

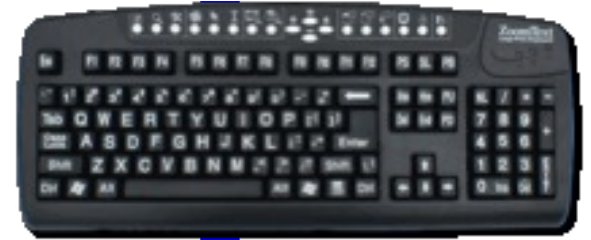
Fondamenti di Elaborazione dei Dati Digitali

Lezione 4

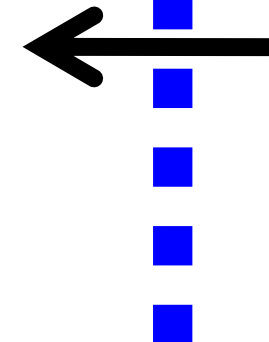
Mario Verdicchio

Università degli Studi di Bergamo

A.A. 2026-2027



Periferiche di input





**Periferiche
di output**



Periferiche di input e output

Wii controller
(Nintendo)



PS3 Dual Shock
controller (Sony)



iPhone touch
screen (Apple)



USB stick
(Lacie)



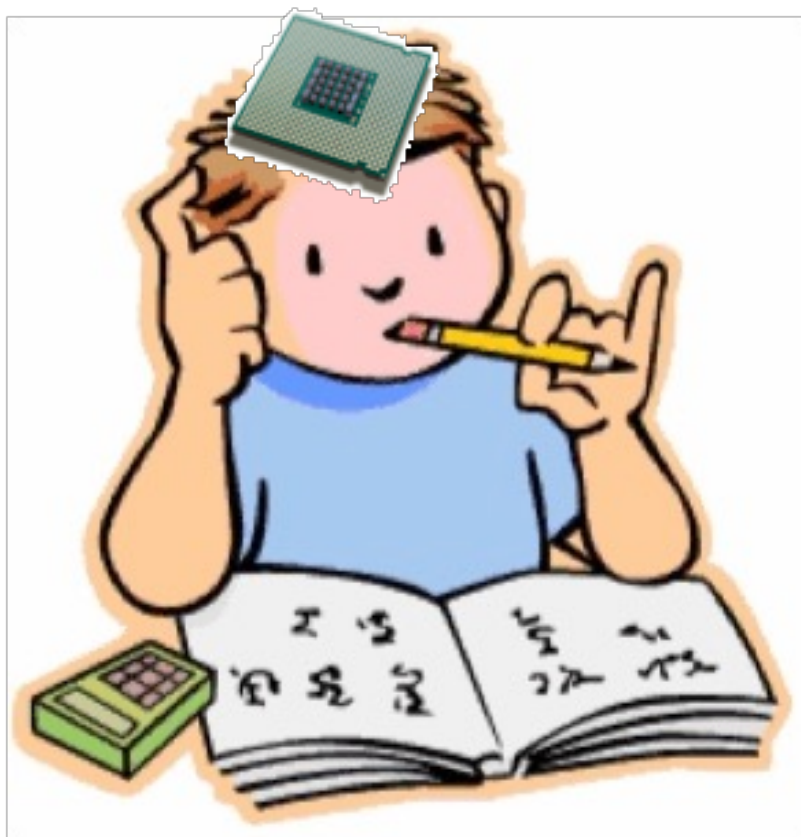
External Hard
Disk (WD)



Hardware



Noto in italiano come “processore”, la CPU (Central Processing Unit) è la parte del computer che esegue le operazioni.



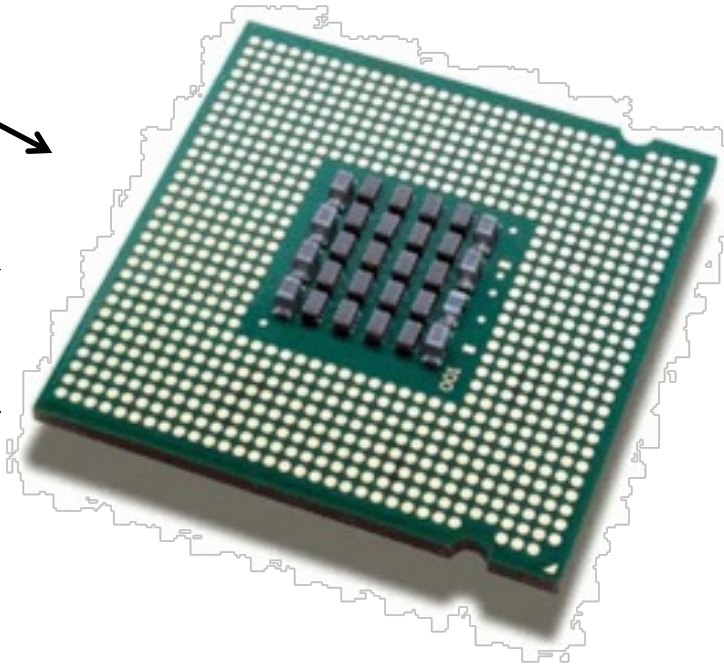
CPU

La CPU è fatta di due parti:
la ALU (Arithmetic-Logical Unit) esegue le operazioni
aritmetiche e logiche.

3

+

5

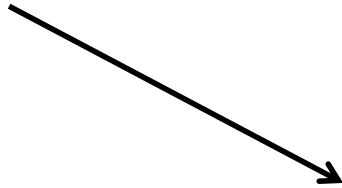


8

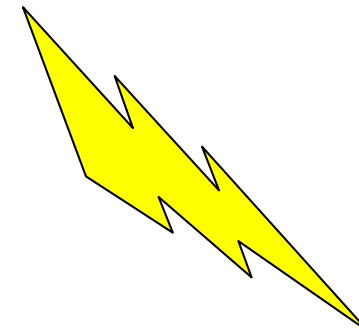
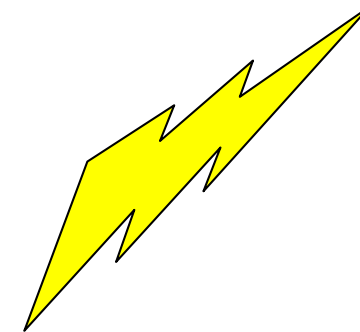
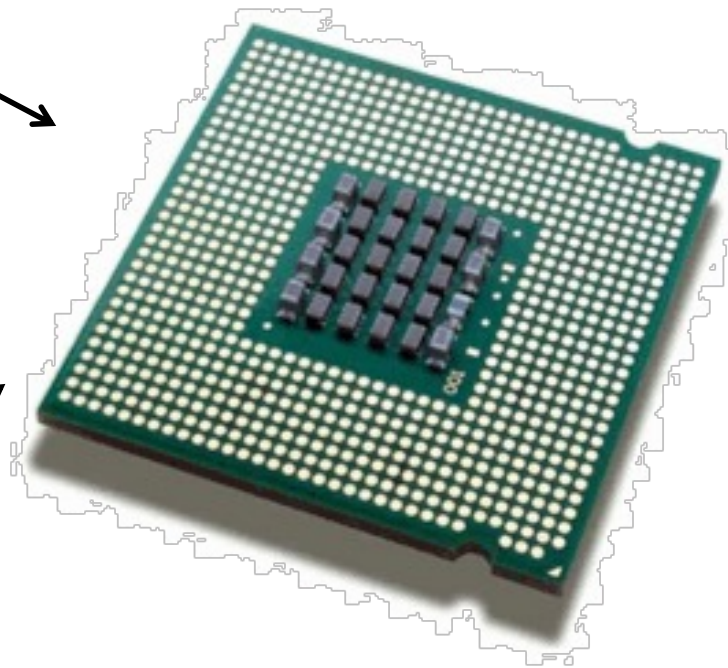
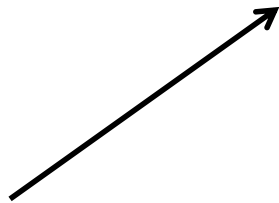
ALU

La CU (Control Unit) è la parte che controlla il trasferimento di dati da una parte all'altra del computer.

print



“ciao”



CU

Da dove vengono i dati elaborati dalla CPU?

3

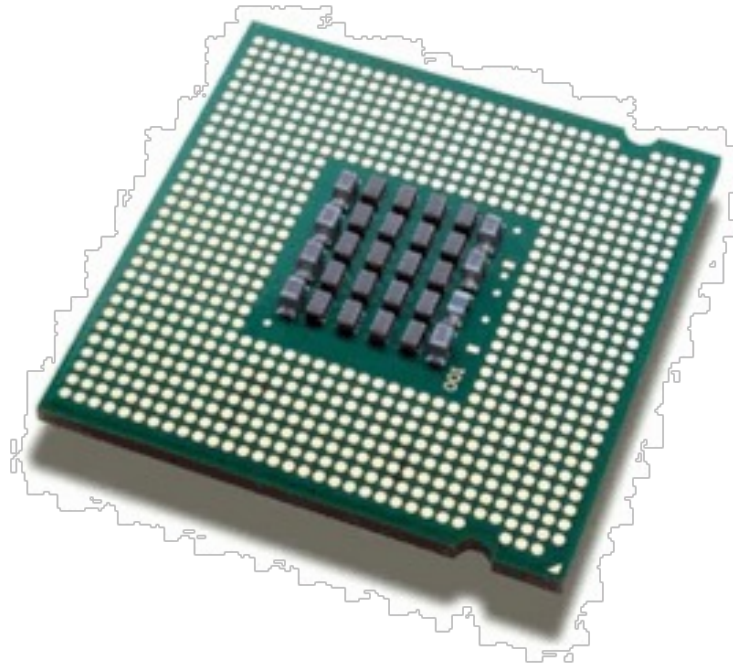
print

+

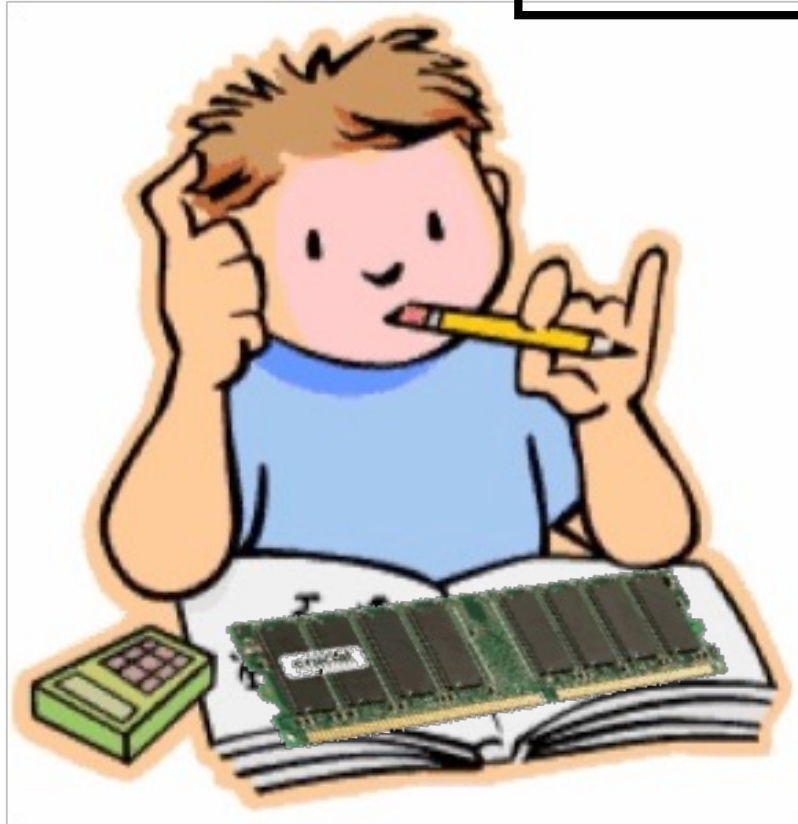
5

“ciao”

?

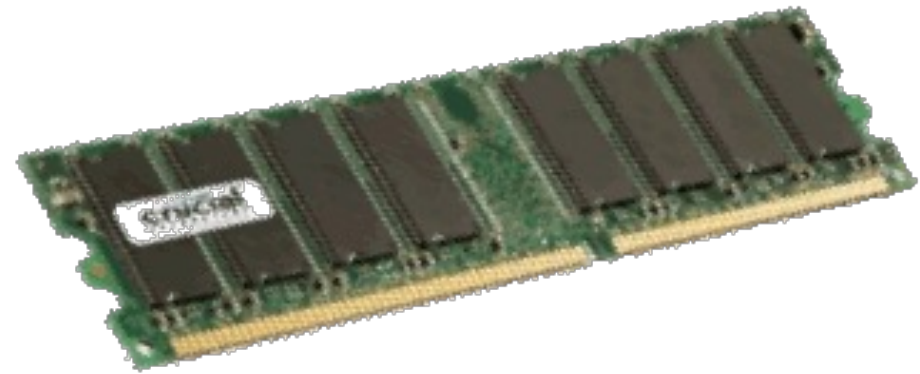
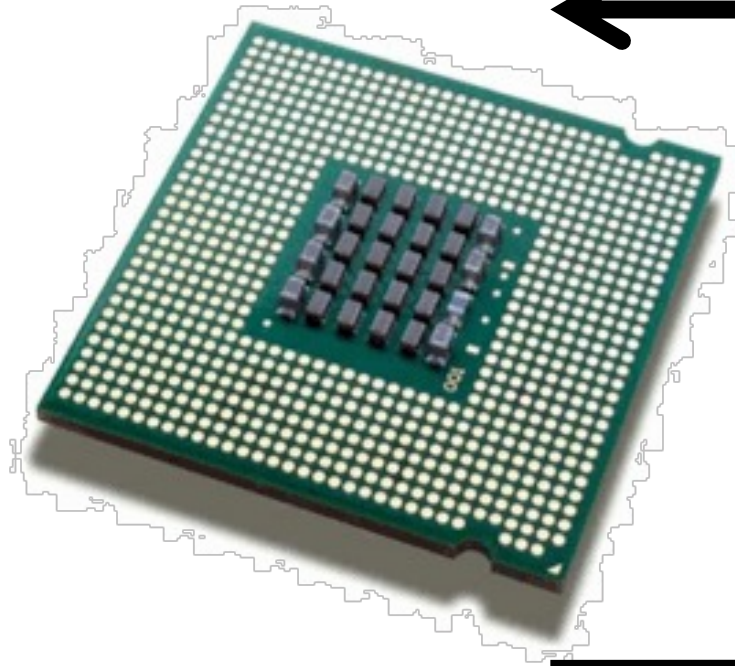


Un altro componente del computer corrisponde al quaderno in cui sono conservati i dati da elaborare, e da cui li preleviamo.
Nel computer il componente si chiama RAM (Random Access Memory).



RAM

operazioni, operandi



risultati

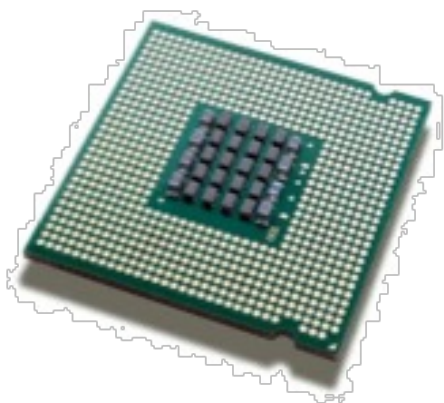


Vediamo come gli altri componenti partecipano alle operazioni del computer.

3

+

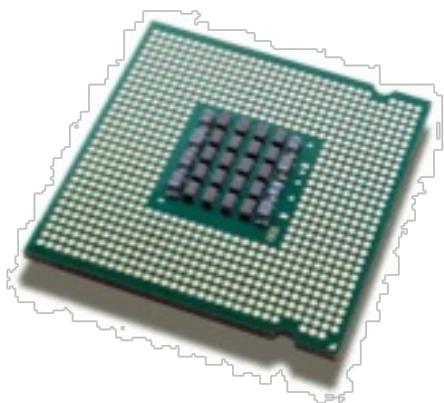
5



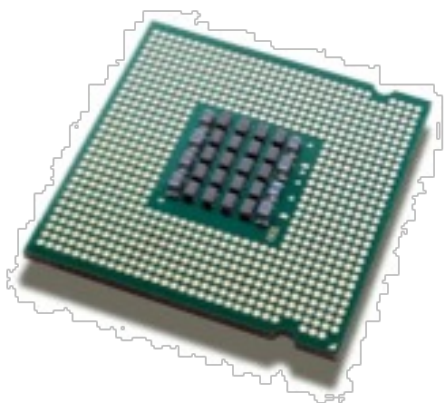
3

+

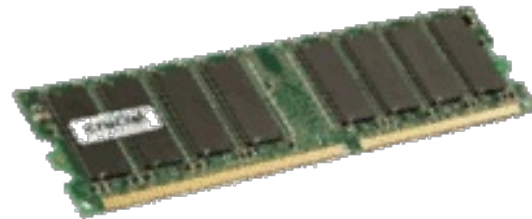
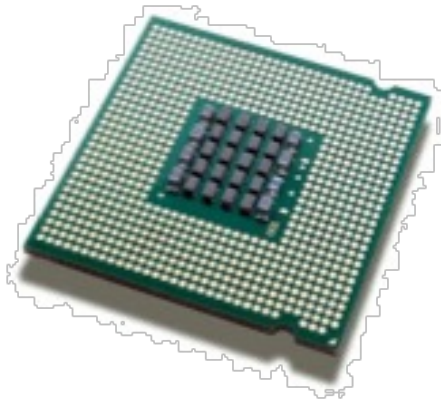
5



8

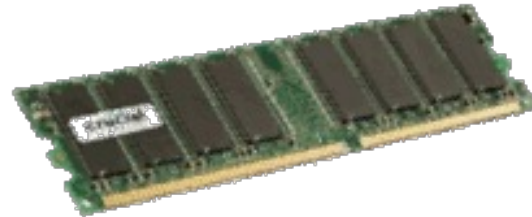
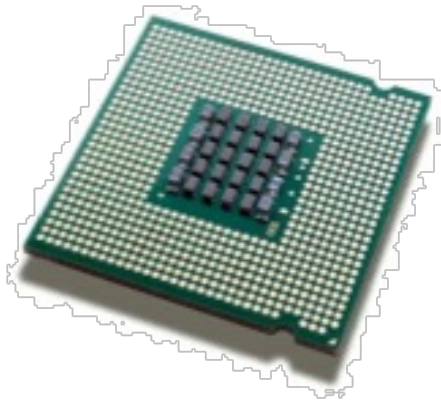


8

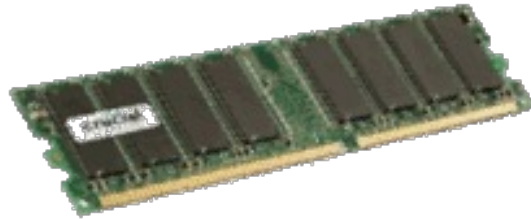
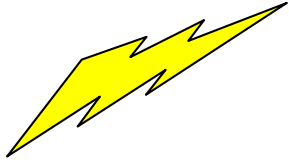
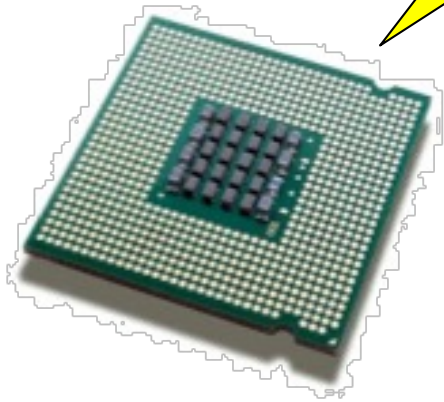


← print

8

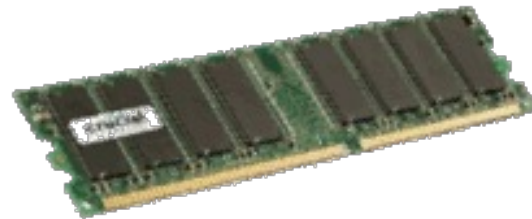
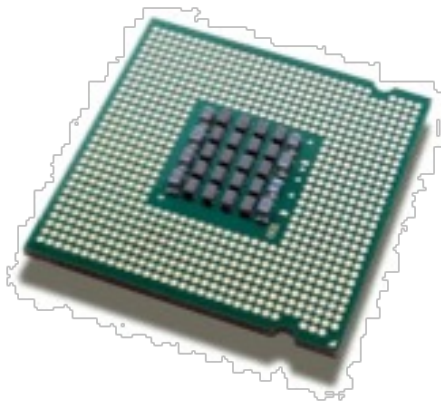


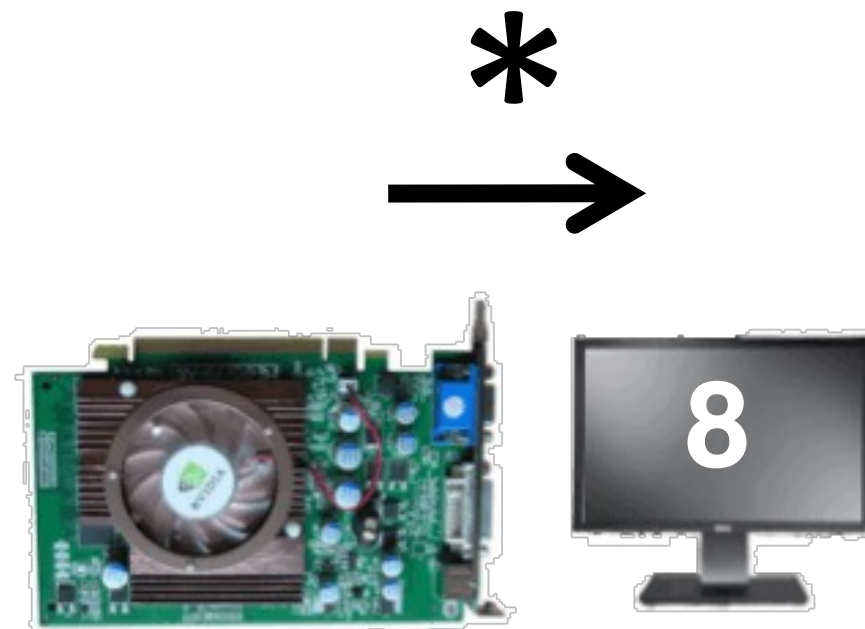
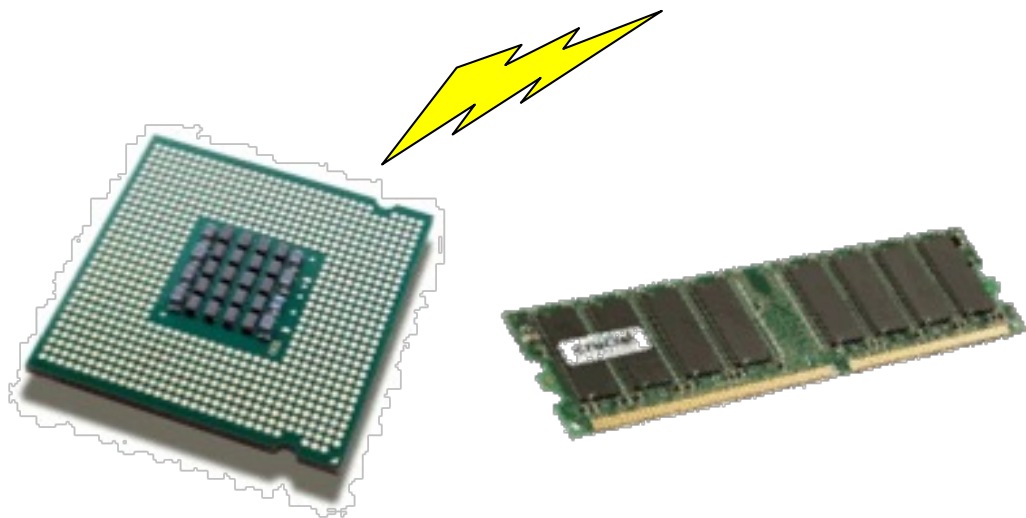
8

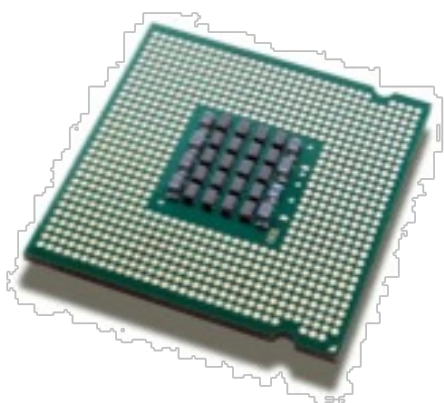


scheda grafica

→ 8







Wii controller
(Nintendo)



PS3 Dual Shock
controller (Sony)



iPhone touch
screen (Apple)



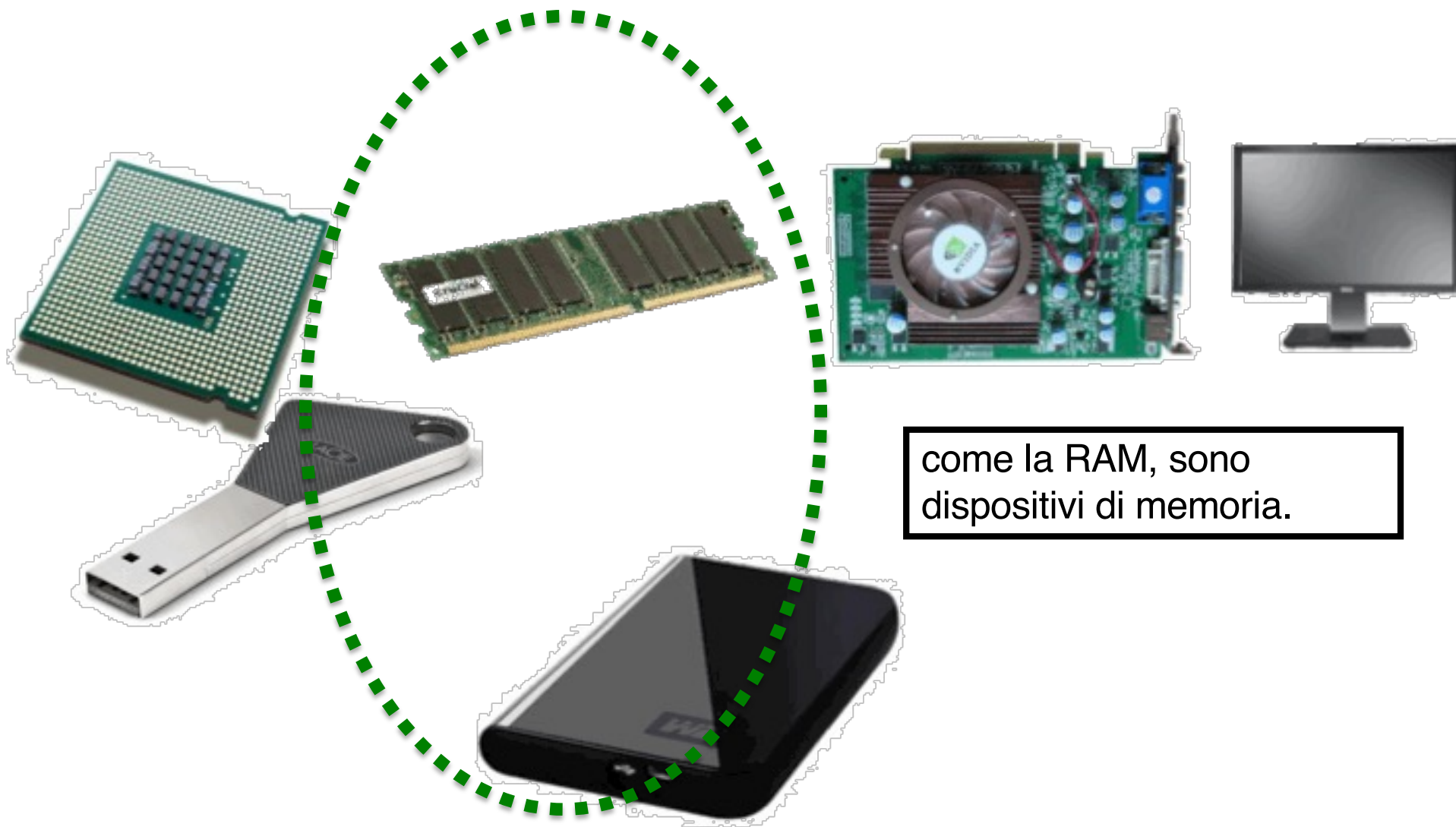
USB stick
(Lacie)

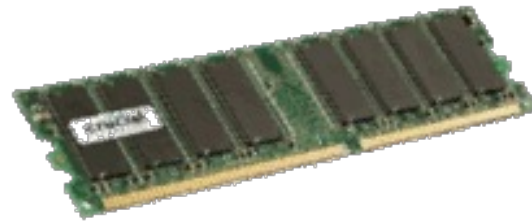
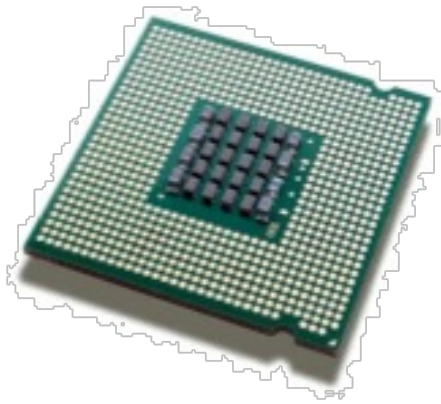


External Hard
Disk (WD)





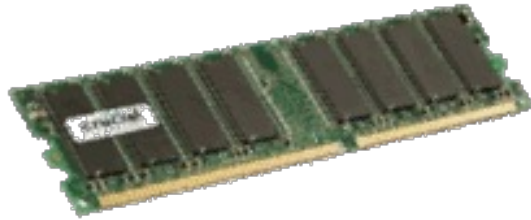




C'è un altro dispositivo di memoria all'interno del computer.

HD

RAM vs HD



Elettronica

Magnetica

Volatile

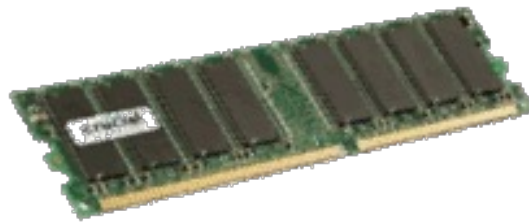
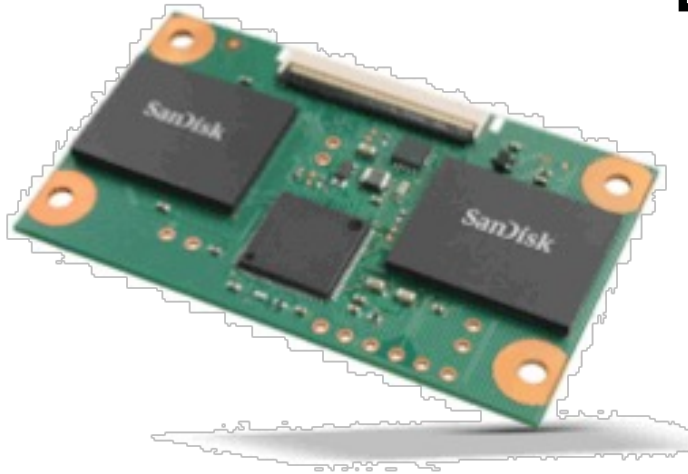
Non volatile

Veloce

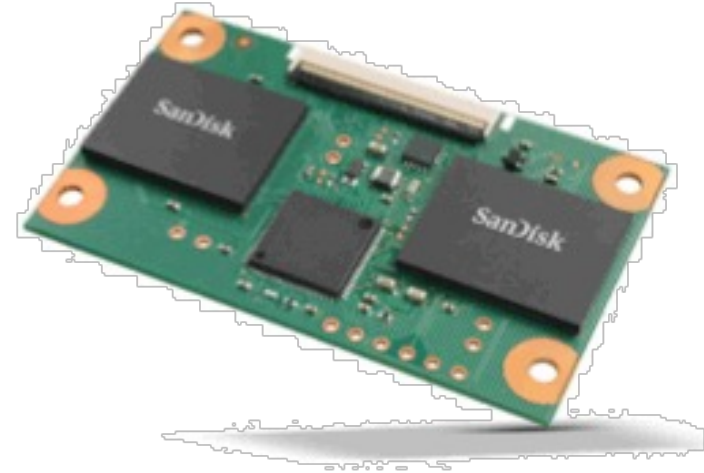
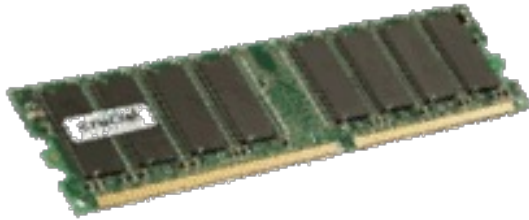
Lenta

Novità tecnologica degli anni recenti.

SSD



RAM vs SSD



Elettronica

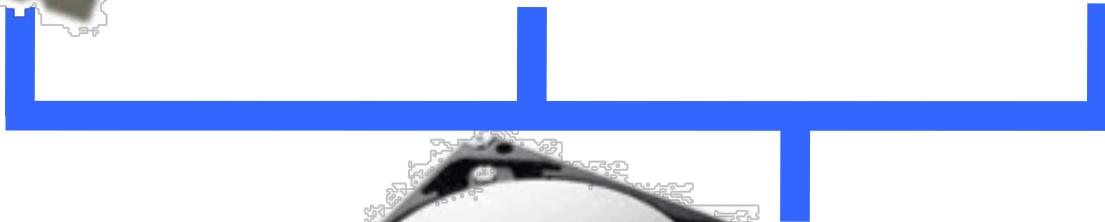
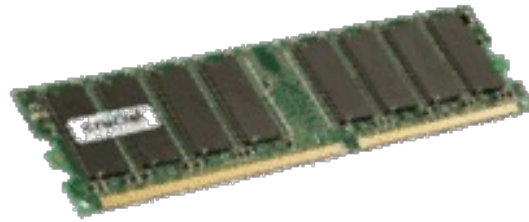
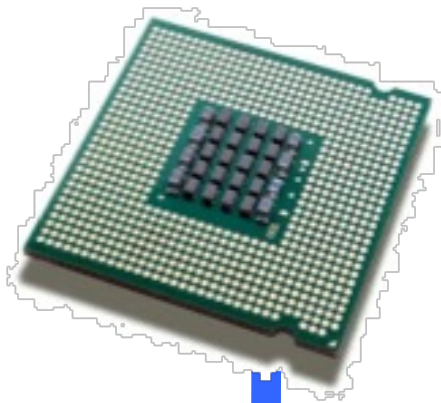
Elettronica

Volatile

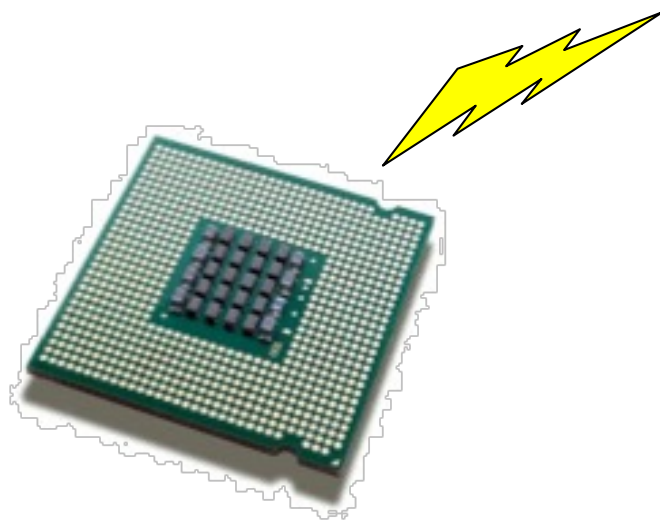
Non volatile

Veloce

Veloce*



Bus



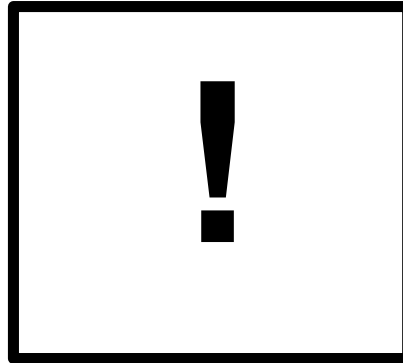
Software





Problema

**Un ostacolo, un impedimento, una
mancanza che vogliamo eliminare.**

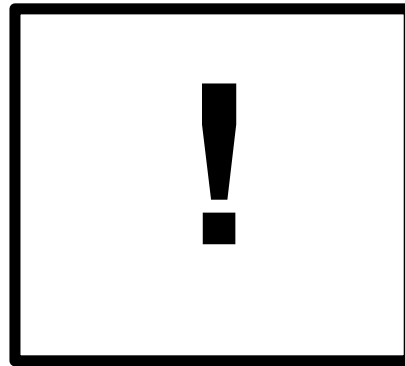
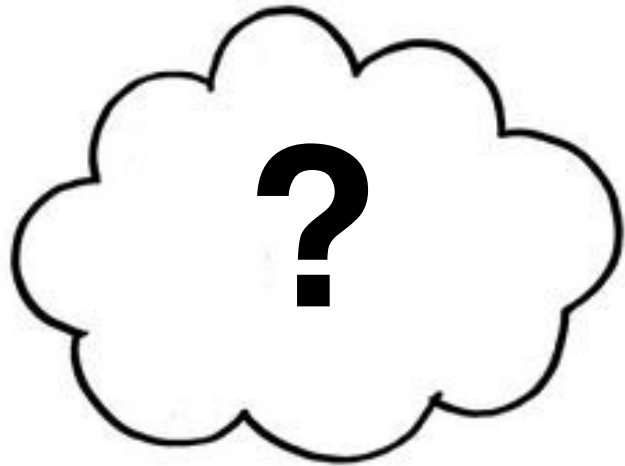


Soluzione

Eliminazione del problema.

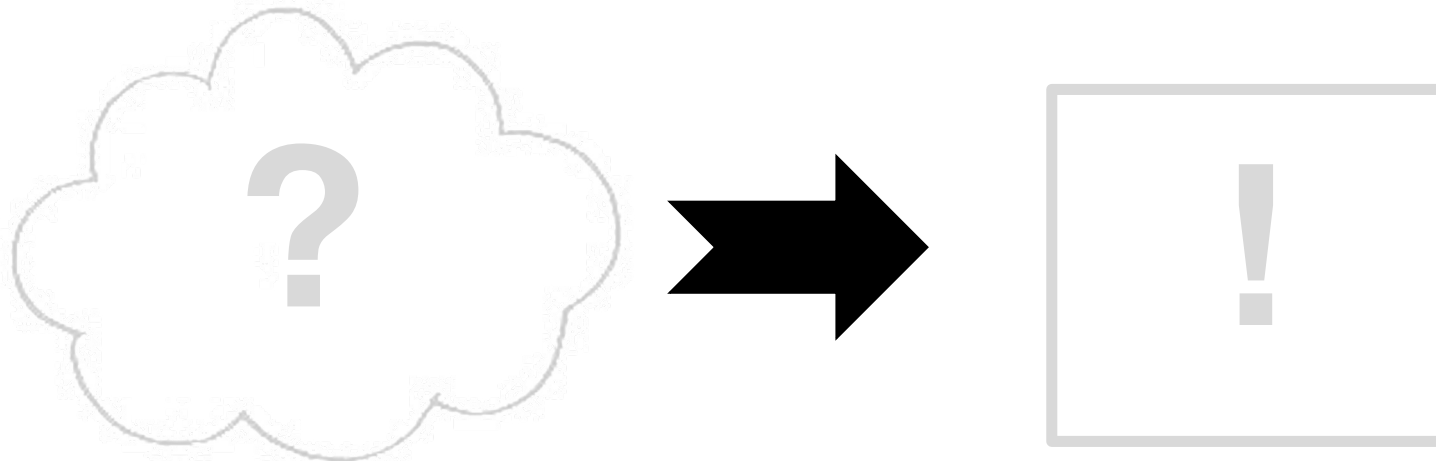


Computer



Un problema si dice risolvibile quando esiste una soluzione per esso.

Se vogliamo che sia il computer a trovare la soluzione, il problema deve essere espresso sotto forma di dati che il computer possa elaborare.



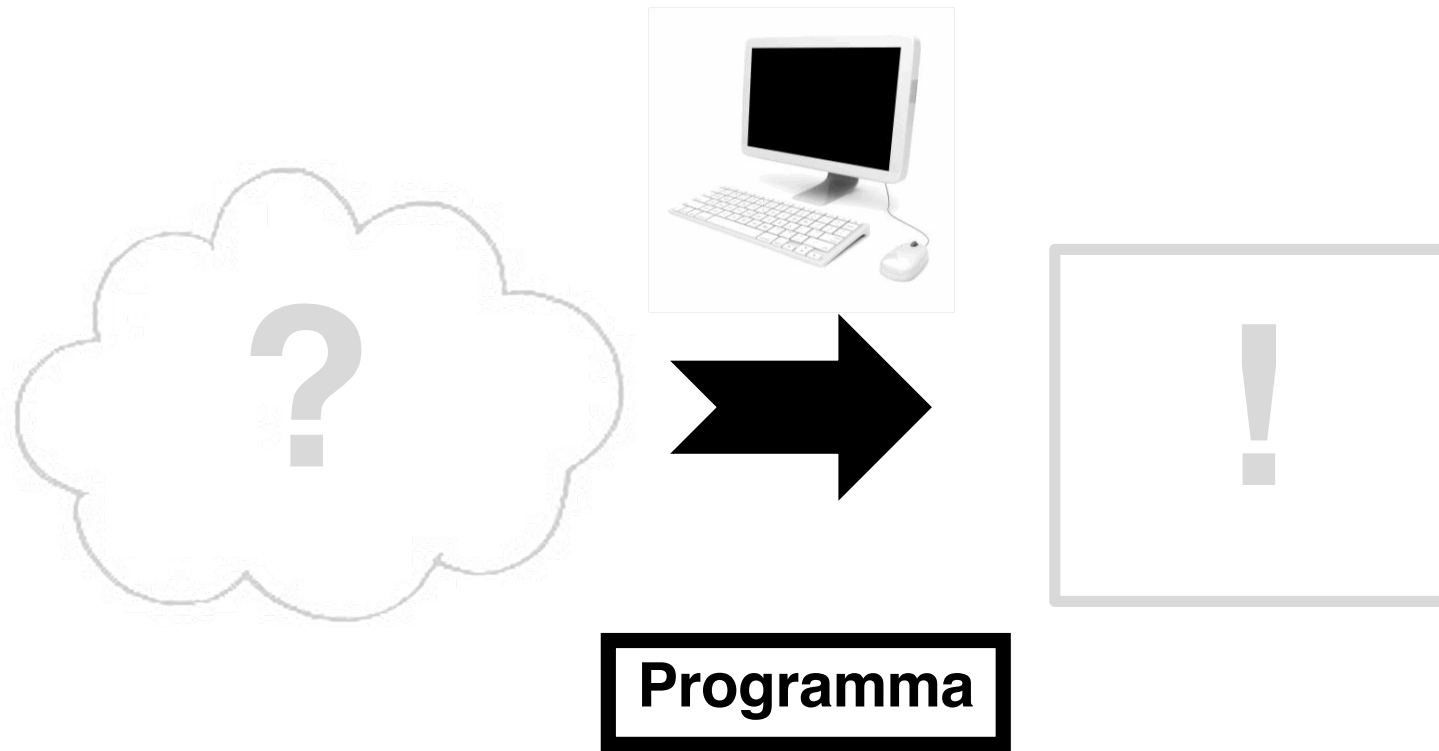
Algoritmo

Un metodo per giungere alla soluzione che presenta le seguenti caratteristiche:

- 1) è una sequenza finita di operazioni ben definite;**
- 2) dopo l'esecuzione di ciascuna operazione, è chiaro quale sia la successiva.**



**Muḥammad ibn Mūsā al-Khwārizmī
(780 – 850)**



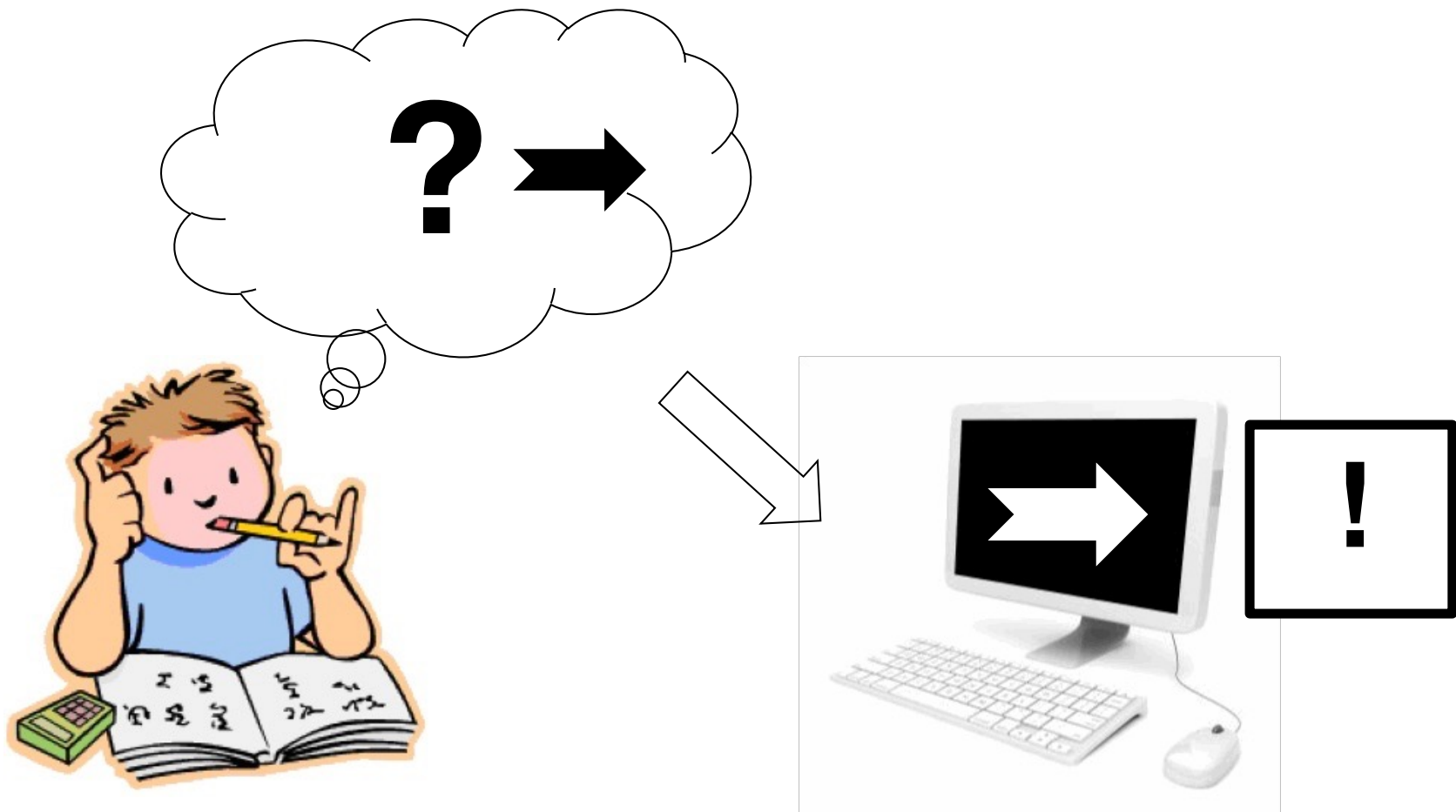
Un algoritmo scritto in modo tale da poter essere eseguito da un computer.

Tutte le operazioni consistono nell'elaborazione di dati numerici.



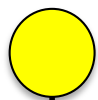
Un programma in esecuzione su un computer.

In linea di massima, i programmi risiedono solitamente sul disco rigido del computer, mentre i processi risiedono nella RAM.

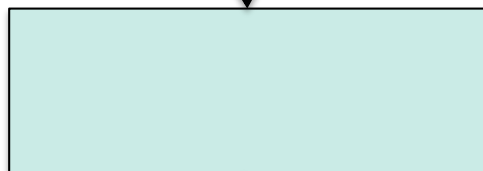


Attenzione: un computer non è in grado di trovare una soluzione autonomamente. L'algoritmo deve prima essere ideato e successivamente trasferito nel computer sotto forma di programma, affinché venga eseguito e fornisca una soluzione.

Diagrammi di flusso

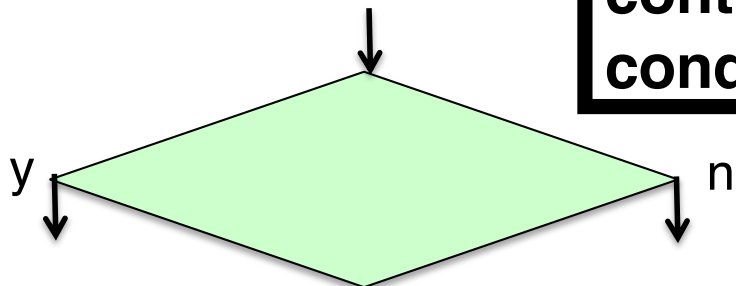


inizio



operazione

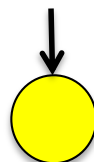
**controllo di
condizione**



y



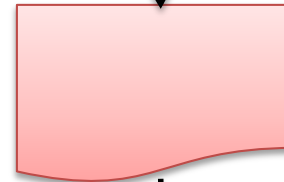
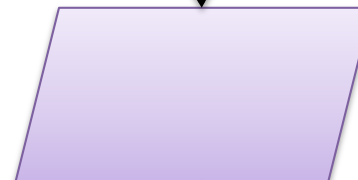
n



fine



input



output

Algoritmo per cuocere la pasta

