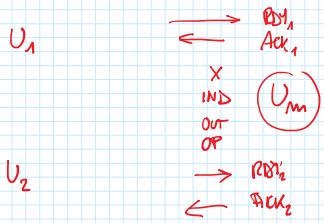
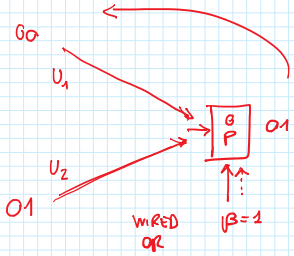
INTERFACCE VERSO UNITÀ DIVERSE

venerdì 25 novembre 2016 11:08





RDY1
ACK1
OP1
X1
IND1
OUT1

decido di servire U_1

controllo rendez

1

X_1

X_2

K → X

$ACK_2 = 1$ ($T=0$) $X_1 \rightarrow M[IND_1]$ reset RDY_1, set ACK_1 ...

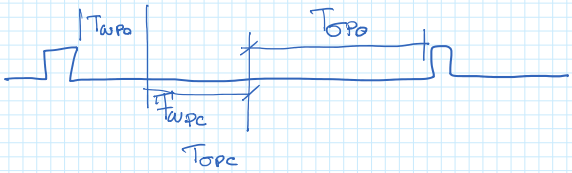
$= 1$) $X_2 \rightarrow M[IND_2]$

$\emptyset$. (RDY_1, RDY_2 T =)

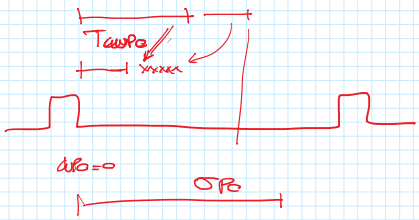
$OP_1 \rightarrow OP$, $X_1 \rightarrow X$, $IND_1 \rightarrow IND$ ...

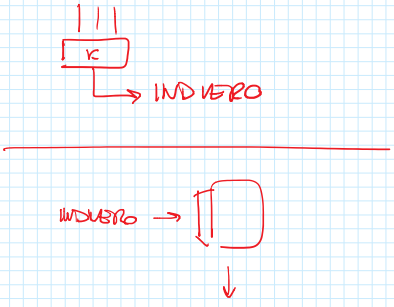
minimizzare τ

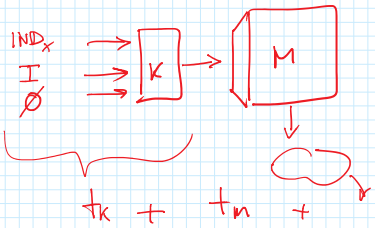
$(M[I] == x) \rightarrow \tau$

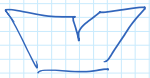


1. (OP = O0 O1 ...









M[I] == x

talu

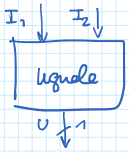
zero (M[I] - x)

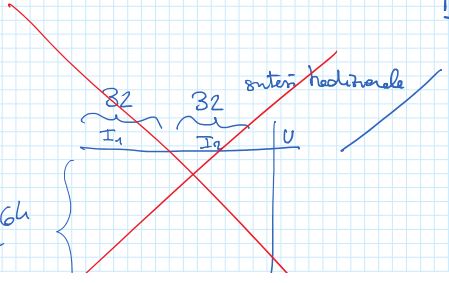
tk+ta

tk+ta +talu

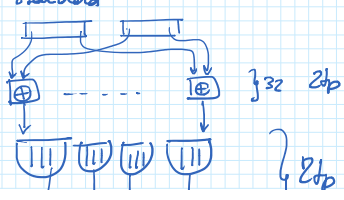
2tp 6tp 15tp

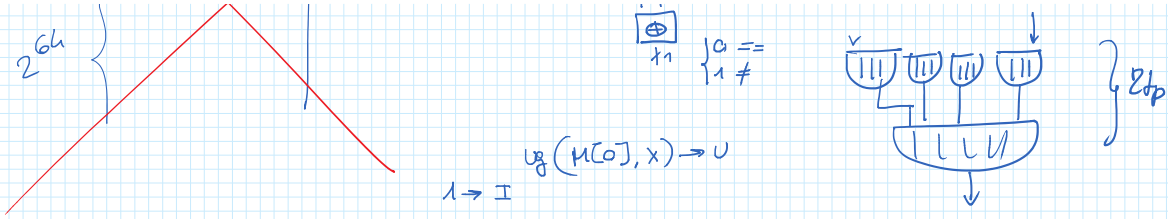
23tp





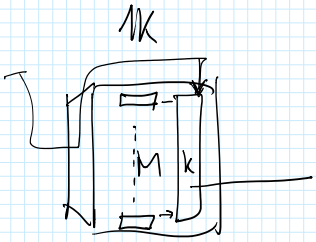
componenti standard





i. (Z) $I+1 \to I$, $uguale(M[I], x) \to Z$

t_{alu} 15tp $4t_p + t_k + t_a$ $\approx 12t_p$



2^{10} ingressi + 10 ingressi di controllo

$i_0\ i_1\ i_2 \dots i_9$	$r_0\ r_1\ r_2 \dots r_{1023}$	Z
000 0	r_0^1 — — —	r_0^1
000 ...01	— r_1 — —	r_1
000 ...10	— — r_2 —	r_2

1K

livello AND : 10+1 ingressi

livello OR

1K ingressi

$$\left\lceil \frac{\log_2 1K}{\log_2 8} \right\rceil = \lceil 3.\dots \rceil = 4 \Rightarrow 4t_p$$

10

3

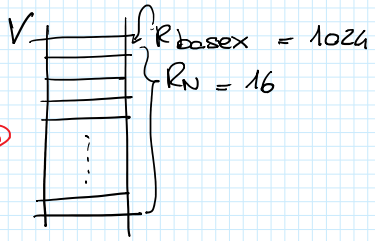
$\lceil \log_8 1K \rceil$

ESERCIZI su CACHE e MEMORIA

venerdì 25 novembre 2016 11:45

RICERCA di un elemento in un vettore R_x

↳ TRACCIA degli INDIRIZZI GENERATI verso M ?



dim pag M = 4K
OFF = 12 bit

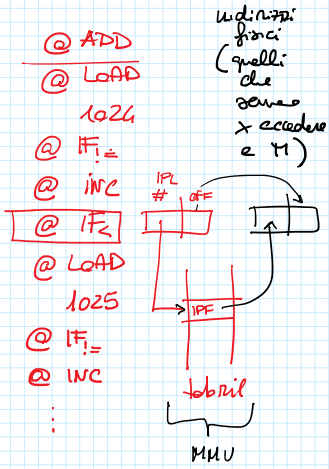
```
trovato = false
for(i=0; i<N; i++)
    if(x == V[i]) { trovato = true;
                    break; }
```

```
        ADD   R0, R0, Rtrovato
loop :  LOAD  Rbasex, Ri, Rvi
        IF!=  Rx, Rvi, cont
then :  ADD   Rtrovato, #1, Rtrovato
        GOTO  fineciclo
cont :  INC   Ri
        IF<   Ri, RN, loop
fineciclo : END
```

che IR
ch1
che ch1 legge load1

IR → IND "fetch" → OP set RDYm

Indirizzi logici

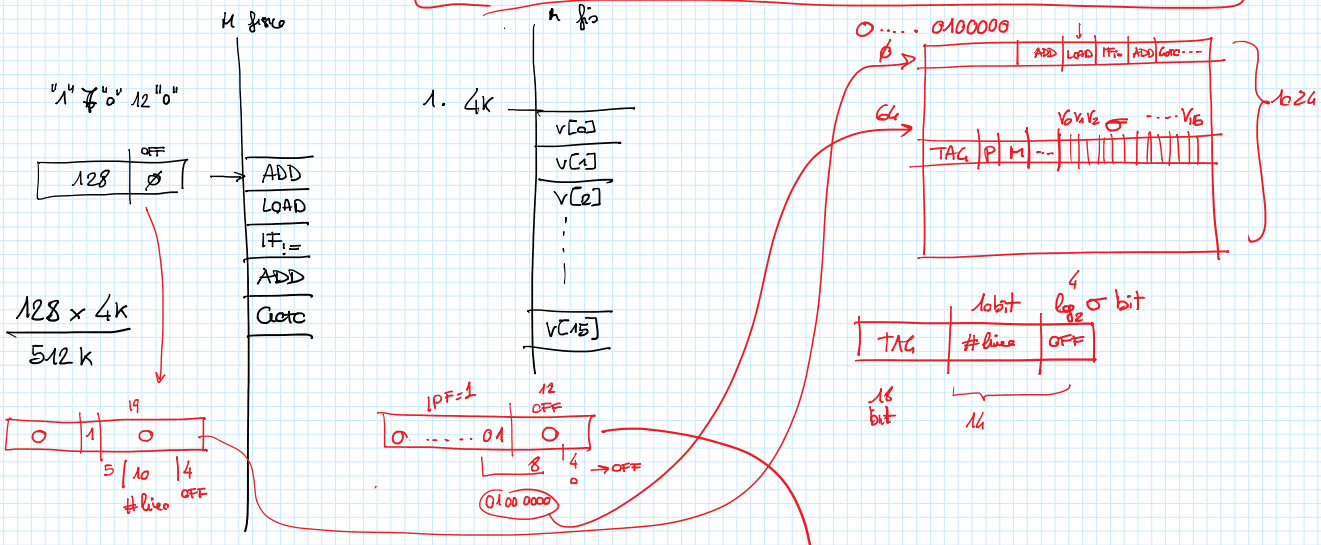


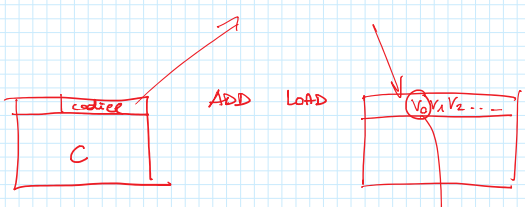
tab pil

inizio codice	IPL = 5	IPF = 128
dati	IPL = 6	IPF = 1

Sia gli accessi dati che codice vanno in un unico cache C
1024 linee indirizzamento diretto σ=16

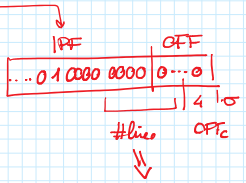
$2^7\ 2^6\ 2^5\ 2^4\ 2^3\ 2^2\ 2^1\ 2^0$
$1\ 0\ 0\ 0\ 0\ 0\ 0$





IPF = ~~1~~

256 sarebbe stato



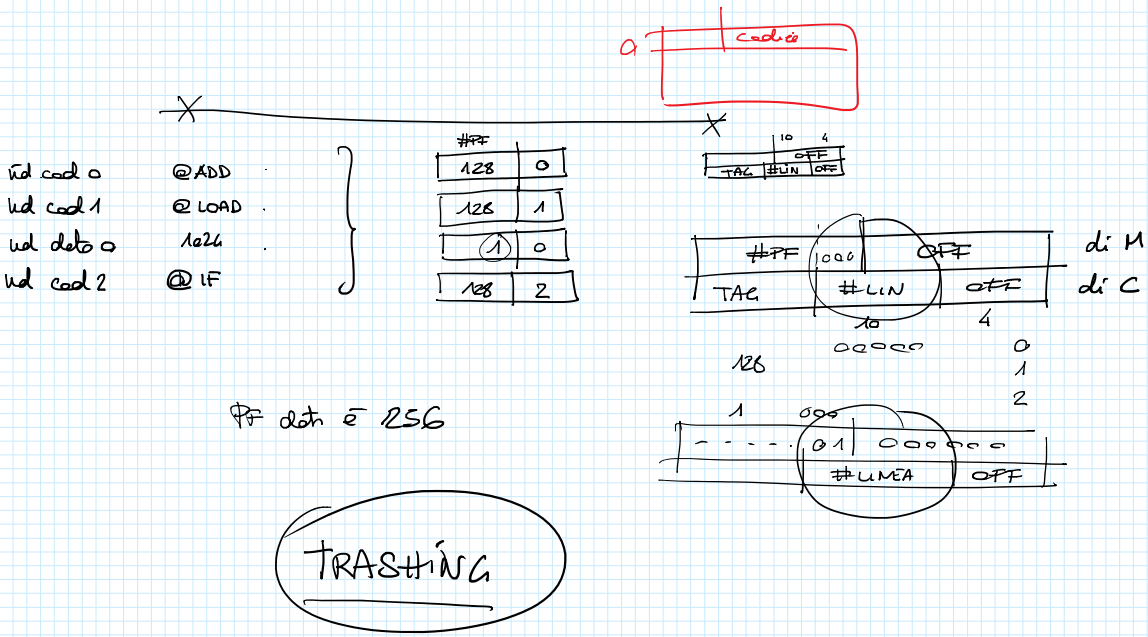
0

FAULT di cache → linea 0 !

Rvi (load1) ch0

128	1

fault



#PF dato è 256

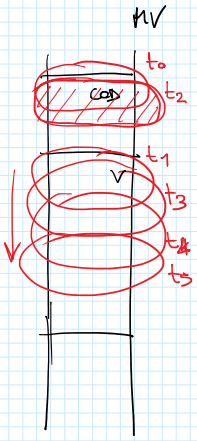
TRASHING

CALCOLO del WORKING SET

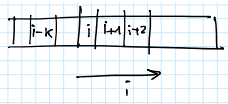
venerdì 25 novembre 2016 12:34

— ricerca di un elemento nel vettore

```
for (i=0; i<N; i++)
    if (v[i] == x) { ... }
```



loop sempre nel WS dopo l'inizializzazione



nel WS

— codice (del corpo del ciclo)

— porzione di vettore dalla posizione i in poi

ad ogni singolo istante il WS è → il codice (del corpo del ciclo)

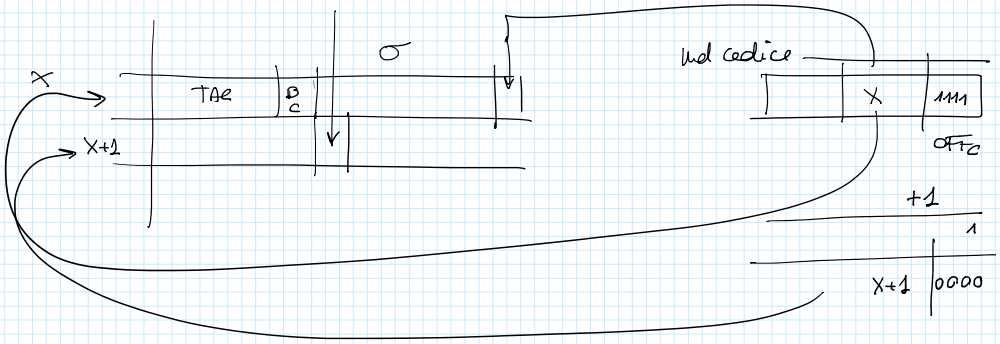
la parte di vettore che segue Vi e include Vi

#fault

1 fault x codice (< σ istruzioni)

1° fault	V_0 V_1 - - - - V_{15}	$\frac{N}{\sigma}$ 1 fault iniziale
1 fault	V_{16} V_{17} - - - V_{31}	
1 fault	V_{32} - - - - V_{47}	

LOAD ....., prefetch



$\forall i \Rightarrow$ `x[i] = a[i] + b[i];`

1 linea — codice

— 3 pezzi di vettore

3 linea