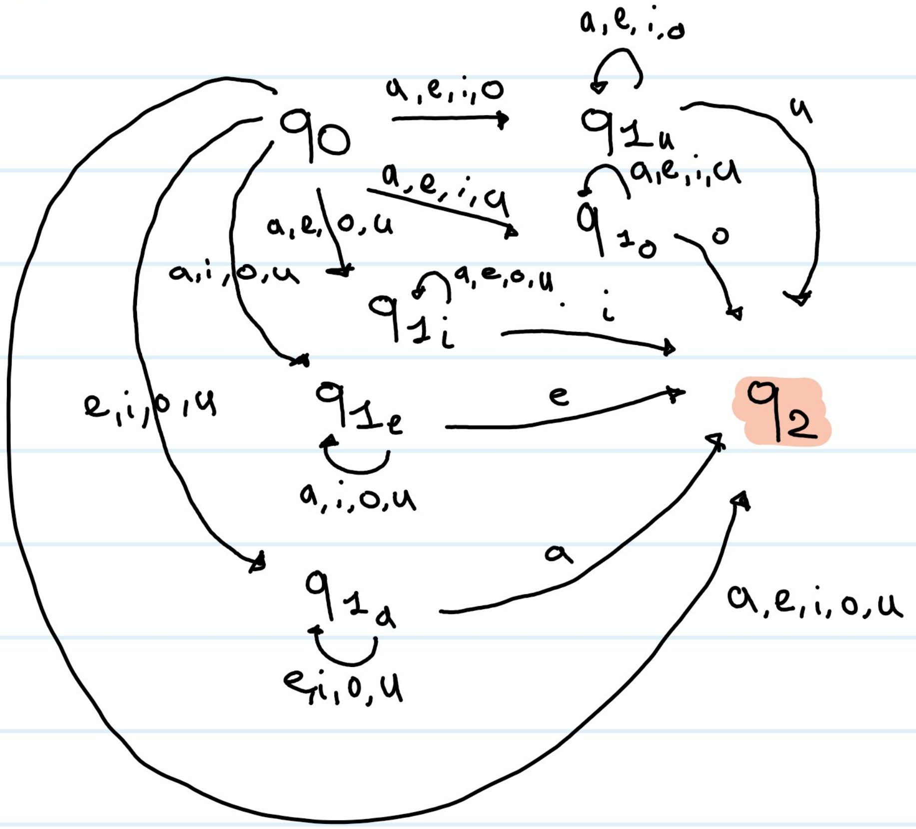
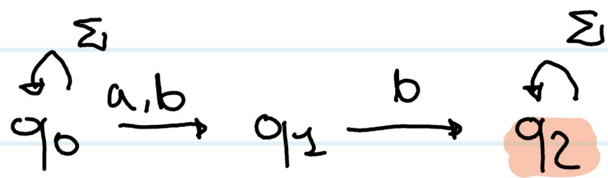
es. $\Sigma = \{a, e, i, o, u\}$ la vocale finale **non** sia uscita



es. 1. 2019

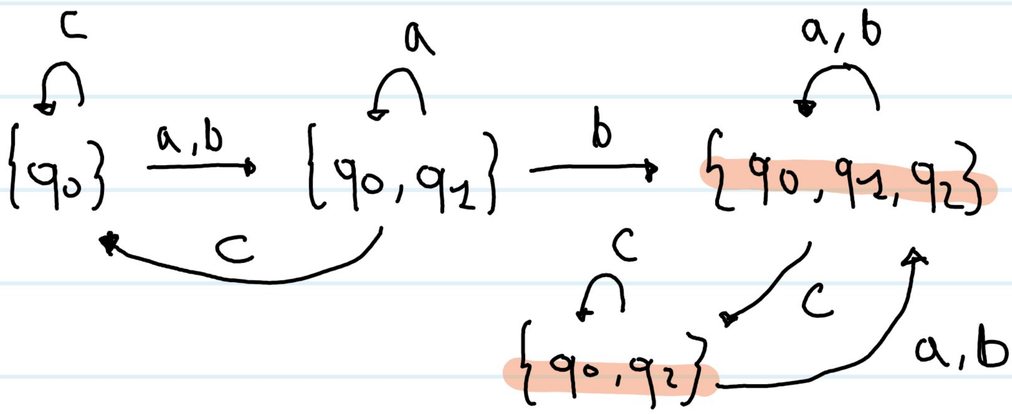
(a.) $\Sigma = \{a, b, c\}$



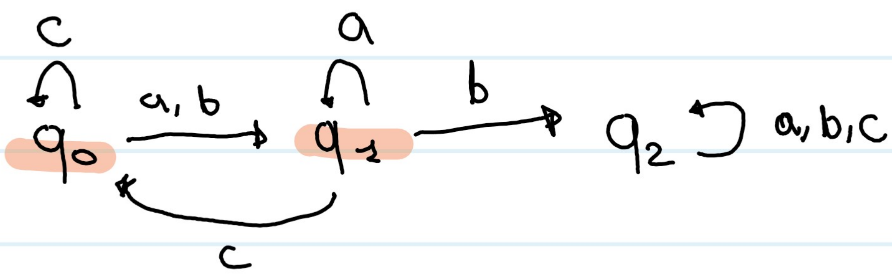
(b.)

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

*	$\{q_2\}$	$\{q_2\}$	$\{q_2\}$	$\{q_2\}$
	$\{q_0, q_1\}$	$\{q_0, q_1\}$	$\{q_0, q_1, q_2\}$	$\{q_0\}$
*	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_2\}$
*	$\{q_0, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_2\}$



(c.) $\Sigma = \{a, b, c\}$



es 2.2019

```
#include <stdio.h>

int sequenza(void) {
```

```
int last; int PREDECESSORE = FALSE,
scanf("%d", &last);

int current; int i = 1;

while (!PREDECESSORE) {
    scanf("%d", &current);
    i++;

    if (current == last - 1) {
        PREDECESSORE = TRUE;
    }

    last = current;
}

return i;
}
```

es. 5.2019

(i)
$$\frac{\langle a_0, \sigma\rangle \to n_1 \quad \langle a_1, \sigma\rangle \to n_2}{\langle a_0 + a_1, \sigma\rangle \to n_1 + n_2}$$

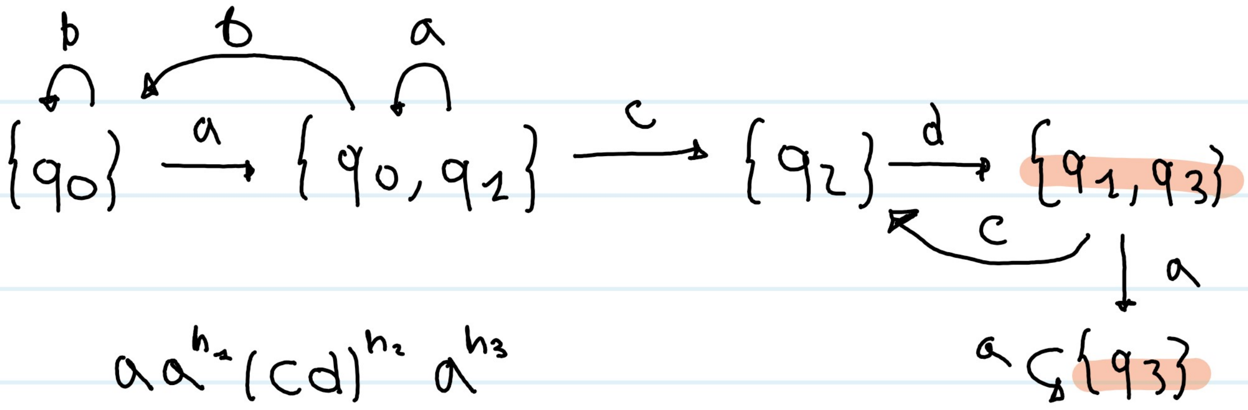
(ii) $a = (Y+3) + (4+2) \quad \sigma_0(Y) = 1$

$$\cfrac{\cfrac{\langle Y, \sigma_0\rangle \to 1 \quad \langle 3, \sigma_0\rangle \to 3}{\langle Y+3, \sigma_0\rangle \to 4} \quad \cfrac{\langle 4, \sigma_0\rangle \to 4 \quad \langle 2, \sigma_0\rangle \to 2}{\langle 4+2, \sigma_0\rangle \to 6}}{\langle (Y+3) + (4+2), \sigma_0\rangle \to 10}$$

es. 1.2017

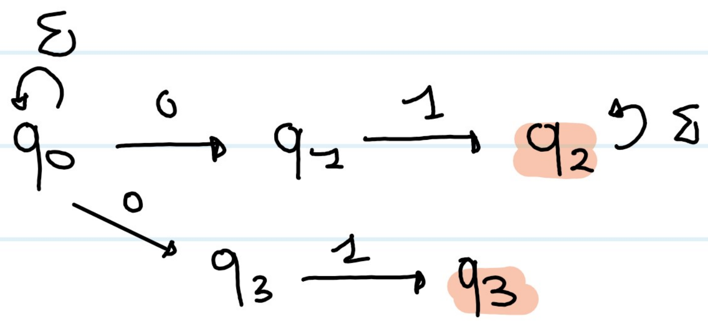
(ii)

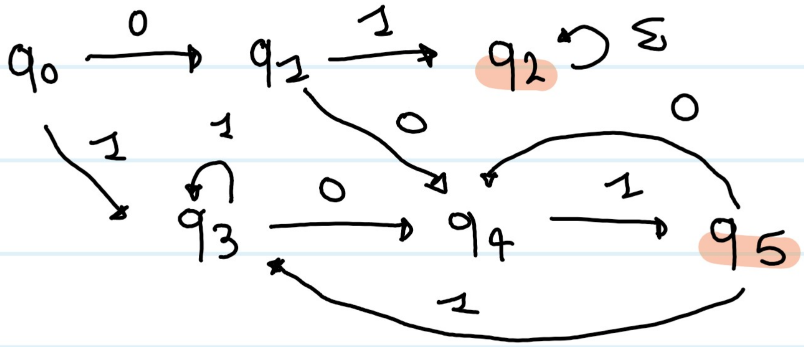
	a	b	c	d
$\to \{q_0\}$	$\{q_0, q_1\}$	$\{q_0\}$	$\emptyset$	$\emptyset$
$\{q_1\}$	$\emptyset$	$\emptyset$	$\{q_2\}$	$\emptyset$
$\{q_2\}$	$\emptyset$	$\emptyset$	$\emptyset$	$\{q_1, q_3\}$
$* \{q_3\}$	$\{q_3\}$	$\emptyset$	$\emptyset$	$\emptyset$
$\{q_0, q_1\}$	$\{q_0, q_1\}$	$\{q_0\}$	$\{q_2\}$	$\emptyset$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



$aa^{n_1}(cd)^{n_2}a^{n_3}$

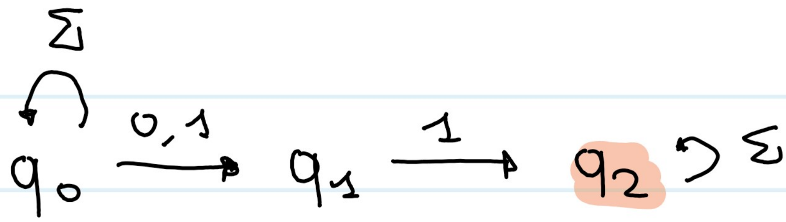
es.





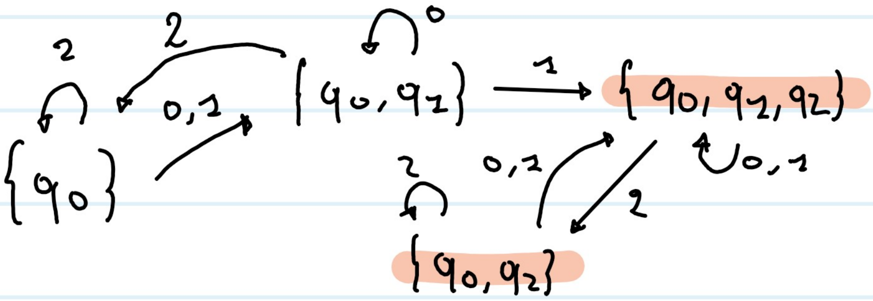
es. 1.2018

(i) $x01y \lor x11y \quad L = \{0,1,2\}^*$

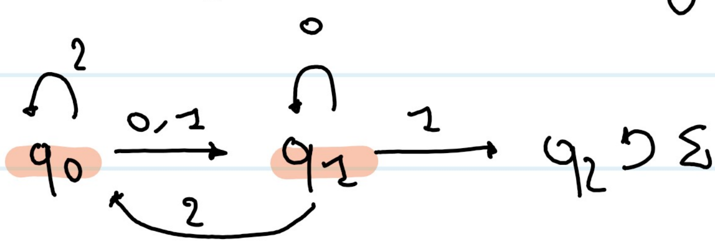


(ii)

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



(iii) $\neg\, x01y \wedge \neg\, x11y$



es. 2.2012 $\Sigma = \{0, 1, 2\}$

$L = \{ w \in \Sigma^* \mid w = x2, x \in \Sigma^* \}$

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

(i) $q_0 \in \hat{\delta}(q_0, w) \ \forall w \in \Sigma^*$:

- $q_0 \in \hat{\delta}(q_0, \varepsilon)$ base
- $\hat{\delta}(q_0, xa) = \bigcup_{p \in \hat{\delta}(q_0, x)} \hat{\delta}(p, a) \underbrace{\supseteq}_{\substack{q_0 \in \hat{\delta}(q_0, x) \\ \text{per il passo} \\ \text{induttivo}}} \hat{\delta}(q_0, a) \ni q_0$

(ii) $q_1 \in \hat{\delta}(q_0, w2) \ \forall w \in \Sigma^*$:

- $\hat{\delta}(q_0, w2) = \bigcup_{p \in \hat{\delta}(q_0, w)} \hat{\delta}(p, 2) \underbrace{\supseteq}_{\text{per (i)}} \hat{\delta}(q_0, 2) \ni \underset{\in F}{q_1} \Rightarrow \hat{\delta}(q_0, w2) \cap F \neq \emptyset$

(iii) $q_1 \notin \hat{\delta}(q_0, w0) \land q_1 \notin \hat{\delta}(q_0, w1) \ \forall w \in \Sigma^*$:

- $\hat{\delta}(q_0, w) \subset \{q_0, q_1\} \Rightarrow \hat{\delta}(q_0, w0) \subset \{q_0\} \not\ni$
  $\not\ni q_1 \Rightarrow \hat{\delta}(q_0, w0) \cap F = \emptyset$
- $\hat{\delta}(q_0, w) \subset \{q_0, q_1\} \Rightarrow \hat{\delta}(q_0, w1) \subset \{q_0\} \not\ni$
  $\not\ni q_1 \Rightarrow \hat{\delta}(q_0, w1) \cap F = \emptyset$

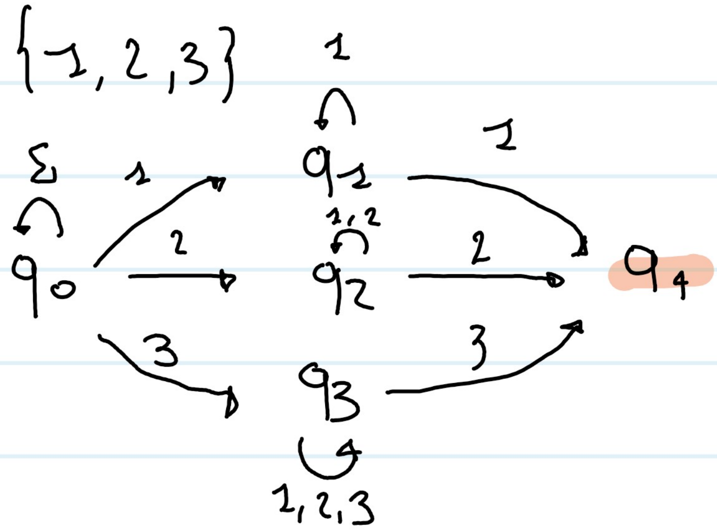
Quindi $L(A) = L$. $\boxtimes$

es. 4.2012

```
#define TRUE 1
#define FALSE 0


int are_coprime(int a, int b) {
    int coprime = TRUE ;
    int min = a>b ? b : a;
    int max = a>b ? a : b;

    for(int i=2; i<=min && coprime; i++) {
        if (min % i ==0 && max % i ==0) {
            coprime = FALSE;
        }
    }

    return coprime;
}
```

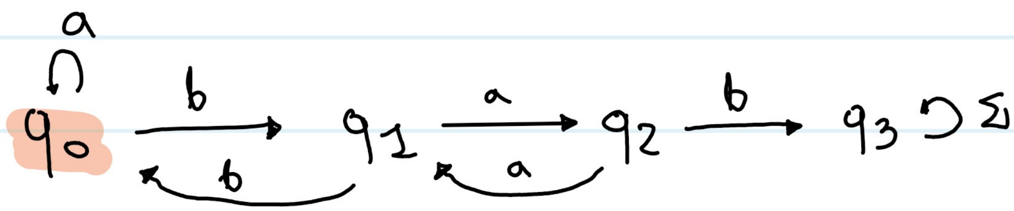
es. 1. 2012

$\Sigma = \{1, 2, 3\}$



es. 1. 2013

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



es. 4. 2013

```
char maxvolte (int v[], int dim) {
        int f[26] = {0}
        char m = v[0];

        for(int i=0; i<dim-1; i++) {
```

```
        if (v[i] - v[i+1] == 1 && ++f[v[i]] >
            f[m]) {
            m = v[i];
        }
    }

    return m;
}
```