2\}, \{q_0,q_1,q_2\}\}$

$\delta_M(\{q_0\}, 0) = E(\delta_N(\{q_0\},0)) = \{q_0\}$

$\delta_M(\{q_0\}, 1) = E(\delta_N(\{q_0\},1)) = \{q_0\}$

$\delta_M(\{q_1\}, 0) = E(\delta_N(\{q_1\},0)) = \{q_2\}$

$\delta_M(\{q_1\}, 1) = E(\delta_N(\{q_1\},1)) = \{\varnothing\}$

$\delta_M(\{q_2\}, 0) = E(\delta_N(\{q_2\},0)) = \{\varnothing\}$

$\delta_M(\{q_2\}, 1) = E(\delta_N(\{q_2\},1) = \{\varnothing\}$

$\delta_M(\{q_0,q_1\}, 0) = E(\delta_N(\{q_0\},0)) \cup E(\delta_N(\{q_1\},0)) = \{q_0\} \cup \{q_2\} = \{q_0,q_2\}$

$\delta_M(\{q_0,q_1\}, 1) = E(\delta_N(\{q_0\},1)) \cup E(\delta_N(\{q_1\},1)) = \{q_0\} \cup \varnothing = \{q_0\}$

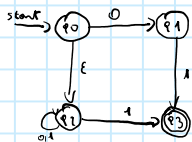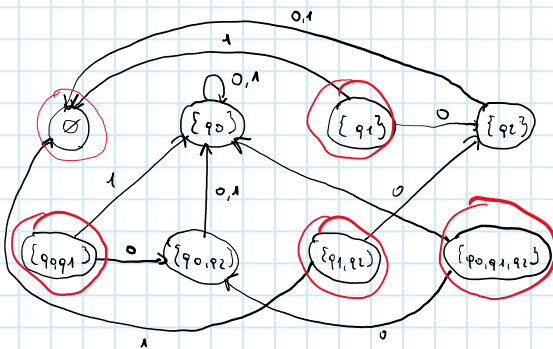$\delta_M(\{q_0,q_2\}, 0) = E(\delta_N(\{q_0\},0)) \cup E(\delta_N(\{q_2\},0)) = \{q_0\} \cup \{\varnothing\} = \{q_0\}$

$\delta_M(\{q_0,q_2\}, 1) = E(\delta_N(\{q_0\},1)) \cup E(\delta_N(\{q_2\},1)) = \{q_0\} \cup \{\varnothing\} = \{q_0\}$

$\delta_M(\{q_1,q_2\}, 0) = E(\delta_N(\{q_1\},0)) \cup E(\delta_N(\{q_2\},0)) = \{q_2\} \cup \{\varnothing\} = \{q_2\}$

$\delta_M(\{q_1,q_2\}, 1) = E(\delta_N(\{q_1\},1)) \cup E(\delta_N(\{q_2\},1)) = \{\varnothing\} \cup \{\varnothing\} = \{\varnothing\}$

$\delta_M(\{q_0,q_1,q_2\}, 0) = E(\delta_N(\{q_0\},0)) \cup E(\delta_N(\{q_1\},0)) \cup E(\delta_N(\{q_2\},0)) = \{q_0\} \cup \{q_2\} \cup \varnothing = \{q_0,q_2\}$

$\delta_M(\{q_0,q_1,q_2\}, 1) = E(\delta_N(\{q_0\},1)) \cup E(\delta_N(\{q_1\},1)) \cup E(\delta_N(\{q_2\},1)) = \{q_0\}, \{\varnothing\} = \{q_0\}$





Vogliamo convertire questo NFA in un DFA

DFA $M = (Q_M, \varepsilon, \delta_M, q_M, F_M)$

$Q_M = P(N)$

$\varepsilon = \{0,1\}$

$q_M = E(q_N) = \{q_0, q_2\}$

$\delta_M(R,a) = \bigcup_{r \in R} E(\delta_N(r,a))$

$\delta_M(\{q_0,q_2\}, 0) = E(\delta_N(q_0,0)) \cup E(\delta_N(q_2,0)) = \{q_1, q_2\}$

$\delta_M(\{q_0,q_2\}, 1) = E(\delta_N(q_0,1)) \cup E(\delta_N(q_2,1)) = \{q_2, q_3\}$

$\delta_M(\{q_1,q_2\}, 0) = E(\delta_N(q_1,0)) \cup E(\delta_N(q_2,0)) = \{q_2\}$

$\delta_M(\{q_1,q_2\}, 1) = E(\delta_N(q_1,1)) \cup E(\delta_N(q_2,1)) = \{q_2, q_3\}$

$\delta_M(\{q_2,q_3\}, 0) = E(\delta_N(q_2,0)) \cup E(\delta_N(q_3,0)) = \{q_2\}$

$\delta_M(\{q_2,q_3\}, 1) = E(\delta_N(q_2,1)) \cup E(\delta_N(q_3,1)) = \{q_2,q_3\}$