

$A \leq_m B$

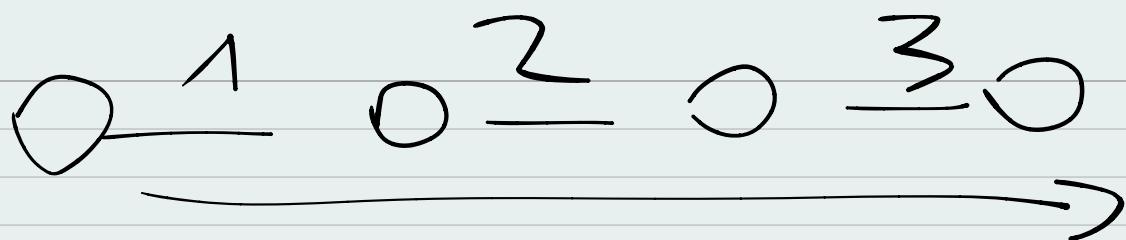
$NP - Horl \leq_m NP - Horl$

$NP \rightarrow \text{verifica } P$

\rightarrow non è nullo
e si è risolvibile

6 \rightarrow FIAZI / RON / AND

NP



$P = \text{SUBLSR}$.

$\text{NP-Hor}' \leq_m \text{UPATH}$
 $\text{GRAD} \leq_m \text{NP-Hor}'$

$A_{\text{TR}} \leq_m \text{NP}$.

PROBL. DIRECTIONS

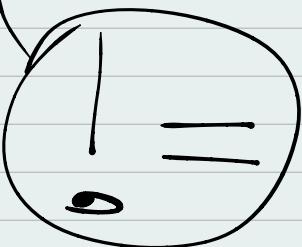
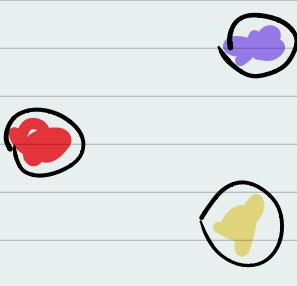
SAT — CIRCUIT
 SAT
 (3-SAT)

$\rightarrow (1 \wedge 2 \wedge 3)$
 DIS
 DISG.
 L > NP

SAT \rightarrow CIRCUIT

3-SAT

3-COLOR \rightarrow



K-COLOR (\leftarrow)

HAM \rightarrow



NP Multi vertex
1 sole vertice

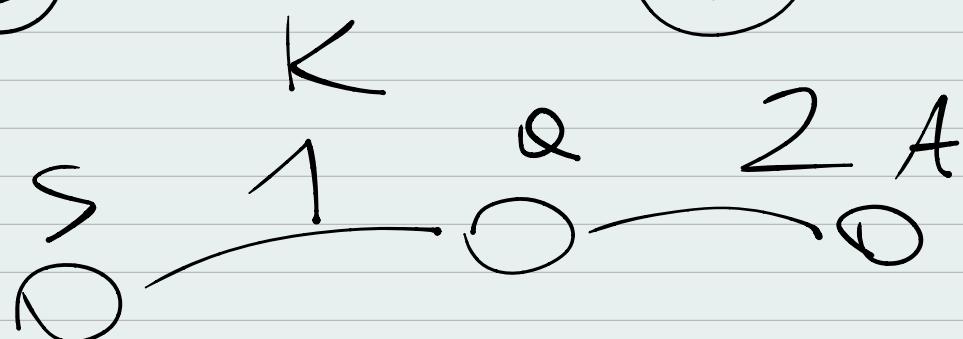
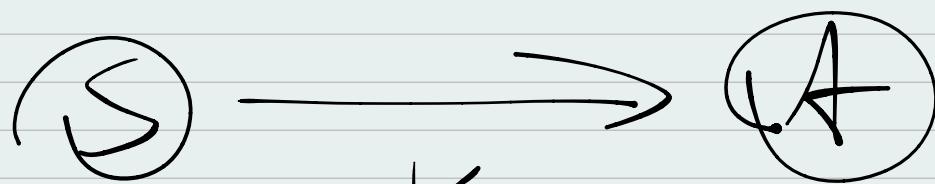
L-PATH = (...)

NP-Complete

\Rightarrow L-PATH \in NP

- LPATH \in NP-Hard

HAN \leq_M LPATH



$$1 + 2 = 3 \Rightarrow K$$

LPATH

① NP

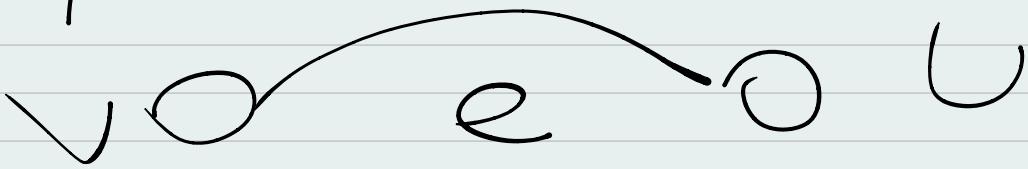
CERTICATO = (G, S, T, K)

- $\exists S (S \in \text{SQ} \cdot \text{DIV})$

\leq length. selgraph

$\leq K$

$(V, U) = \text{VRICI}$



$\rightarrow V(\text{num})$ Common

$\rightarrow \text{ACOSTA}$

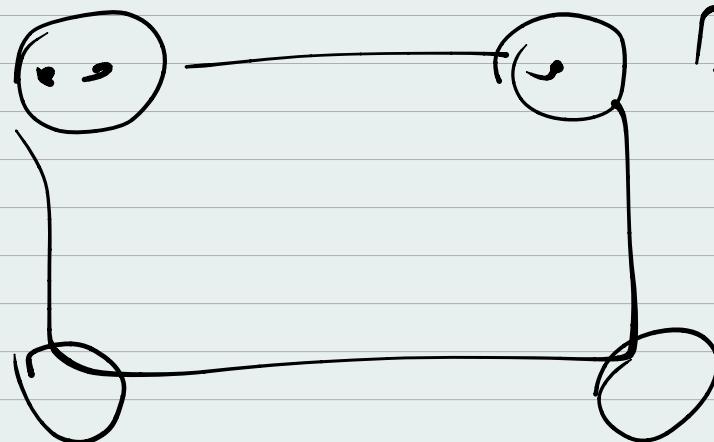
VRICI $\rightarrow NP$

" $O(n)$ $\rightarrow O(V+B)$ "

P

PSSBBS

DSSPVCRA



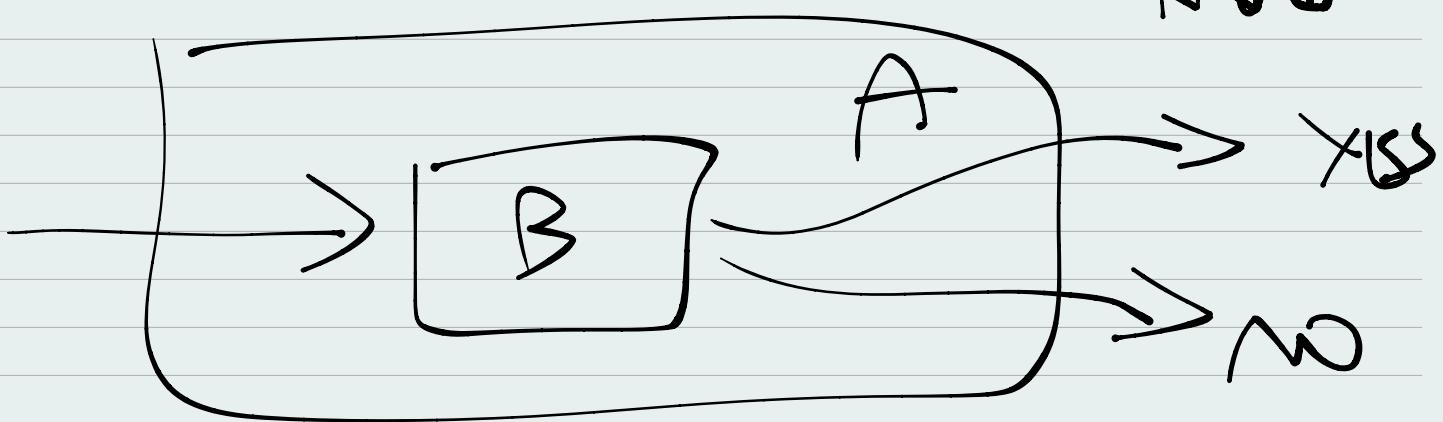
NP - Hard

$A \leq_m B$

↓

$$A_{\text{ind.}} \leq_m B_{\text{ind.}}$$

A B

$$A_{NP\text{-}Horn} \leq_m B_{NP\text{-}Horn'}$$


$$A_{+n} \leq_m LPAFH$$

$$HAM \leq_m LPAFH$$

① $G \in +IAN$

\exists combining P

$S \rightarrow A$

\Rightarrow lunghezza $M = K$

$\langle G \rangle \in \text{ELPAFA}$

(G)

$G \in \text{ELPATH}$

\Rightarrow non ripet. di
voraci

\Rightarrow cammino con $\ell \leq K$

\Rightarrow Hamiltonian

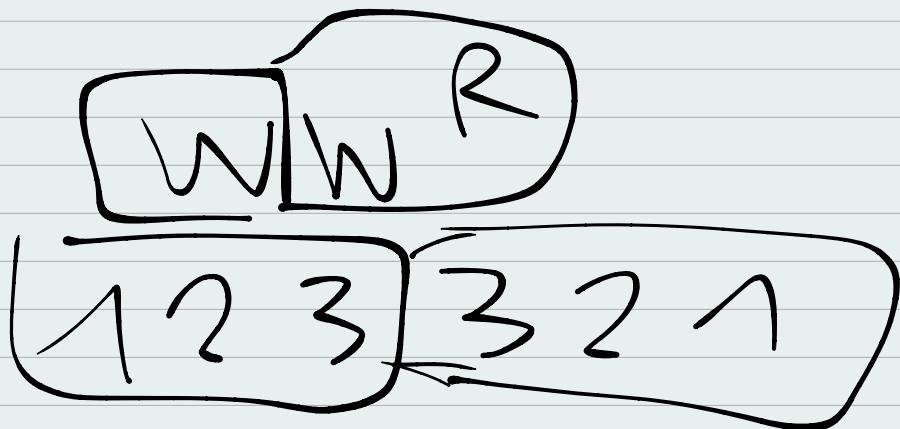
= no voraci
ripetuti

$\langle G \rangle \in \text{HAMILTON}$

\Rightarrow UPATA

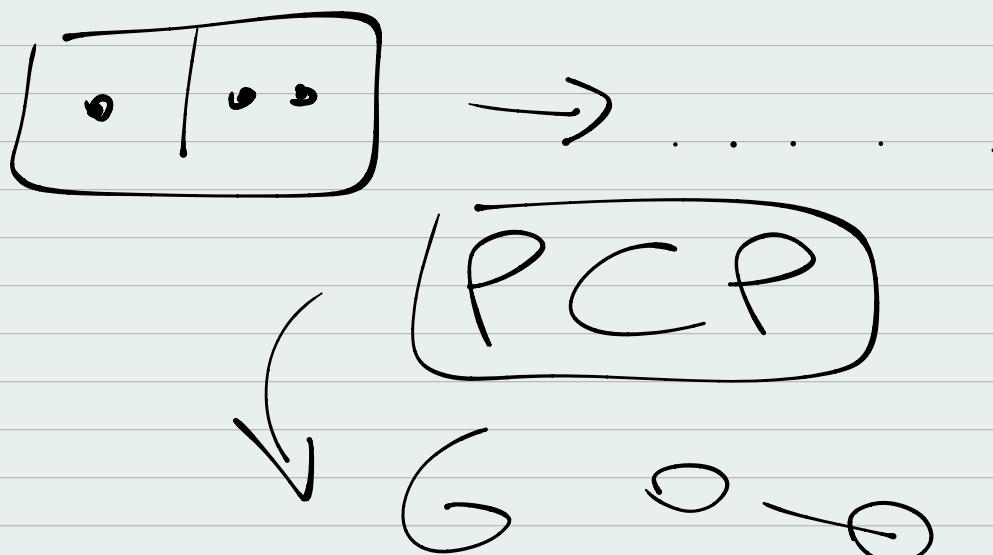
$L_2 = \{ \langle \eta, w \rangle \mid \eta \text{ starts with } \\ \text{length } \leq n \text{ & } w w^R \}$

$A_{\overline{T}\Gamma} \leq_m L_2$



$\boxed{HALT_{\overline{T}\Gamma} \leq_m L_2}$

$F \rightarrow M' \rightarrow M$



$\forall \neq v$
NP-Horn

$HAC(\Gamma_{in}) = \{ \langle M, w \rangle \mid M \in$

una TM e M si ferma

nell' input $w\}$

$[HALT_M \leq ww^R]$

$[F \rightarrow M' \rightarrow M]$

$F \rightarrow$ su input $\langle M, w \rangle$

- $M = TM$ / w = stringa

- M' su input x

simile M su w

Se $w = "123321"$, ~~o catt~~

Se $w \neq \dots \rightarrow$ rifiuto

Ritorno $\langle M' \rangle$

① Se M' accetta w ,
(M' simula M)

M' controlla che
il resto della stringa w^R

$$w = w^R$$

→ accetta

→ otherwise "rifiuta"

① M' simula M

a. M' accetta w
(si ferma)

② M' controlla che
il resto dell'input sia
 w^R

$M' \rightarrow ww^R$ accetta
(rifiuta altrimenti)

③ Rithmone $\langle M' \rangle$

$\langle M, w \rangle \in \text{HALT}_{\text{Turing}} \Rightarrow$
 $M' \in L_2$

$\text{TM}_{\text{SINGOLI}} \leq_m \text{TM}_{\text{HM}}$

www | # | ww | # -

$1^\circ H \uparrow 2^\circ H$

I W w w w | # # # - . .

↑
OUT OF
BOUNDS

• = MARKER

$\delta: Q \times \Gamma^K \rightarrow$

$\delta: Q \times \Gamma^* \rightarrow \{L, R\}^K$

→ TRANSITIONS

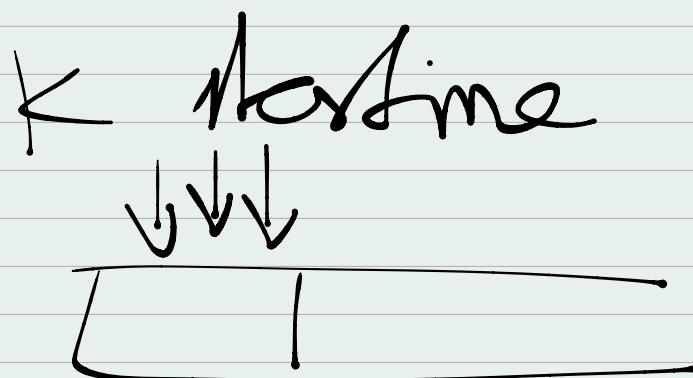
① TRANS. NS

=

② DRWS. MTH

S = See input "w":

① $(q_1, q) = (r, B, L)$



① $\rightarrow 2q$

② $\rightarrow 5q$

③ $\rightarrow 4q$

COMOL SYMBOL

$$\textcircled{1} \quad (q_1, q) = (t_1, B_1, L)$$

\rightarrow OGN' PERSONA

VA A SX

PER IL CAZZO SUO!

E' V PERSONA!
← MARCATORI

Ogni netto che c'è
un moratore, realisse

lo spostam. e SX

(\rightarrow Repliche per netto
le bestine

$$-(q_1, q) = (r_1, B_1, R)$$

\downarrow (SANGAS
LGRS)

- le Singing

Q ACC & T \Rightarrow scatto

(ultimamente rifinito)

$\text{TM}_{\text{SING}} \Rightarrow \text{TM}_{\text{MK}}$

$\text{TM}_{\text{SING}} \leftarrow \text{TM}_{\text{MK}}$

1 PASSAGNA (Boreale)

- $\text{PAL}_{\text{DFA}} = \{ \langle M \rangle \mid M$

è un DFA che accette
palindromo}

① Lavoriamo M decidibile

② $A_{\text{DFA}} \subseteq_m \text{PAL}_{\text{DFA}}$

↓
M è un DFA che su
input w:

- leggi w
- Verifica se w
- Verifica se $\exists w^R$
- accette \rightarrow (ST. RISUS)
- rifiuti altrimenti

DECIDIBILITÀ $\Rightarrow \exists \Pi$

$\boxed{A_{DFA} \leq_R \text{PAL}_{DFA}}$ *che lo spiega*

come conclusione

SST PARTE IRONING

$$\underbrace{\Sigma_1}_{\sim 15} / \underbrace{\Sigma_2}_{\sim 15} = 10$$
$$(2+3) = 5$$

(BIN-PACKING)

DERRIS

→ INCASORO BLOCK/H

$$SP \leq_M RT$$

(NP-Hard)

$$S_1 / S_2$$

$$1 + 2 = 3$$

SP

→ RDING

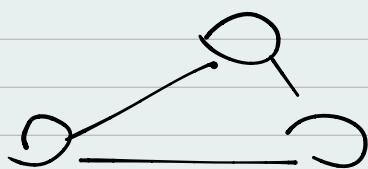
$$\frac{1}{2} + \frac{3}{2} = \frac{4}{2} = 2$$

SPSSCS

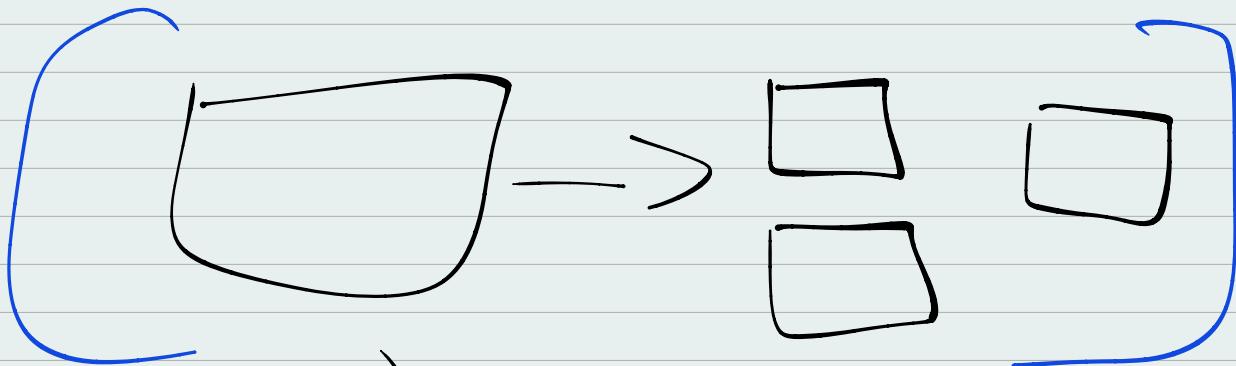


SORTA = 'NCAWU

$$\begin{matrix} (3+1)(2+1) \\ (1+3) \end{matrix}$$



$$1+2>3$$



[Hardcore ^]

Cries inside ...

