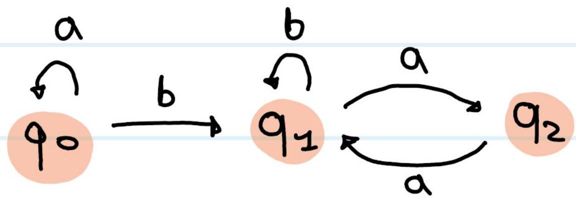
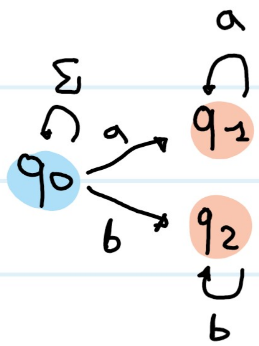
es. 1.2013

$\Sigma = \{a, b\}$



es. 2.2013

	a	b
$\rightarrow q_0$	$\{q_0, q_1\}$	$\{q_0, q_2\}$
$* q_1$	$\{q_1\}$	$\emptyset$
$* q_2$	$\{q_2\}$	$\emptyset$



(i) il codominio di δ è $\mathcal{P}(Q)$.

(ii) • $\hat{\delta}(q_0, \varepsilon) = \{q_0\}$

• $\hat{\delta}(q_0, a) = \delta(q_0, a) = \{q_0, q_1\}$

• $\hat{\delta}(q_0, ab) = \bigcup_{p \in \hat{\delta}(q_0, a)} \delta(p, b) = \delta(q_0, b) \cup \delta(q_1, b) =$

$= \{q_0, q_2\} \cup \emptyset = \{q_0, q_2\}$

• $\hat{\delta}(q_0, aba) = \delta(q_0, a) \cup \delta(q_2, a) =$

$= \{q_0, q_1\} \cup \emptyset = \{q_0, q_1\}$

• $\hat{\delta}(q_0, abaa) = \delta(q_0, a) \cup \delta(q_1, a) =$

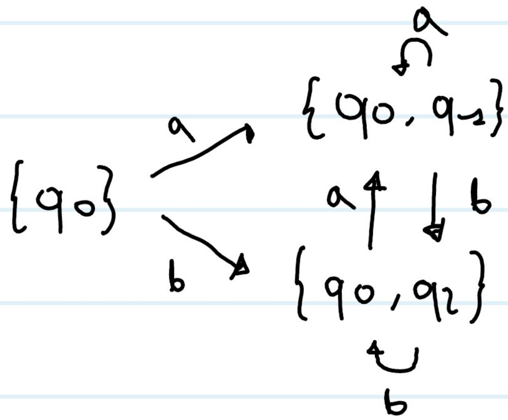
$= \{q_0, q_1\} \cup \emptyset = \{q_0, q_1\}$

- $\hat{\delta}(q_0, abaaa) = \delta(q_0, a) \cup \delta(q_1, a) =$
$= \{q_0, q_1\} \cup \emptyset = \{q_0, q_1\}$

$\hat{\delta}(q_0, abaaa) \cap F = \{q_1\} \neq \emptyset$, quindi abaaa è accettata.

(iii)

	a	b
$\rightarrow \{q_0\}$	$\{q_0, q_1\}$	$\{q_0, q_2\}$
$\{q_1\}$	$\emptyset$	$\emptyset$
$* \{q_2\}$	$\emptyset$	$\emptyset$
$\{q_0, q_1\}$	$\{q_0, q_1\}$	$\{q_0, q_2\}$
$* \{q_0, q_2\}$	$\{q_0, q_1\}$	$\{q_0, q_2\}$



es. 3.2013

Stato iniziale: $\{dim \rightsquigarrow K,\ c[0] \rightsquigarrow V_0, \dots\}$ con $K > 0$

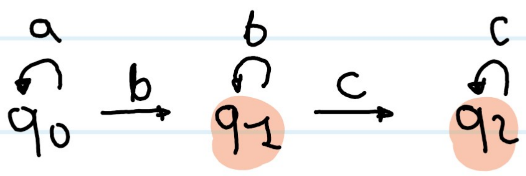
Stato finale: $\{$ massimo $\rightsquigarrow \max\{V_i \mid 0 \leq i < K\}$, minimo $\rightsquigarrow \min\{V_i \mid 0 \leq i < K\}$, coincidenti $\rightsquigarrow$

⇝ true se il valore di massimo e' uguale a quello di minimo, altrimenti false}

es. 1.2014

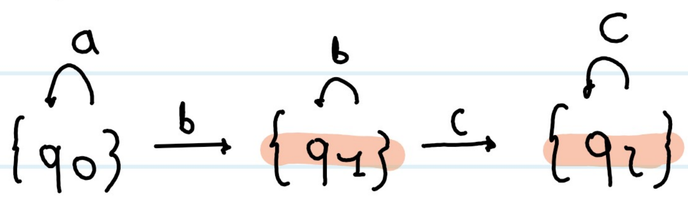
$L = \{a^n b^m c^k \mid n \geq 0, m > 0, k \geq 0\}$ $\Sigma = \{a, b, c\}$

(i)



(ii)

	a	b	c
→ $\{q_0\}$	$\{q_0\}$	$\{q_1\}$	$\emptyset$
* $\{q_1\}$	$\emptyset$	$\{q_1\}$	$\{q_2\}$
* $\{q_2\}$	$\emptyset$	$\emptyset$	$\{q_2\}$



es. 4.2014

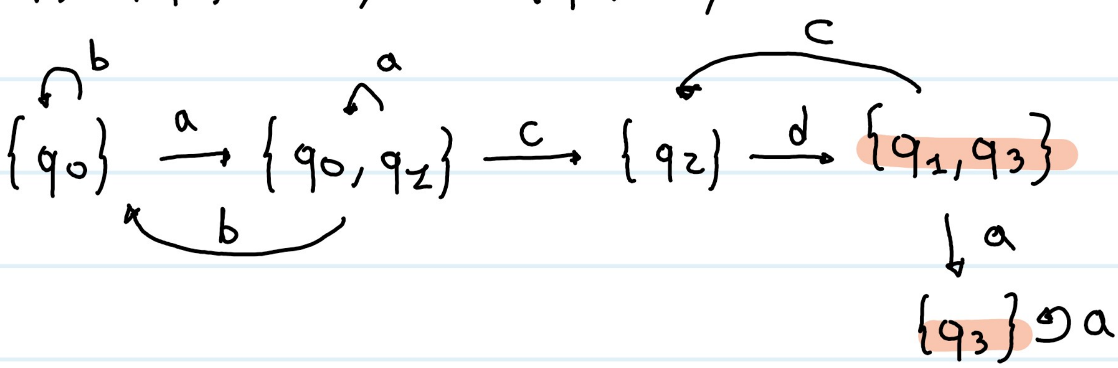
Stati iniziali: $\{dim \rightsquigarrow k, C[0] \rightsquigarrow V_0, \dots, C[k-1] \rightsquigarrow V_{k-1}, val \rightsquigarrow V\}$

Stati finali: $\{ occDisp \leadsto \#\{0 \leq i < k \mid V_i \equiv 1 \ (2)\},$ check $\leadsto$ true se il valore di occDisp è V, altrimenti false $\}$

es. 1.2015

$\Sigma = \{a, b, c, d\}$

	a	b	c	d
$\rightarrow \{q_0\}$	$\{q_0, q_1\}$	$\{q_0\}$	$\emptyset$	$\emptyset$
$\{q_1\}$	$\emptyset$	$\emptyset$	$\{q_2\}$	$\emptyset$
$\{q_2\}$	$\emptyset$	$\emptyset$	$\emptyset$	$\{q_1, q_3\}$
$* \{q_3\}$	$\{q_3\}$	$\emptyset$	$\emptyset$	$\emptyset$
$\{q_0, q_1\}$	$\{q_0, q_1\}$	$\{q_0\}$	$\{q_2\}$	$\emptyset$
$* \{q_1, q_3\}$	$\{q_3\}$	$\emptyset$	$\{q_2\}$	$\emptyset$



es. 5. 2015

Stato iniziale: $\{ dim \rightsquigarrow k,\ c[0] \rightsquigarrow v_0, \dots, c[k-1] \rightsquigarrow v_{k-1} \}$

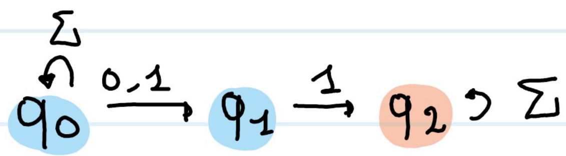
con $k > 0$

Stato finale: $\{ count \rightsquigarrow \# \{ 0 \leq i < k \mid v_i \equiv 0\ (2) \}$,

check $\rightsquigarrow$ true se k è il doppio del valore di count, altrimenti false$\}$

es. 1. 2018

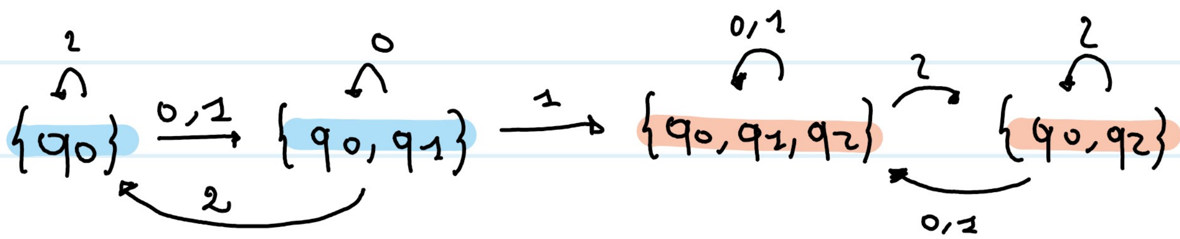
(i)

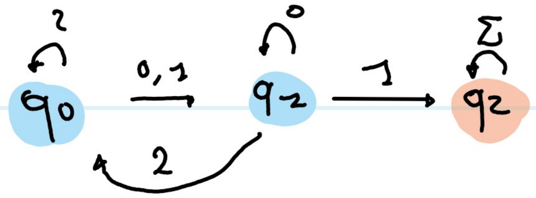


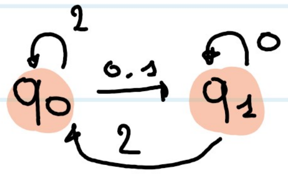
$\Sigma = \{0, 1, 2\}$

(ii)

	0	1	2
$\to \{q_0\}$	$\{q_0, q_1\}$	$\{q_0, q_1\}$	$\{q_0\}$
$\{q_1\}$	$\emptyset$	$\{q_2\}$	$\emptyset$
$* \{q_2\}$	$\{q_2\}$	$\{q_2\}$	$\{q_2\}$
$\{q_0, q_1\}$	$\{q_0, q_1\}$	$\{q_0, q_1, q_2\}$	$\{q_0\}$
$* \{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_2\}$
$* \{q_0, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_2\}$



(equiv. a )

(iii) 

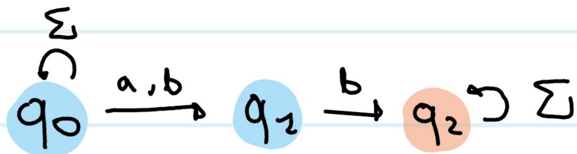
es. 5. 2018

(i) $$\frac{\langle b_0, \sigma\rangle \longrightarrow true \qquad \langle b_1, \sigma\rangle \longrightarrow true}{\langle b_0 \wedge b_1, \sigma\rangle \longrightarrow true}$$

$$\frac{\langle b_0, \sigma\rangle \longrightarrow t_1 \qquad \langle b_1, \sigma\rangle \longrightarrow t_2}{\langle b_0 \wedge b_1, \sigma\rangle \longrightarrow false}$$ se almeno uno fra t_1 e t_2 e' false

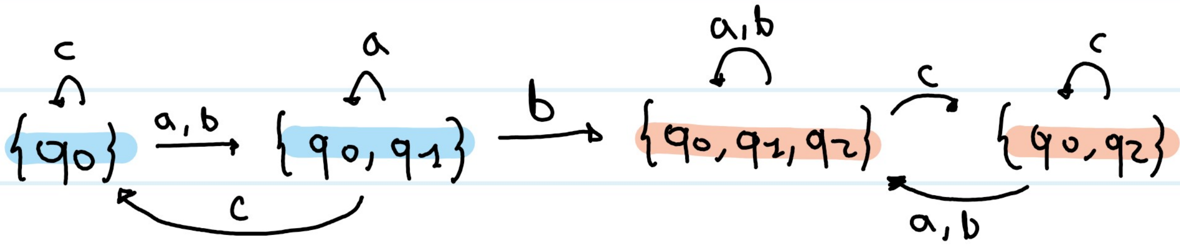
(ii) $$\frac{\langle b_0, \sigma\rangle \longrightarrow false}{\langle b_0 \wedge b_1, \sigma\rangle \longrightarrow false} \qquad \frac{\langle b_0, \sigma\rangle \longrightarrow true \quad \langle b_1, \sigma\rangle \longrightarrow t_1}{\langle b_0 \wedge b_1, \sigma\rangle \longrightarrow t_1}$$

es. 1. 2019

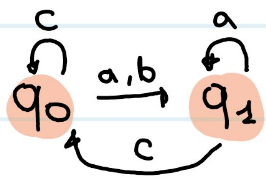
(i) 

(ii)

		a	b	c
$\rightarrow$	$\{q_0\}$	$\{q_0, q_1\}$	$\{q_0, q_1\}$	$\{q_0\}$
	$\{q_1\}$	$\emptyset$	$\{q_2\}$	$\emptyset$
*	$\{q_2\}$	$\{q_2\}$	$\{q_2\}$	$\{q_2\}$
	$\{q_0, q_1\}$	$\{q_0, q_1\}$	$\{q_0, q_1, q_2\}$	$\{q_0\}$
*	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_2\}$
*	$\{q_0, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_2\}$



(iii)



es. 5.2019

(i)

$$\frac{\langle a_0, \sigma \rangle \rightarrow n_0 \qquad \langle a_1, \sigma \rangle \rightarrow n_1}{\langle a_0 + a_1, \sigma \rangle \rightarrow n_0 + n_1}$$

(ii)

$$\frac{\dfrac{\langle Y, \sigma_0 \rangle \rightarrow 1 \qquad \langle 3, \sigma_0 \rangle \rightarrow 3}{\langle Y + 3, \sigma_0 \rangle \rightarrow 4} \qquad \dfrac{\langle 4, \sigma_0 \rangle \rightarrow 4 \qquad \langle 2, \sigma_0 \rangle \rightarrow 2}{\langle 4 + 2, \sigma_0 \rangle \rightarrow 6}}{\langle (Y+3) + (4+2), \sigma_0 \rangle \rightarrow 10}$$

es. 2. 2019

```
# include <stdio.h>

int read_seq() {
    int n = 1;
    int last; scanf("%d", &last);
    int valid_seq = TRUE; int current;

    while(valid_seq) {
        scanf("%d", &current);
        n++;

        if (last == current+1) {
            valid_seq = FALSE;
        }

        last = current;
    }

    return n;
```

```
}
```

es. 3. 2019

```
int check_arr(int a[], int dim) {
    int valid = TRUE;
    int i = 0;

    while (valid && i < dim) {
        if (a[i+1] != 2 * a[i] || a[i+2] != 3 * a[i]) {
            valid = FALSE;
        }

        i += 3;
    }

    return valid;
}
```