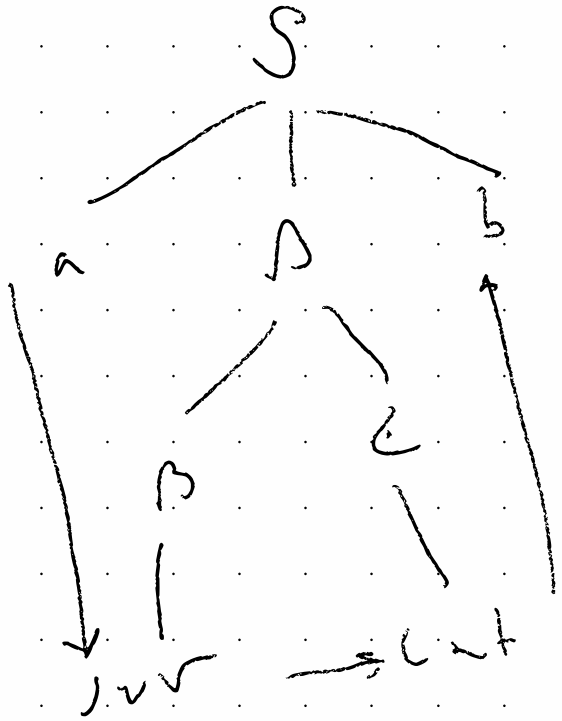
Why is $\{a^i b^i c^i \mid i > 0\}$

not CFL

$\Downarrow$

state $\left[\{ q \in Q, i \in \Omega_0, \; S = \langle s_1, s_2, s_3, \ldots \rangle \right.$

$\left. h \geq 0, \; s_i \in \Gamma \right]$

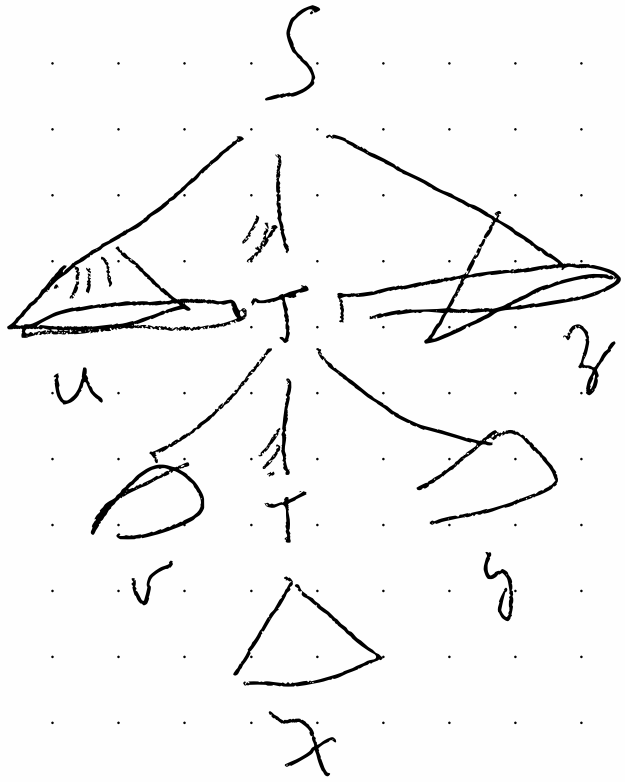


parse tree

S → aAb

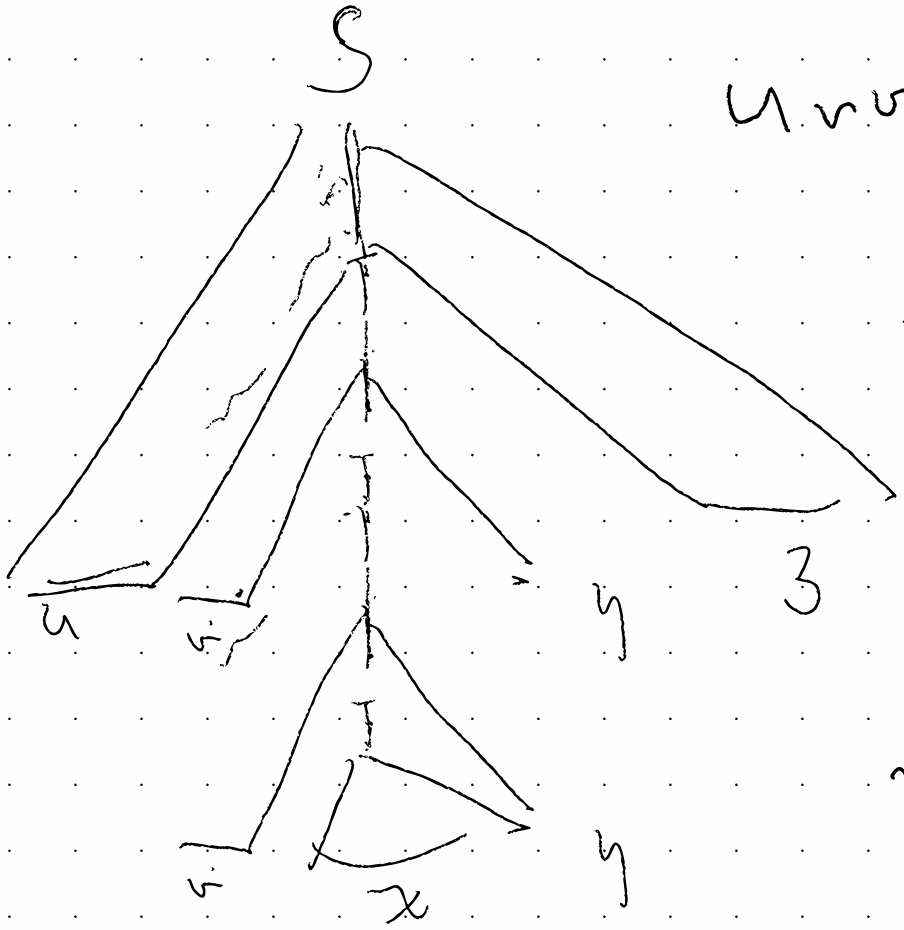
T
neighbor path
T'

any long
enough str



$u \in \Sigma^*$

$S \Rightarrow uvxyz$ derivation

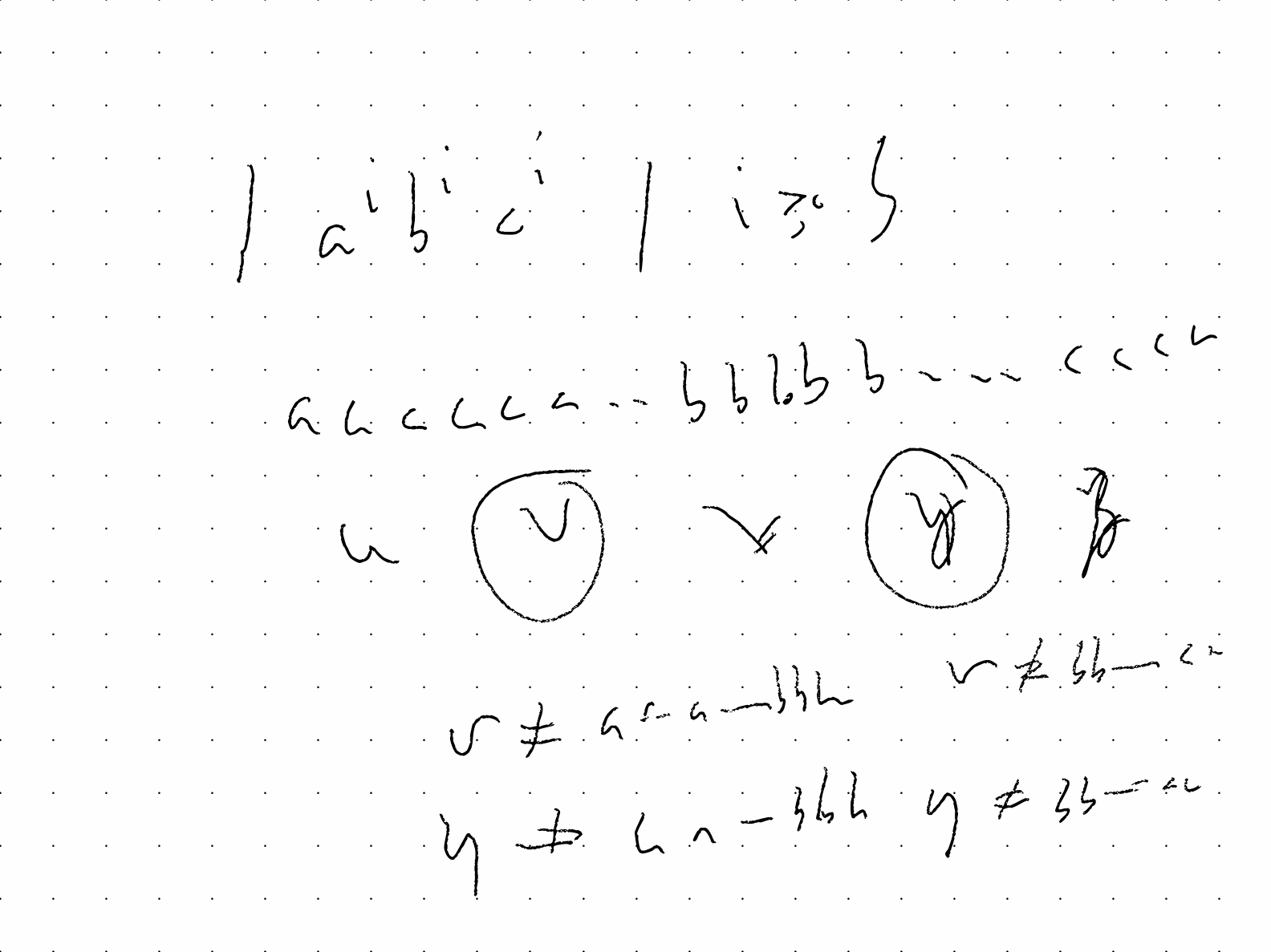


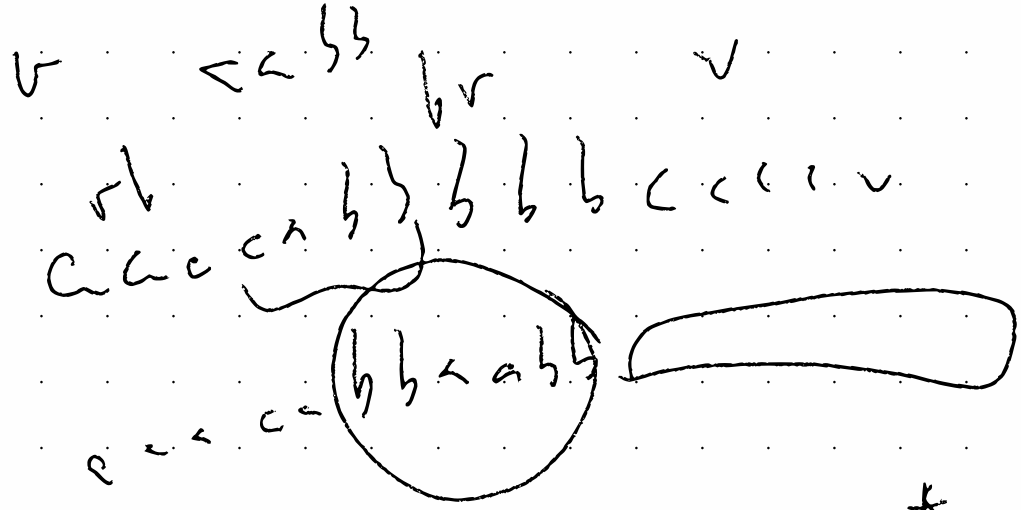
$u v v x y y 3 \in L$

$u v^i x y^i 3 \in L$

$i \geq 0$

$v x 3 \in L$





acc llhhlll — — —

$u v^i x y^i \mid z$

$\exists$ $s \in L$ sufficiently long

$uvxyz = s$ st $\forall i$

$u v^i x y^i z \in L$

$a, b, c \in \{ G, S, Q \}^*$

s.t. $\|a\| = \|b\| = \|c\|$

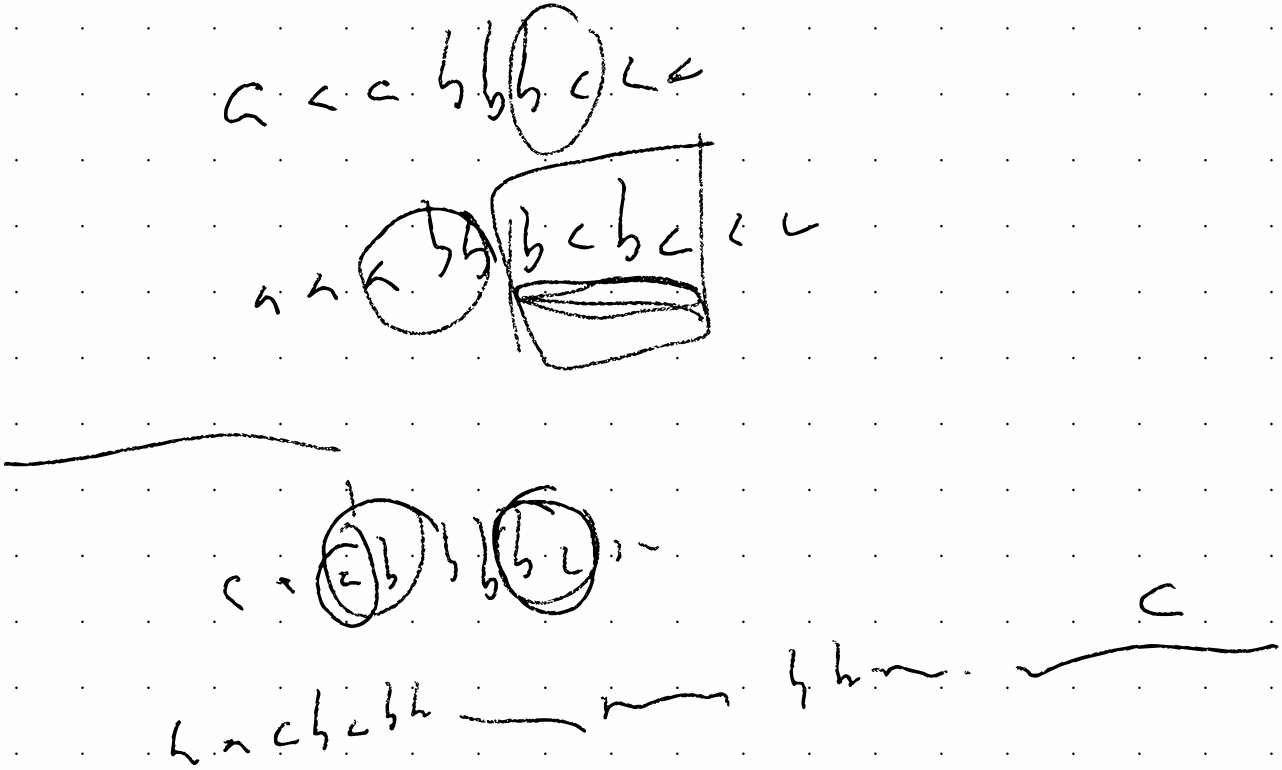
$\forall s \in 2$ - - - pump goal

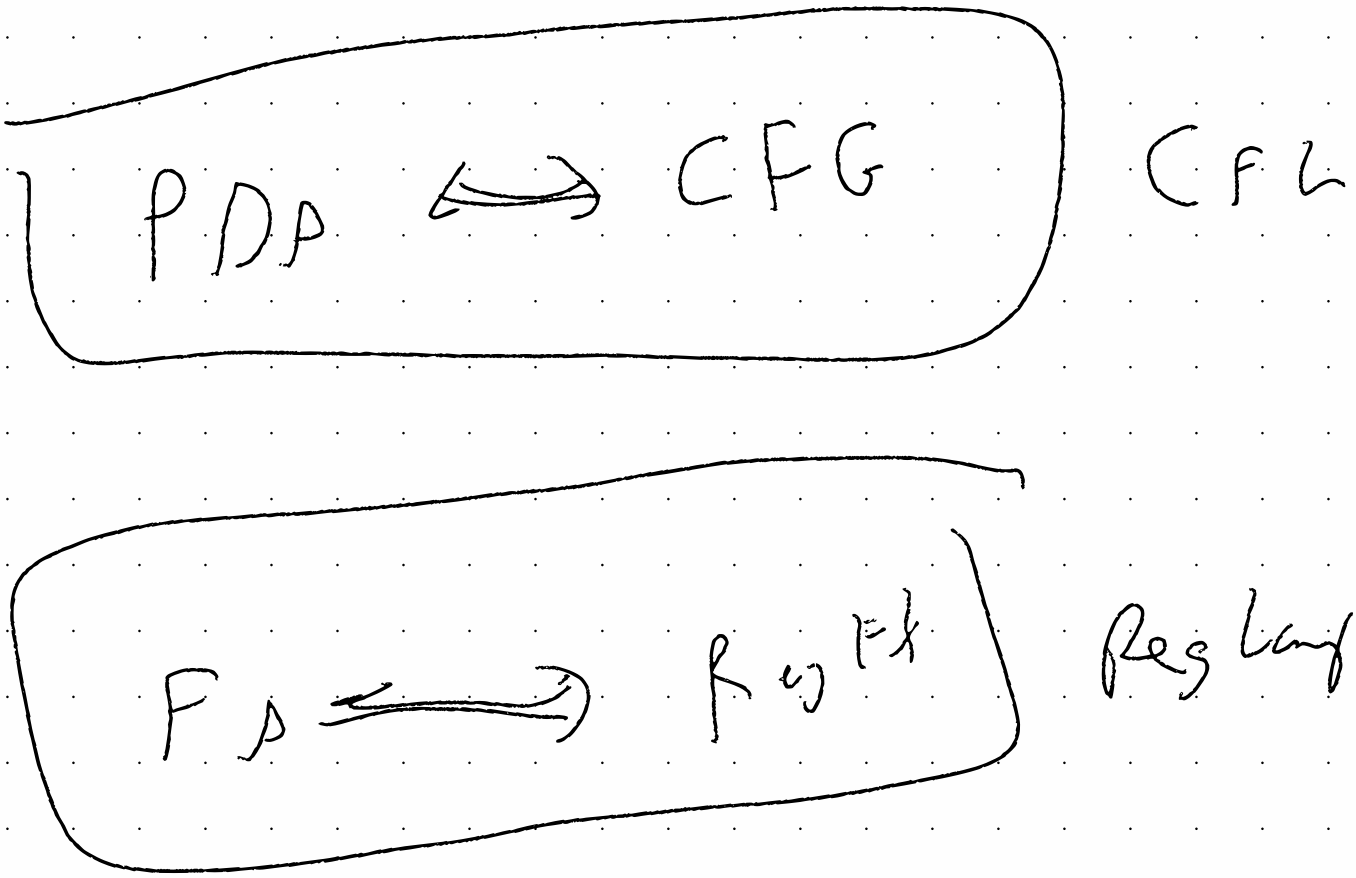
$\exists s \in 2$ - - - pump $b \to 1$

$\{a^i b^i c^i\} \cup \quad d^* e^*$

$a^i b^i c^i$ ...

$\downarrow$ deals




PDA ⟺ CFG
CFL
FA ⟹ Regex
Reg Lang

S → AB → aABb → aabb

S → AB

A → aA | a

B → aBb | b

a | a | b | b