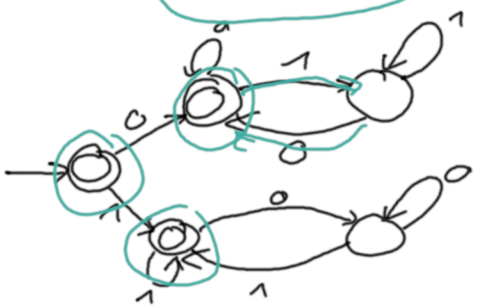
$L_3 = \{w \mid \#_{01}(w) = \#_{10}(w)\}$, $\Sigma = \{0, 1\}$

$\Delta \leq 1$

+1 $\#_{01}$

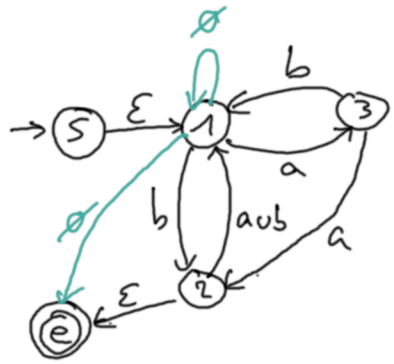
+$\#_{10}$

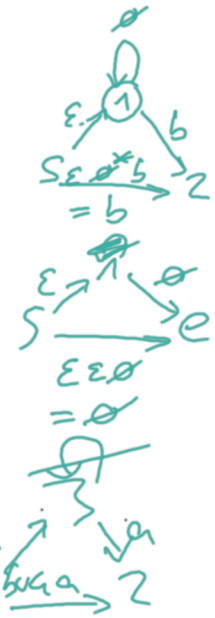
000111010



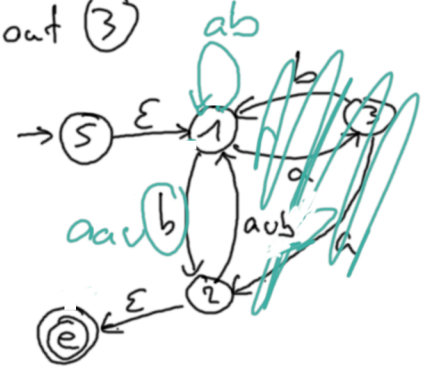
Exercise 1.:

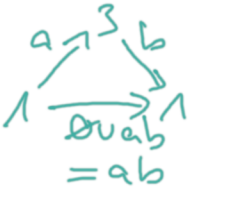
GNFA:



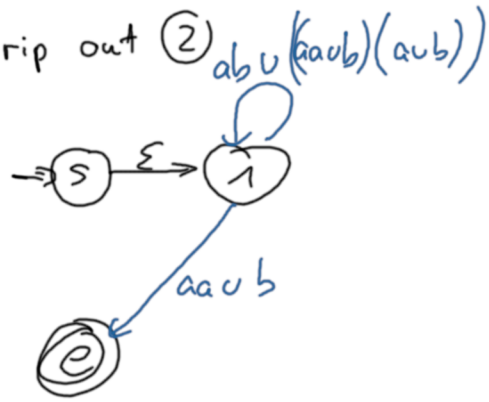


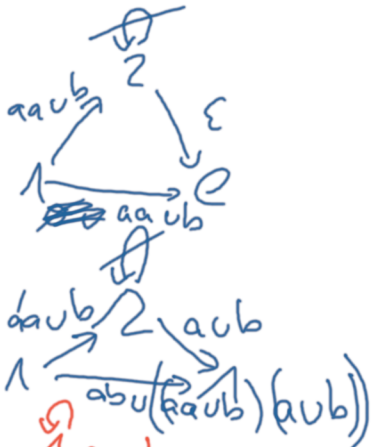
rip out (3)



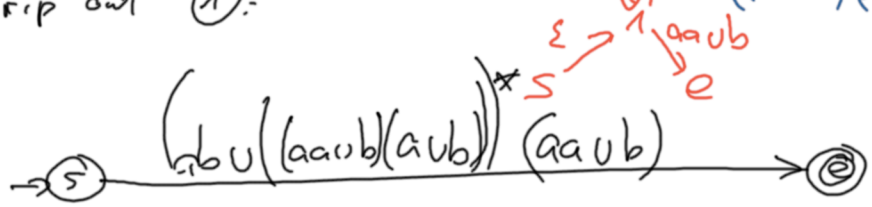


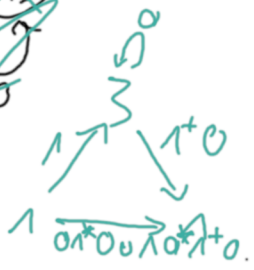
rip out (2)





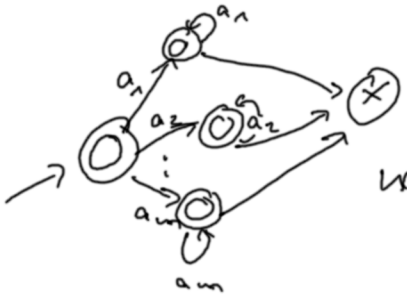
rip out (1):





$\Rightarrow REX = (01^*0 \cup 10^*1^+0)^*10^*$

$a_1^* \cup a_2^* \cup a_3^* \cup \dots \cup a_m^* \qquad a_i \in \Sigma$



$m+2$

$L_1 = 1^*0^+1^+0^* \Rightarrow p_1 \leq p_2$ $\quad p_2 = 4 \Rightarrow w = 1110$ pumpable

$\Rightarrow xyz \dots xz \dots \notin L$

$L_2 = 1^+1^+0^+ \Rightarrow p_2 \geq 4$

$= 5$

$L = L_1 \cup L_2 \Rightarrow p \leq \max\{p_1, p_2\}$

1110 not pumpable in L

$\Rightarrow p > 4, \; p \leq 5$

$1^*0^+1^+0^*$

~~01~~, ~~10~~1, ~~01~~1, 0~~1~~1, 01~~0~~

01000010