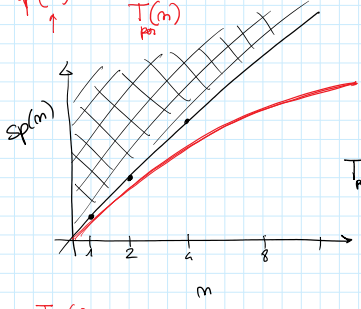


$$\text{Speedup}(m) = \frac{T_{seq}}{T_p(m)}$$



stream di istruzioni (D-RISC)

l'istruzione viene completamente eseguita prima di passare alla prossima

$$T_p(m) = T_{distribuzione} + T_{controllo} + T_{ricezione}$$

$\approx \frac{T_{seq}}{m}$

Overhead

efficienza

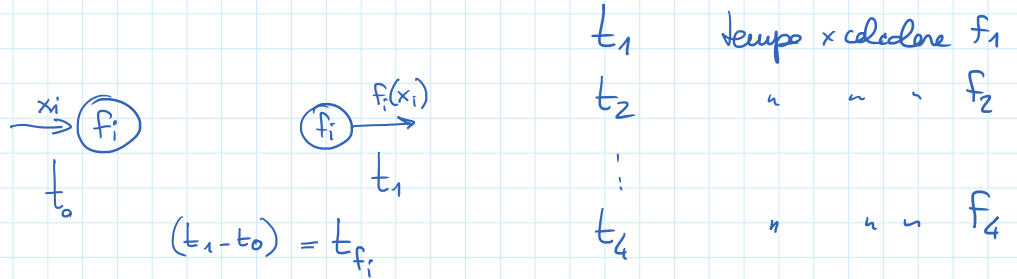
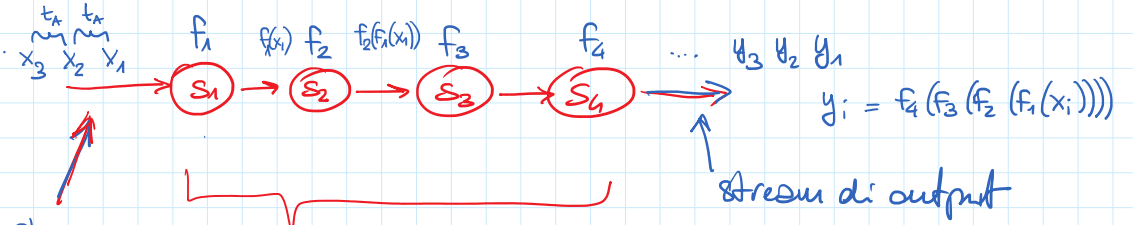
$$E(m) = \frac{T_{id}(m)}{T_p(m)}$$

$$T_{id}(m) = \frac{T_{seq}}{m}$$

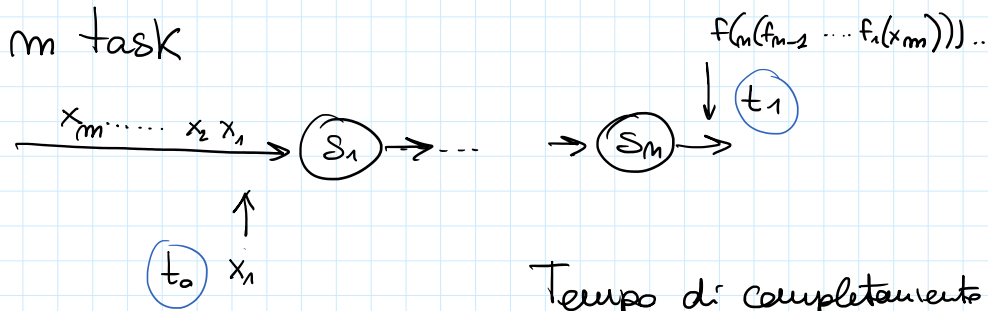
$$E(m) = \frac{T_{seq}}{m} = \frac{\text{speedup}(m)}{m}$$

$$sp(m) = \frac{T_{seq}}{n}$$

PIPELINE

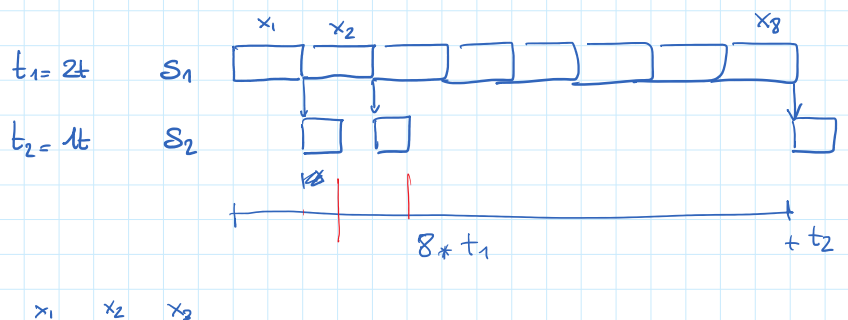
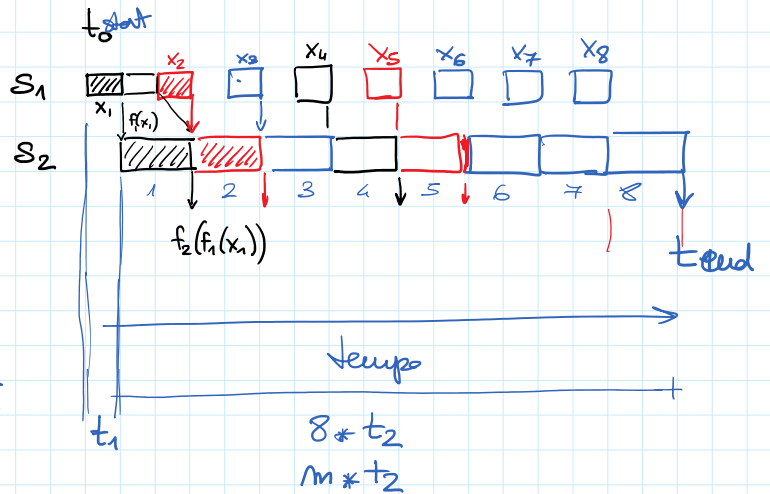
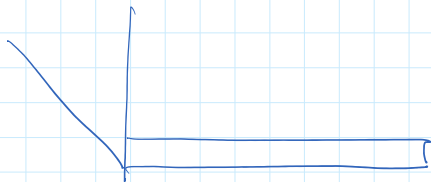


n stadi } stadio i calcolo $f_i()$ in t_i
 ↑
 latenza



Tempo di completamento di m task

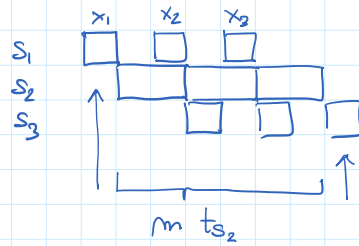
$m=2$ $t_1=1t$
 $m=8$ $t_2=2t$



$8 * t_1$

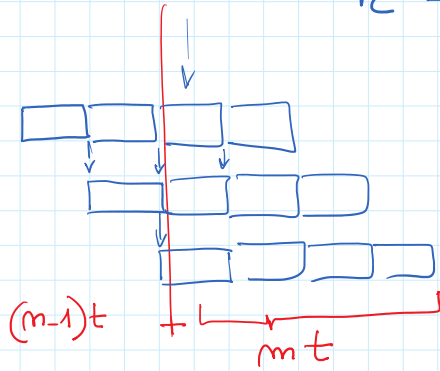
$+ t_2$

$t_1 = 1t$
 $t_2 = 2t$
 $t_3 = 1t$



$$T_c = m * (\max\{t_{s_i}\}) + \sum_{j \neq \max} t_{s_j}$$

$t_{s_i} = t_{s_j}$

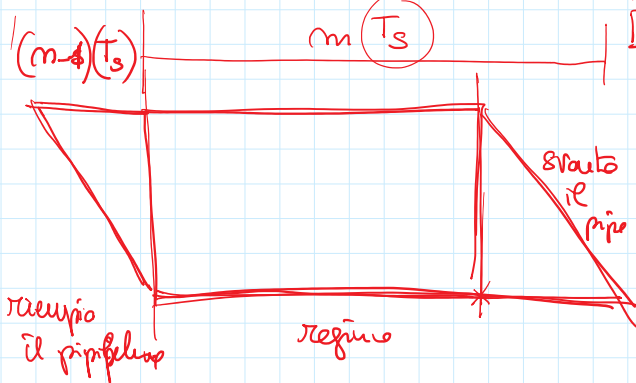
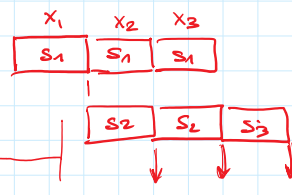
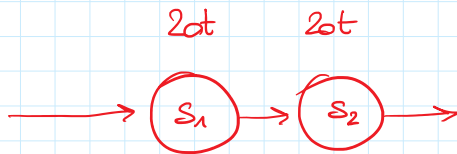
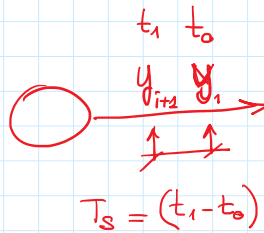


$$T_c^{(m)} = \underline{(m-1)t} + \boxed{m(t)} \quad ||$$

$$T_{seq} = m * \underbrace{(m \cdot t)}_{\substack{\text{tempo } \times \\ \text{calcolo } s_3(s_2(s_1(x_i)))}} \quad ||$$

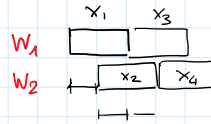
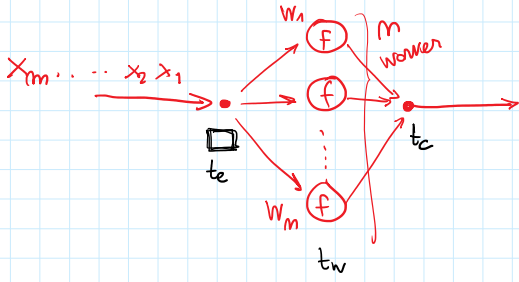
$$m = \frac{sp(m)}{T_c(m)} = \frac{T_{seq}}{T_c(m)} = \frac{m(m \cdot t)}{((m-1)+m)t}$$

T_s tempo di servizio

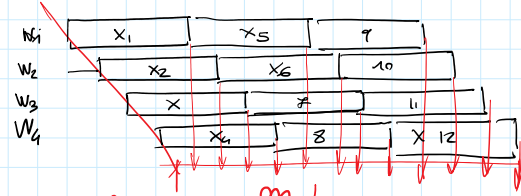


$$t_s = 2ot = \max\{T_{s_i}\}$$

FARM (REPLICAZIONE FUNZIONALE)



$$t_e = \frac{t_w}{m}$$



$$(m-1)t_e + \frac{m}{m}t_w$$

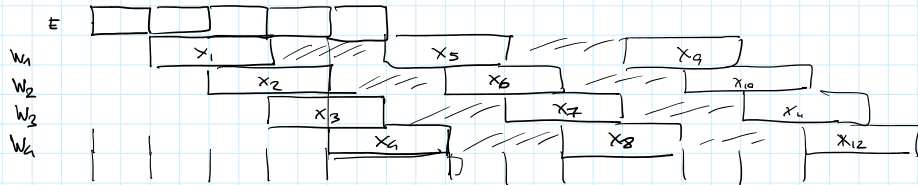
$$T_{seq} = mt_w$$

$$\left. \begin{matrix} \\ \\ \end{matrix} \right\} t_e = \frac{t_w}{m}$$

$$T_S(m) = t_e$$

$$t_e = 2t$$

$$t_w = 4t$$

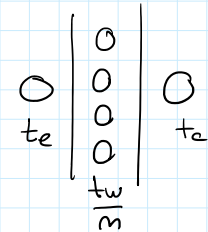


$$8t$$

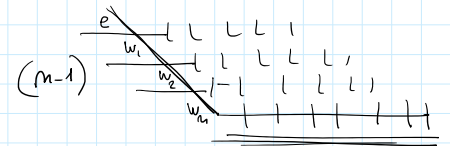
$$8t + 3t_w$$

$$mt + \frac{(m)}{m}t_w$$

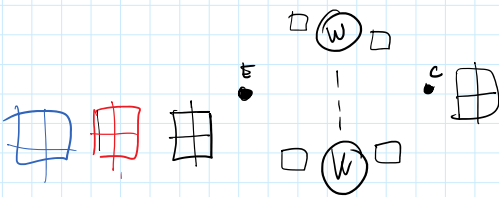
$$T_S = \max \left\{ t_e, t_c, \frac{t_w}{m} \right\}$$

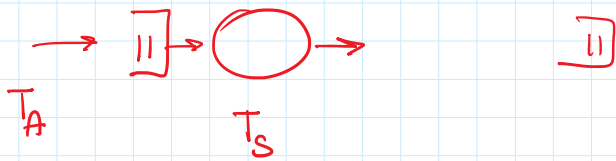


$$T_C = \underbrace{(m-1)}_{\downarrow} t_s + \frac{m}{m} t_s$$



MAP





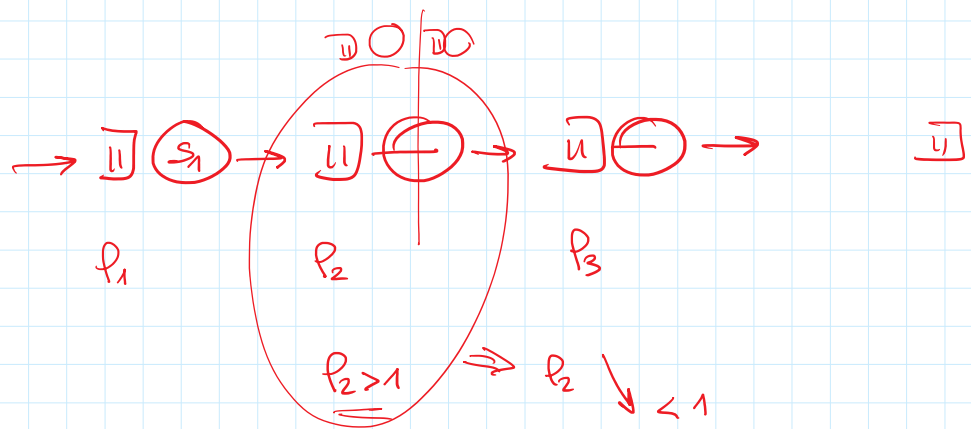
$$P \approx 1$$

$$P = \frac{T_S}{T_A}$$

$T_S \approx T_A \Rightarrow$ code vuoto

fattore di utilizzo della code

$T_S > T_A \Rightarrow$ code e' piena



while (true) {
 fetch
 decode
 exec
 int
}

do, chi
op → R
xxx₀ xxx₁ ...

