_ _ ( ) __

aab done.

$\boxed{aaa}$
abb
bbb

x

prefix scan.
maintain $f(x) = 2\#b(x) - \#a(x)$

$f(0) = 0$. b a
$f(1) = +2 \quad -1$

$f(x)$ says (is condition satisfied for prefix)

b
ab
aab

$f(x)$ each step is $+2$ or -1.
and for total string $f(\ell) \geq 0$.

$-1 \quad -1 \quad +2 \quad -1 \quad -1 \quad -1$

$\underbrace{\qquad\qquad\qquad}_{\geq 0}$

$+3$

$\geq +2$

if last +2, done.

b
$\underbrace{\qquad\qquad}_{\geq 0}^{+1}$) $+2 \quad -1$)
b a

done.

$\underbrace{\qquad\qquad}$ $+2$) $-1 \cdots -1 \quad -1 \quad -1$

have to get a b somewhere

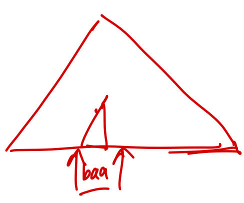
$\boxed{b}$ (

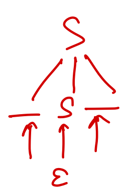
$\geq +2$

b) a . . . a a a

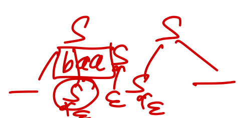
\- - - - $\boxed{b\ a\ a}$ . . . a a
remove this, w/ condition still satisfied ← produce remaining string.

consider leftmost production of word





only non-terminal is S.



Hence, proved.

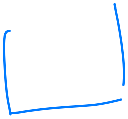
Production : $S \rightarrow bS \mid Sb$

two a , b

one a , one b

GNF .

only leading S is issue.

PDA . 

encounter a ← add (−) symbol (or) remove (+) symbol

b ← add two (+) , or remove two (−)

(or remove (−) , add (+)