$G: \quad S \to aS \mid b$

$= \{ b, ab, \underline{aab}, aaab, \dots \}$

$L = \{ a^{(n)} b \mid n \geq 0 \}$

$X^0 = \varepsilon$

$X^1 = X$

$X^2 = XX$

$\vdots$

$X^n = \underbrace{X \dots X}_{n \text{ volte}}$

$\underline{S \to AB} \qquad A \to aAbb \mid abb$

$B \to bBc \mid bc$

(A) abb

$aabbbb$

aaabbbbbb

$$L(A) = \{ a^n b^{2n} \mid n > 0 \}$$

(B) bc
bbcc
bbbccc

$$L(B) = \{ b^m c^m \mid m > 0 \}$$

S → A B

aAbb · bBc = abbbc

aabbbb bbcc = aabbbbbbcc

abb bBc

abb · bbcc = abbbbcc

$a^n b^{2n} \cdot b^m c^m = \{ a^n b^{2n+m} c^m \mid n > 0, m > 0 \}$

$L(G) = \{ a^n b^s c^m \mid n, m > 0 \}$

$L = \{$ $\quad$ $\}$

$J = 2n + m$

$a^n b^{2n} \quad b^m c^m$

$\downarrow \qquad \downarrow$

$A \qquad B$

$S \to AB$

$S \to A \times B$

$A \to aAb \mid ab \qquad A : \{ a^n b^n \mid n > 0 \}$

$X \to bX \mid b \qquad X : \{ b^m \mid m > 0 \}$

$B \to bBa \mid ba \qquad B : \{ b^J a^J \mid J > 0 \}$

$A \cdot X \cdot B = a^n b^n \cdot b^m \cdot b^J a^J$

$= a^n b^{n+m+J} a^J$

$L(G) = \{ a^n b^{n+J+m} a^J \mid \begin{matrix} n > 0 \\ m > 0 \\ J > 0 \end{matrix} \}$

$\{ a^n b^k a^J \mid n > 0$

$\{ a^n b^j a^k \mid$ $j > 0$

$K > n + J$ $\}$

$K \geq 3$

$$L = \{ a^u \mid u = 2k,\ k \geq 1 \}$$

$$= \{ a^{2k} \mid k \geq 1 \} = \{ a^{2k} \mid k > 0 \}$$

$$= \{ \underset{2}{aa},\ \underset{4}{aaaa},\ \underset{6}{aaaaaa},\ \underset{8}{\cdots},\ \underset{10}{\cdots} \}$$

$\min \#(a) = 2$

$\#(a) = 2k$

vincoli

ricorsione

$S \to aa \mid \dfrac{aaS}{aSa \mid Saa}$

passo base

$$L = \{ a^n b^{2n} \mid n \geq 0 \}$$

$n = 1$

$n = 2$

$n = 3$

$$= \{ abb,\ aabbbb,\ aaabbbbbb,\ \cdots \}$$

Vincolo: per ogni $\underline{a}$, ci sono esattamente

due $\underline{b}$ 1 $a : K\ b$

$S \to abb \mid aSbb$

$S \to \lambda \mid aSbb$

$aS\underbrace{b \dots b}_{k \text{ volte}}$

$a\underbrace{b \dots b}_{k \text{ volte}}$

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

$$= \{ abbbc,\ \underline{aabbbbbc},\ abbbbbc \dots$$

$$= \{ a^{n} b^{n+m+r} c^{m} \mid \begin{matrix} n>0 \\ m>0 \\ r>0 \end{matrix} \}$$

$$= \{ a^{n} b^{n+r+m} c^{m} \mid \begin{matrix} n>0 \\ m>0 \\ r>0 \end{matrix} \}$$

$n>0$ $r>0$ $m>0$

$$\to a^{n} b^{n} \cdot b^{r} \cdot b^{m} c^{m}$$

A B C

$S \to ABC$

$A \rightarrow ab \mid aAb$

$B \rightarrow b \mid bB$

$C \rightarrow bc \mid bCc$