1) Sia dato il seguente automa riconoscitore a stati finiti nondeterministico:

$$M = (Q, \delta, q_0, F)$$

con alfabeto di ingresso $X = \{1, 2\}$, ove

$\partial (q_0, 1) = \{ q_1, q_2\}$	$\partial (q_0, 2) = \{ q_3\}$
$\partial (q_1, 1) = -$	$\partial (q_1, 2) = \{ q_3\}$
$\partial (q_2, 1) = \{ q_0, q_3\}$	$\partial (q_2, 2) = -$
$\partial (q_3, 1) = -$	$\partial (q_3, 2) = \{ q_3\}$

ed $F=\{ q_3\}$

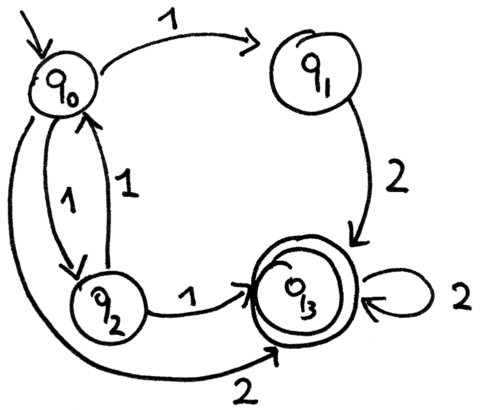
Determinare una grammatica lineare destra G che genera $T(M)$.

(PUNTI 3)

Costruire il diagramma di transizione di un automa a stati finiti deterministico equivalente ad M.

(PUNTI 7)

$M = (Q, \delta, q_0, F)$ $\quad X = \{1, 2\}$ $\quad Q = \{q_0, q_1, q_2, q_3\}$ $\quad F = \{q_3\}$



- $G = (X, V, S, P)$ $\quad V = Q$ $\quad X = \{1, 2\}$ $\quad S = q_0$

$P = \{ q \to x q' \mid q' \in \delta(q, x) \} \cup \{ q \to x \mid \delta(q, x) \in F \} \Rightarrow$

$P = \{ q_0 \to 1 q_1 \mid 1 q_2 \mid 2 q_3 \mid 2$

$q_1 \to 2 q_3 \mid 2$

$q_2 \to 1 q_0 \mid 1 q_3 \mid 1$

$q_3 \to 2 q_3 \mid 2 \}$

- $M' = (Q', \delta', q_0', F')$: $T(M') = T(M)$ $\quad X = \{1, 2\}$

$Q' = 2^Q = 2^{\{q_0, q_1, q_2, q_3\}}$

$q_0' = \{q_0\}$

$F' = \{\{q_3\}, \{q_0, q_3\}\}$

$\delta'(\{q_0\}, 1) = \delta(q_0, 1) = \{q_1, q_2\}$

$\delta'(\{q_0\}, 2) = \delta(q_0, 2) = \{q_3\}$

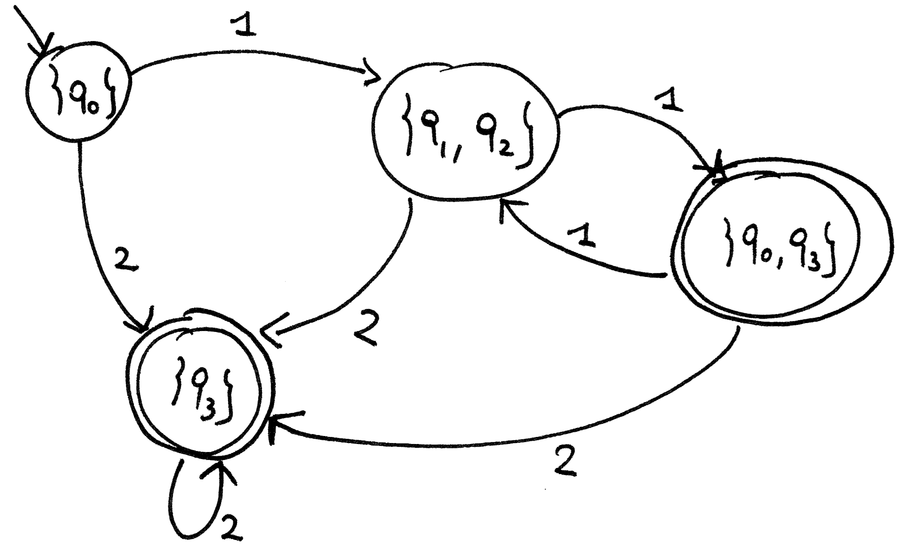
$\delta'(\{q_1, q_2\}, 1) = \delta(q_1, 1) \cup \delta(q_2, 1) = \{q_0, q_3\} \cup \emptyset = \{q_0, q_3\}$

$\delta'(\{q_1, q_2\}, 2) = \delta(q_1, 1) \cup \delta(q_2, 2) = \{q_3\} \cup \emptyset = \{q_3\}$

10

$$\delta'(\{q_0, q_3\}, 1) = \delta(q_0, 1) \cup \delta(q_3, 1) = \{q_1, q_2\} \cup \emptyset = \{q_1, q_2\}$$

$$\delta'(\{q_0, q_3\}, 2) = \delta(q_0, 2) \cup \delta(q_3, 2) = \{q_3\} \cup \{q_3\} = \{q_3\}$$



$$\delta'(\{q_3\}, 1) = \delta(q_3, 1)$$
$$= \emptyset$$

$$\delta'(\{q_3\}, 2) = \delta(q_3, 2)$$
$$= \{q_3\}$$