Prove that: Intersection of two CFL or may not be CFL

(i) **May be a CFL** $\quad$ **$L_1 \cap L_2$**

language contained in another

L_1 : Palindrome [odd + Even]

$L_2 : \{a^n \mid n = 1, 2, \ldots\}$

$= \{a, aa, aaa, aaaa, \ldots\}$

$L_2 \subseteq L_1$

$\boxed{L_1 \cap L_2 = L}$

$, \ldots \}$

$\mathcal{L}_2 : \{0^i 1^n 2^n \mid n \geq 1, i \geq 1\} \Rightarrow$

$S_2 \rightarrow 1S_22$

$S \rightarrow S_1 S_2$

$S_1 \rightarrow 0 S_1$

$S_2 \rightarrow 1 S_2 2$

$\mathcal{L}_2$

$\mathcal{L}_2 = \{012, 0012, 001122, 0001122\}$

$\{0^n 1^n 2^n \mid n \geq 1\}$ → using pumping Lemma we have proved that it is n

$\longrightarrow$ (1)

Assume L_1 and L_2 to be two CFLs

$\Longrightarrow$ L_1' and L_2' would also be C

$\Longrightarrow$ $L_1' \cup L_2'$ would also be a CFL (CFL is closed under union)

$\Longrightarrow$ $(L_1' \cup L_2')'$ would also be CFL

But we know, $(L_1' \cup L_2')' = L_1 \cap L_2$ wh is n

i) $\{a^n b^m c^{(n+m)}, n \geq 1, m \geq 1\}$

and

ii) $\{a^n b^{(n+m)} c^m, n \geq 1, m \geq 1\}$

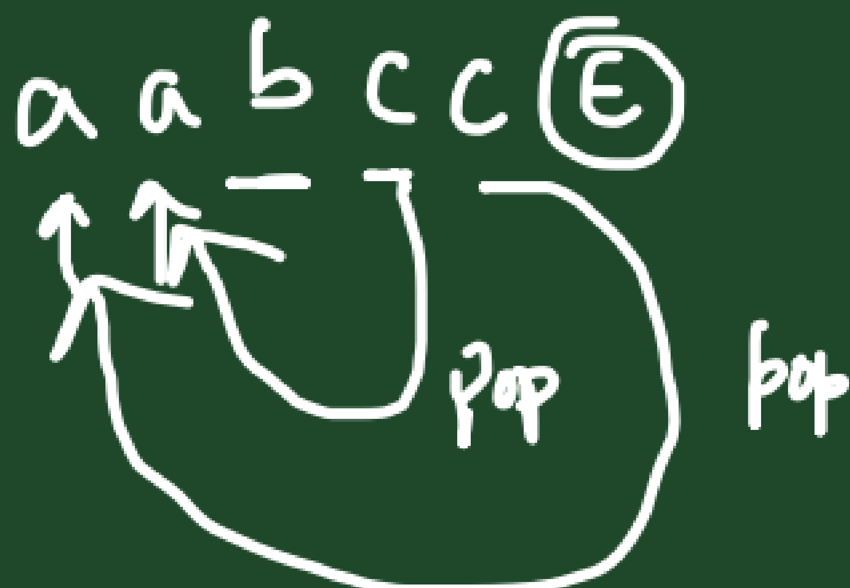
iii) $\{a^{n+m} b^m c^n, n \geq 1, m \geq 1\}$

PDA

1) $\{a^n b^m a^m b^n, n \geq 1, m \geq 1\}$

と，それは


b, a | a
c, a | ε


a a b c c ε
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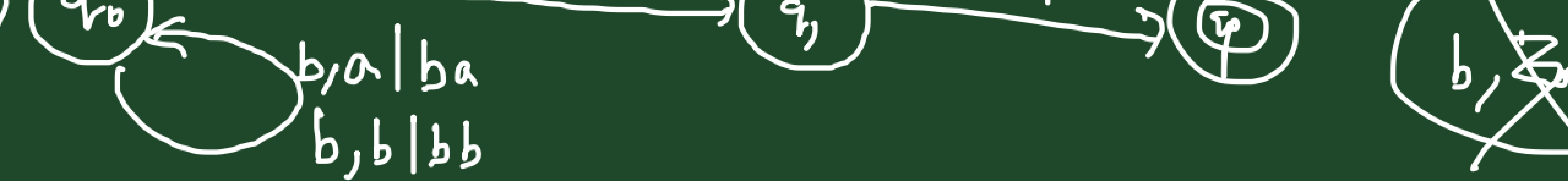
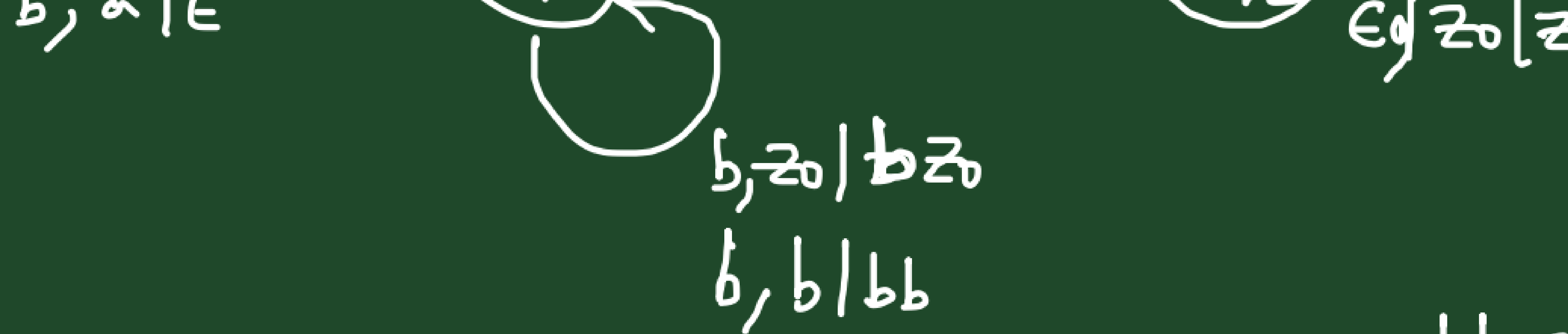


b,a|ba
b,b|bb



aaaaa bb c

v) $a^{n+m} b^m c^n$, $n, m \geq 1$ (HW)

v) $a^n b^m a^m b^n$, $n, m \geq 1$ (HW)