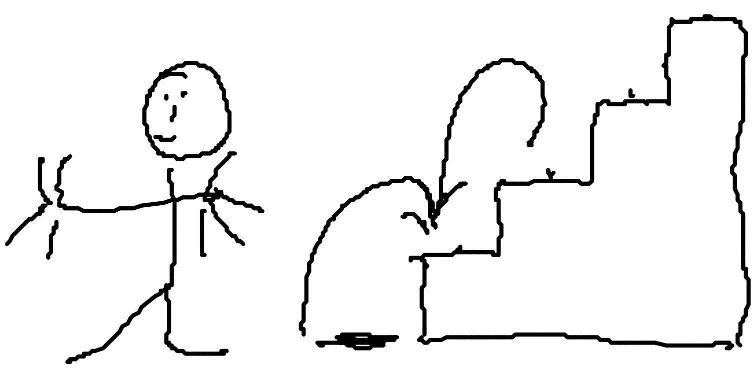
ASF

$\uparrow\downarrow \in L$

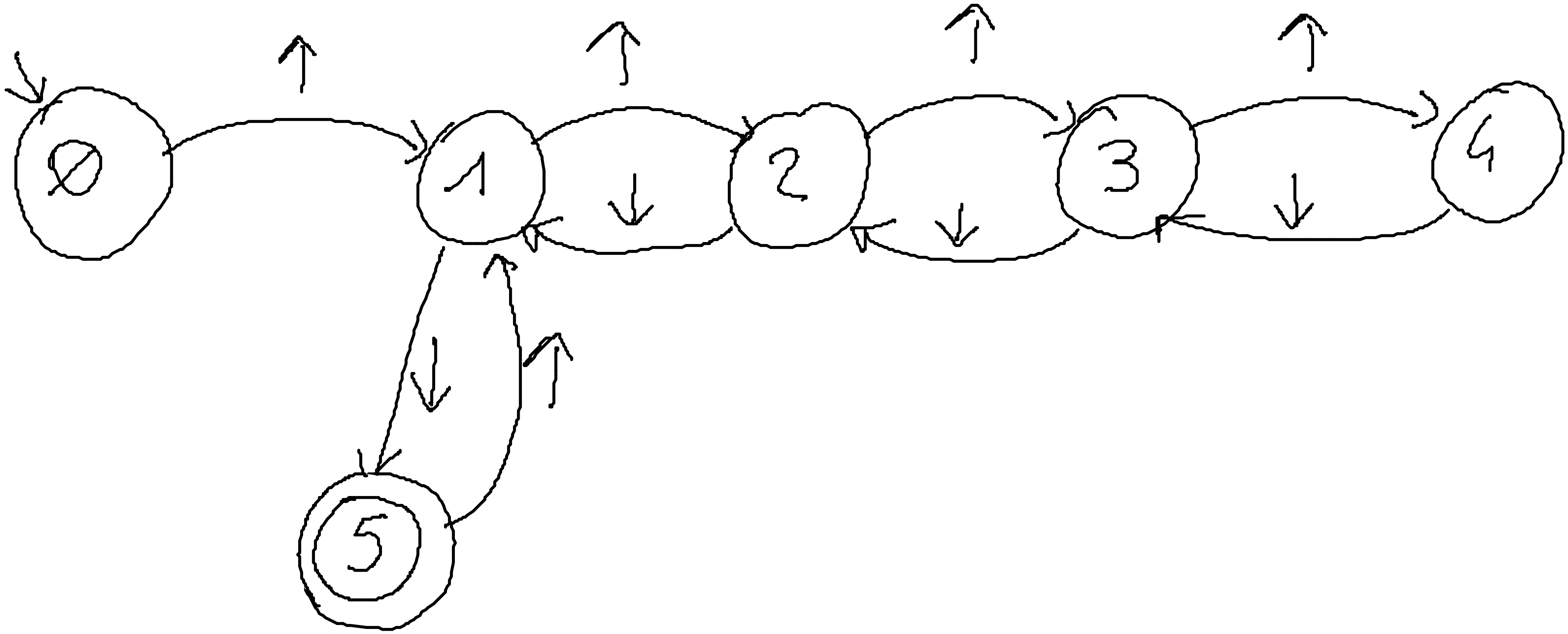
$\uparrow\uparrow\downarrow\uparrow\downarrow\downarrow \in L$

$\uparrow\uparrow\downarrow\downarrow\downarrow \notin L$

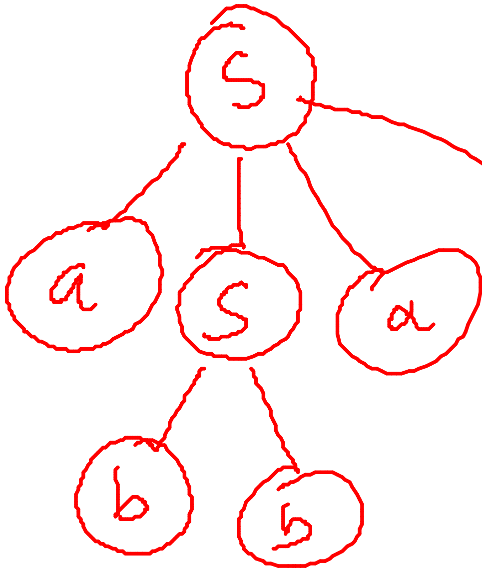
$\uparrow\downarrow\uparrow\downarrow \in L$

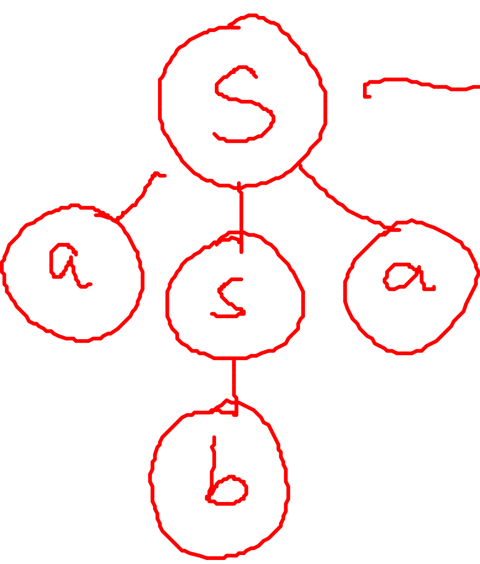


$\Lambda = \{\uparrow, \downarrow\}$



0
1
2
3
4
5
↑
↓





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

s palindroma

abba palindroma
aba //
abaa non //
bab palindroma
a, b //
aa //
bb //

G tale che L_G sia il linguaggio delle stringhe palindrome non vuote su Σ

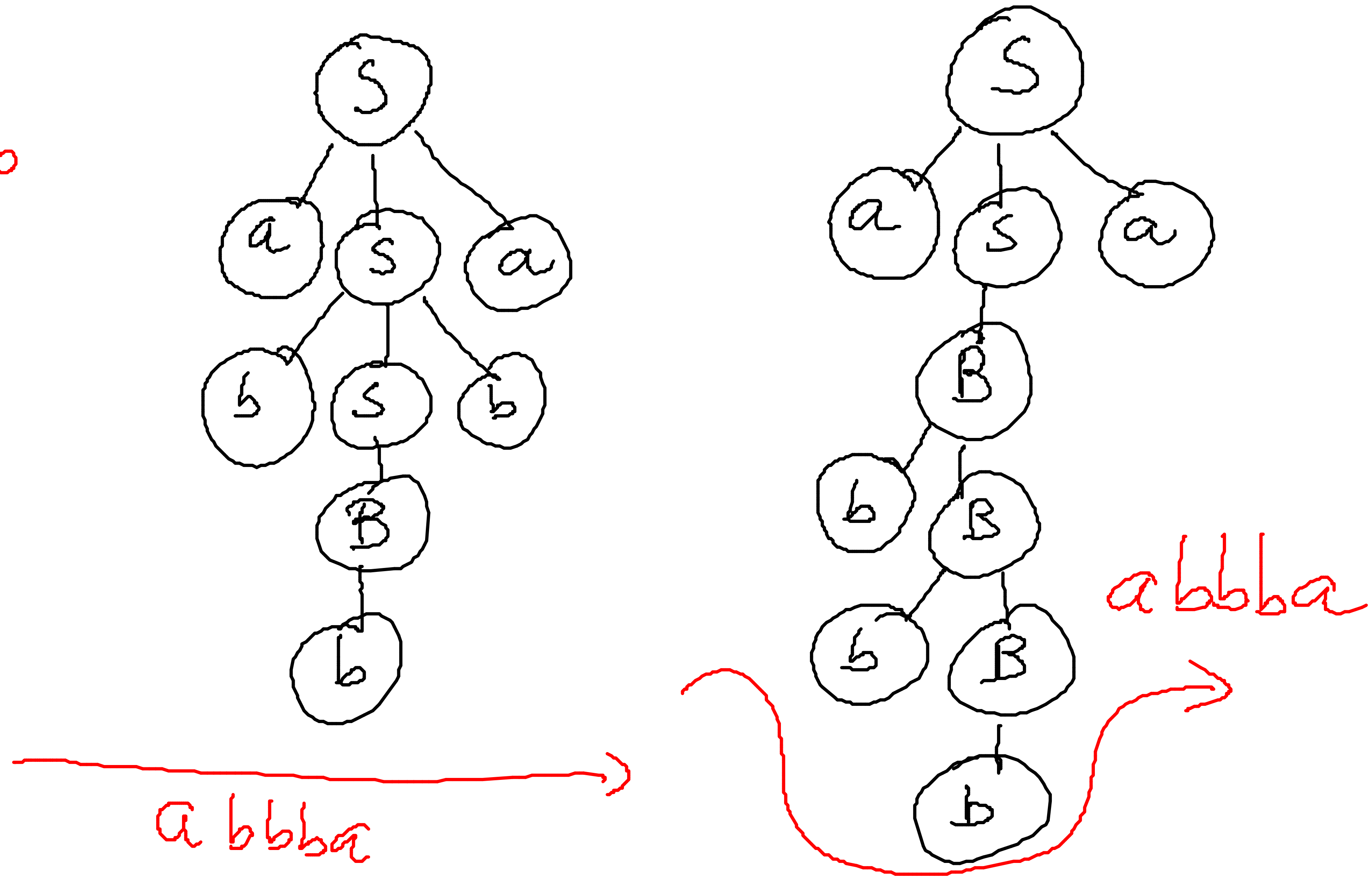
$$S \to a \mid b \mid aa \mid bb \mid aSa \mid bSb$$

$S \rightarrow aSa \mid bSb \mid A \mid B$

$A \rightarrow aA \mid a$

$B \rightarrow bB \mid b$

abbba



$\Lambda = \{a, b, c\}$

$\alpha \in \Lambda^*$ $\quad |\alpha|_{-c}$ α dove tutte le c vengono cancellate

$$|abbcabc|_{-c} = abbab$$

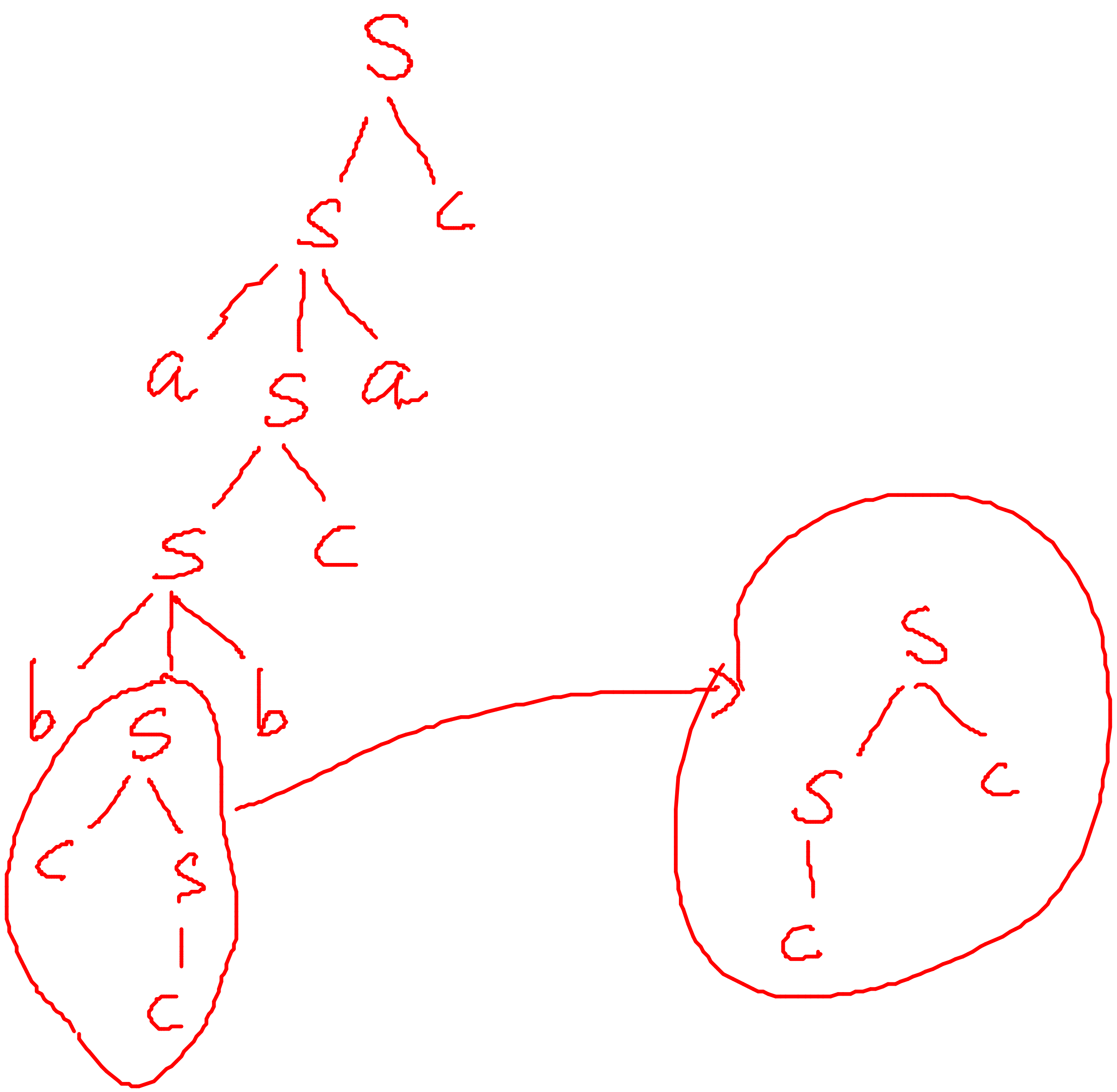
$$L = \{\alpha \mid \alpha \in \Lambda^+ \text{ e } |\alpha|_{-c} \text{ è palindroma}\}$$

$abccbca \in L$ $\qquad ccc \in L$

$abacccbc \notin L$

$S \to a \mid b \mid aa \mid bb \mid aSa \mid bSb \mid cS \mid Sc \mid c$

$\underbrace{abccbc}ac$

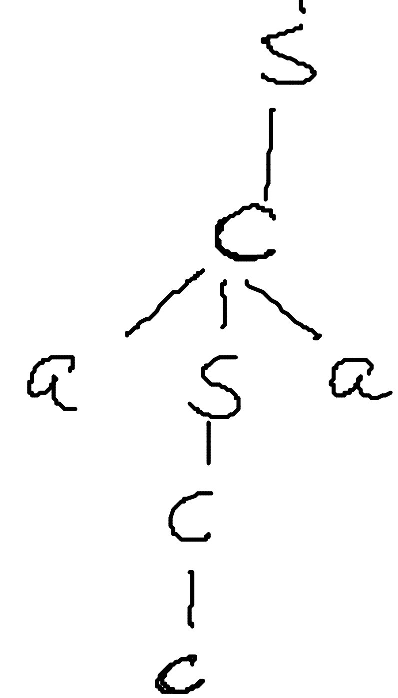


$S \to a \mid b \mid aa \mid bb \mid C$

$C \to c \mid aSa \mid bSb$

NO!

acbba



$S \to \varepsilon$ sì!

$S \to CaC \mid CbC \mid CaCaC \mid CbCbC \mid$
$CaCSCaC \mid CbCSCbC \mid cC$

$C \to \varepsilon \mid c \mid cC$

$S \to aSa \mid bSb \mid A \mid B \mid c \mid cS \mid Sc$
$A \to aA \mid a$
$B \to bB \mid b$

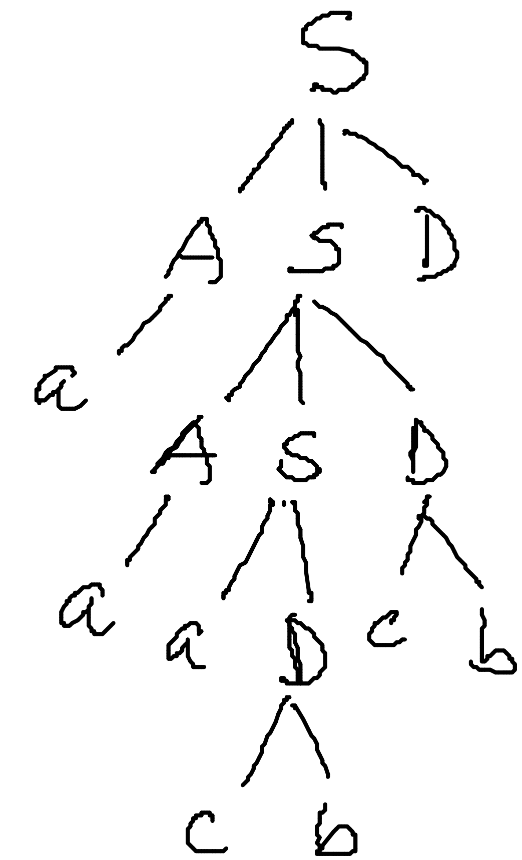
$L = \{ a^k c^m b^m \mid k, m > 0 \}$

$S \to AD \mid \cancel{ASD}$

$A \to a \mid aA$

$D \to cb \mid cDb$ ~~NO!~~

S||



$aaacbcb \notin L$

Dimostrare che $L = \{ a^k c^n b^n \mid n, k > 0 \}$ non è regolare. (pumping lemma)

Se L è regolare allora

$\exists n$ tale che tutte le stringhe w

$|w| \geq n$ possono essere divise in tre

parti $w = xyz$ con le proprietà

- $y \neq \varepsilon$
- $|xy| \leq n$
- $xy^iz \in L$ per ogni $i \in \mathbb{N}$

L reg $\Rightarrow$ valgono le proprietà

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$$A \Rightarrow B \equiv \neg B \Rightarrow \neg A$$

Qualunque sia n io trovo una stringa più lunga di n tale le 3 proprietà non valgono contemporaneamente qualunque sia k

$a_1 \ldots a_{k-n} \, c_1 \ldots c_n \, b_1 \ldots b_n$

$a^{k-n} c^n b^n$

- $y \neq \varepsilon$ $\quad v \neq \varepsilon$
- $|xy| \leq n$ $\quad |uv| \leq n$

$|a \, c^{n/2} b^{n/2}| \geq n$

$x = \varepsilon \quad y = a$

$y = a \, c \ldots c$

$y = a \, c^{n/2} \, b \ldots b$

$x = a$

$y = c \ldots c$

$y = c^{n/2} \, b \ldots b$

K

$|a c^k| b^k$ $\leq k$

xyz $\quad$ $|xy| \leq k$

$b \cdot \cdot b$