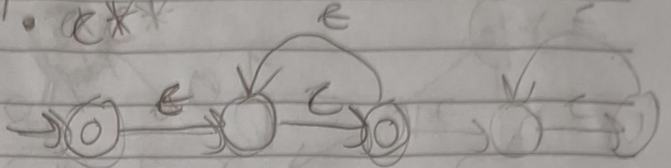
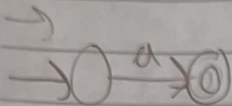


Resolução Lista 05:

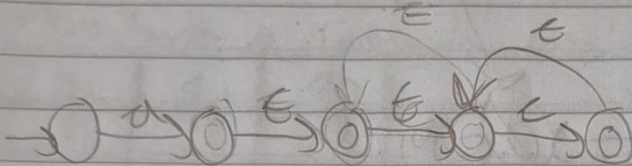
1) Autômato do ER: $(a^*b^*(a|ac^*))^*$

• montando parte por parte:

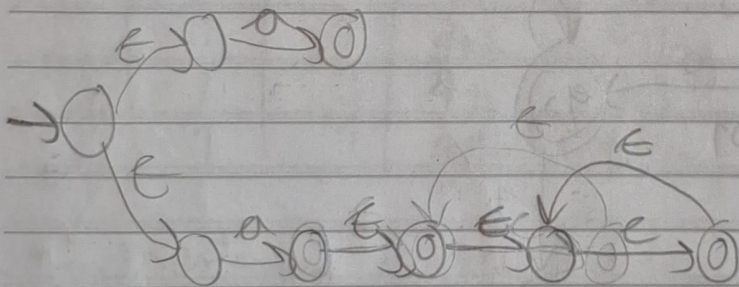
• a



• ac^*

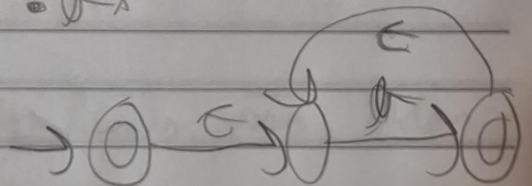
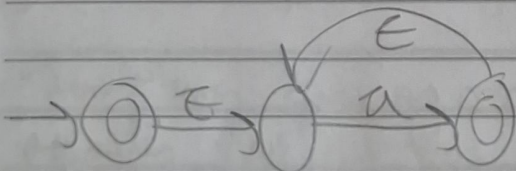


• $a|ac^*$

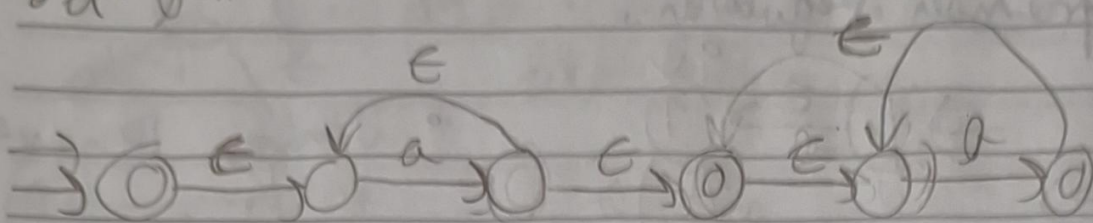


• a^*

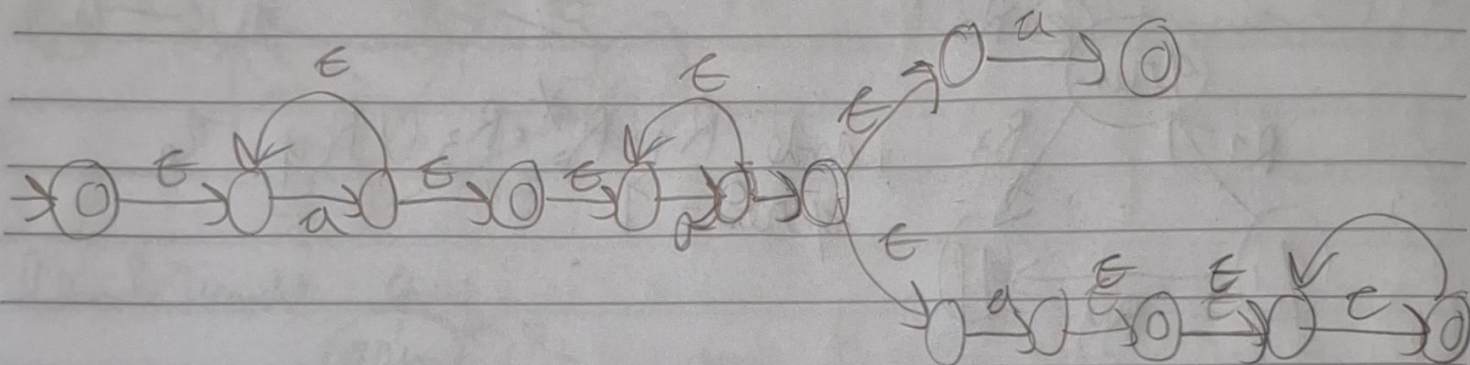
• b^*



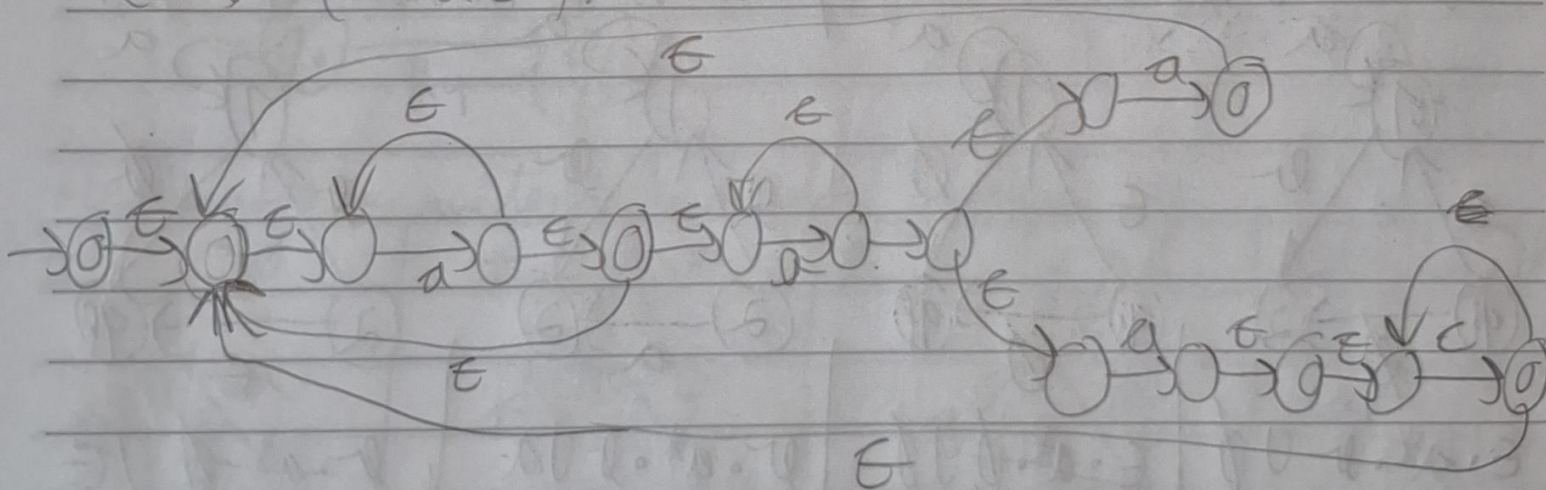
a^*b^*



$a^*b^*(a|ac^*)$

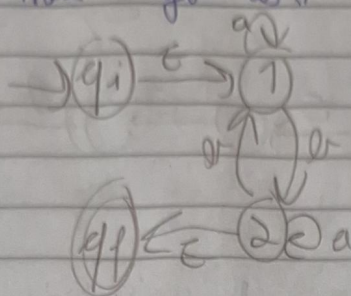
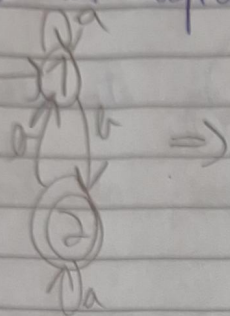


$(a^*b^*(a|ac^*))^*$



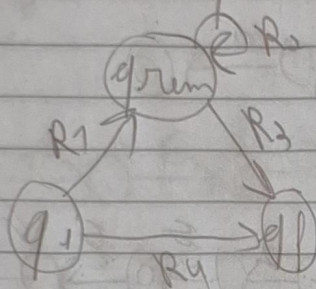
2) Obtener Expresiones Regulares:

a)



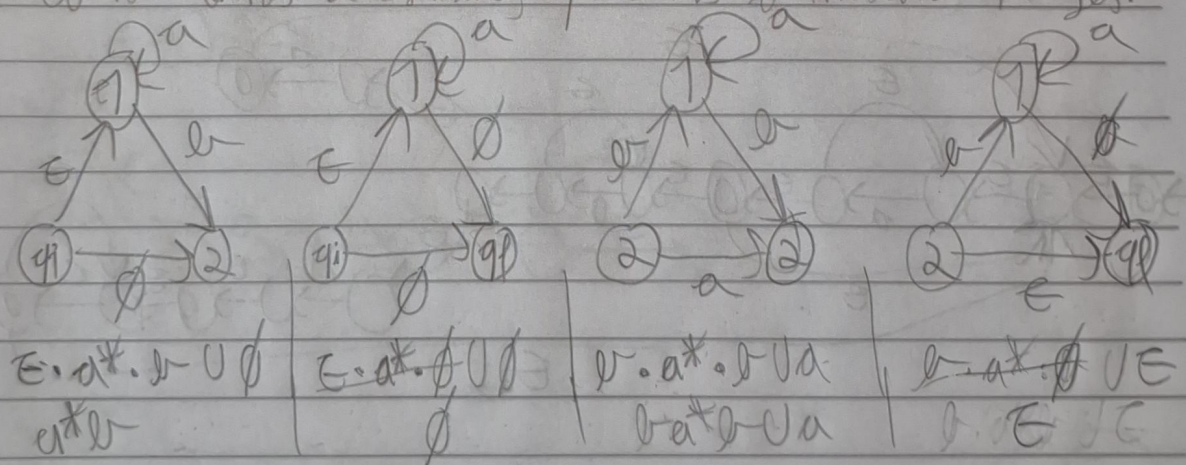
• Vamos a remover a 1.

• Lembrando que:

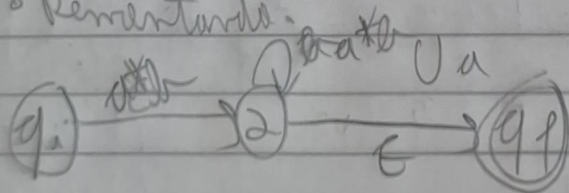


• onde $R_1 = R_3^* \cdot R_3 \cup R_4$
 $q_{rem} = 1$

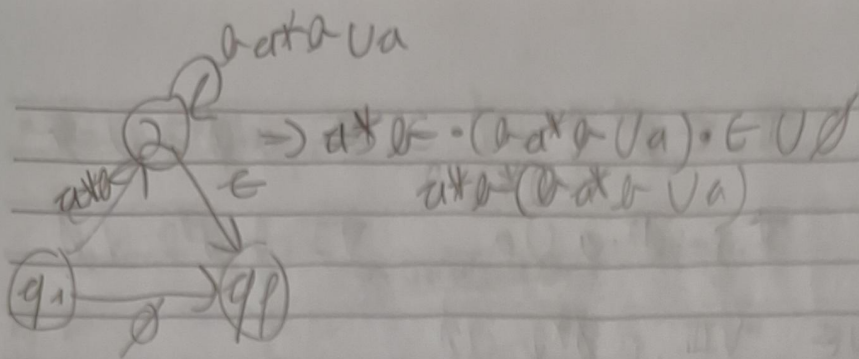
• Como temos 2 estados, aplicamos o método 4 vezes:



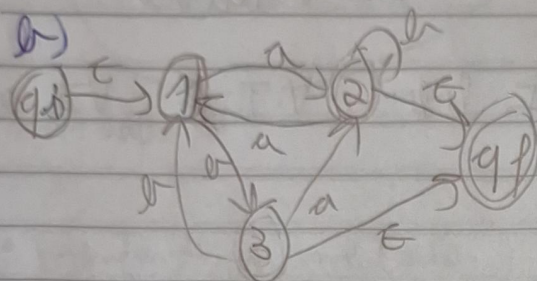
• Lembrando:



• Vamos remover 2:

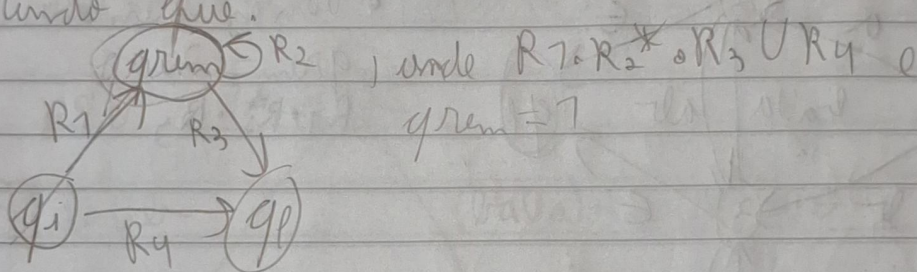


∴ A E.R do autômato é $a^*b \cdot (a^*b \cup a)$

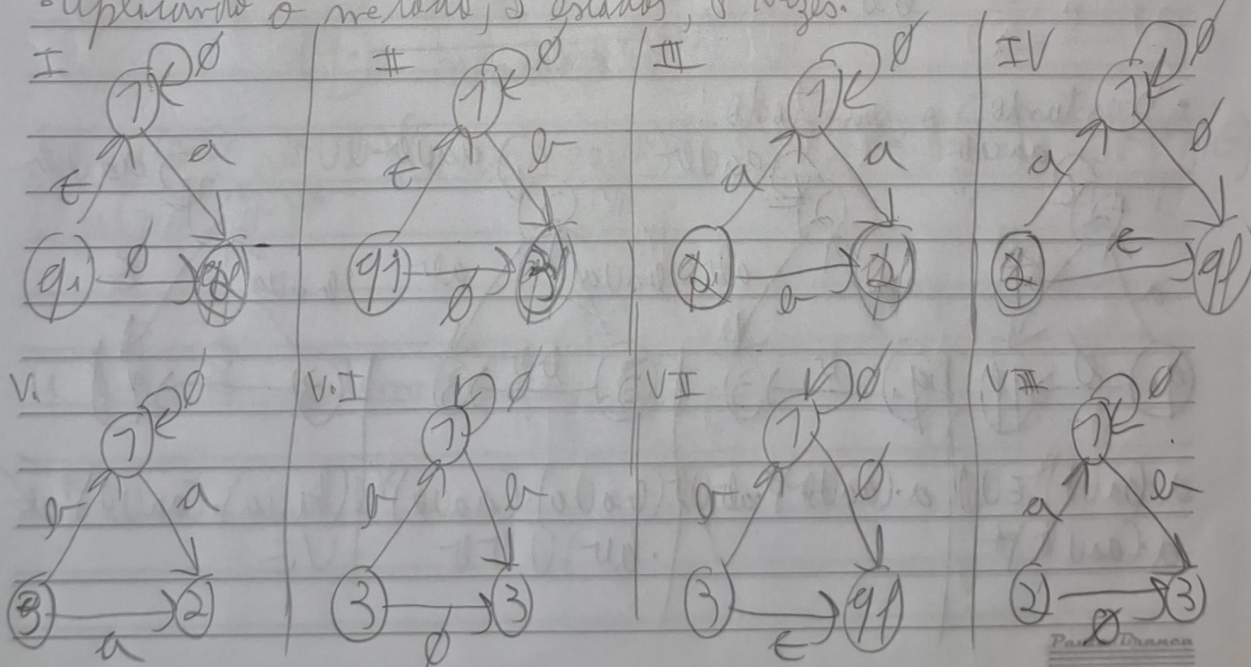


• Vamos remover 1,

lembrando que:



• Aplicando o método, 3 estados, 8 vezes:



I. $\epsilon \cdot \emptyset^* \cdot a \cup \emptyset$ II. $\epsilon \cdot \emptyset^* \cdot b \cup \emptyset$ III. $a \cdot \emptyset^* \cdot a \cup b$
 IV. $a \cdot \emptyset^* \cdot \emptyset \cup \epsilon$ V. $b \cdot \emptyset^* \cdot a \cup a$ VI. $b \cdot \emptyset^* \cdot b \cup \emptyset$
 VII. $b \cdot \emptyset^* \cdot \emptyset \cup \epsilon$ VIII. $a \cdot \emptyset^* \cdot b \cup \emptyset$

• Agrupando as expressões simples:

I. $\epsilon \cdot \epsilon \cdot a \cup \emptyset = a$ II. b III. $a \cdot a \cup b$

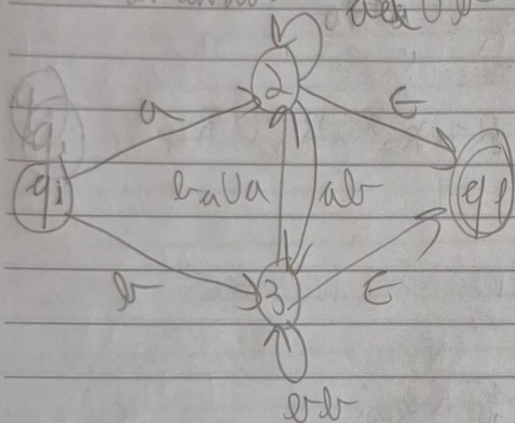
IV. ϵ V. $b \cdot a \cup a$ VI. $b \cdot b$ VII. ϵ VIII. $a \cdot b$

• Removendo:

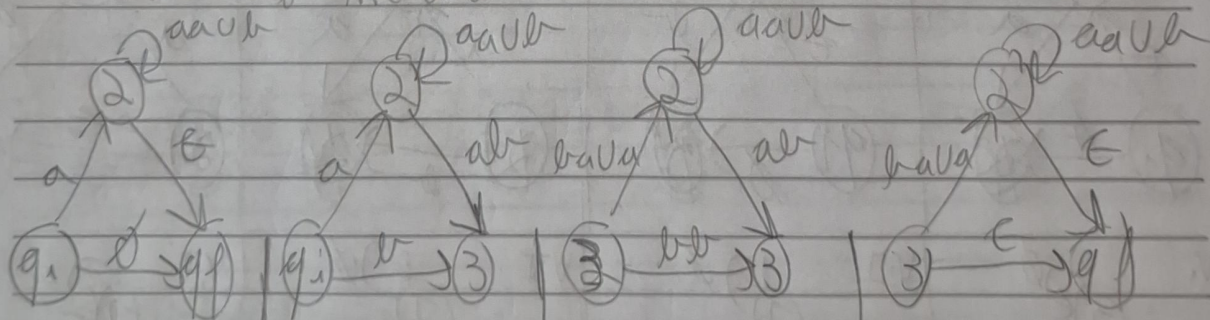
• Vamos remover 2!

$q_{\text{run}} = 2$

$R_1, R_2^*, R_3 \cup R_4$

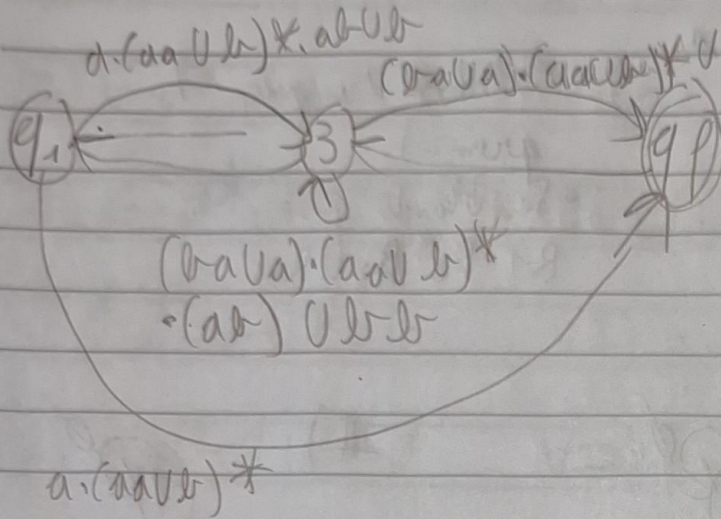


• Montando o método:



$a \cdot (a \cup b)^* \cdot \epsilon \cup b$ $a \cdot (a \cup b)^* \cdot a \cup b$ $(b \cup a) \cdot (a \cup b)^* \cdot b$ $(b \cup a) \cdot (a \cup b)^* \cdot \epsilon$
 $a \cdot (a \cup b)^*$ $\cup \epsilon$ $\cup b$ $\cup \epsilon$

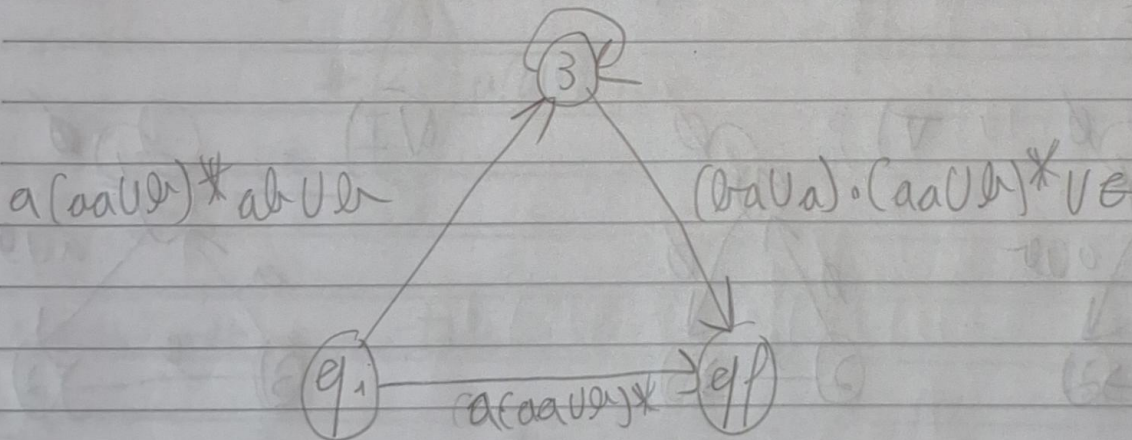
• Removendo:



• Vamos remover o 3:

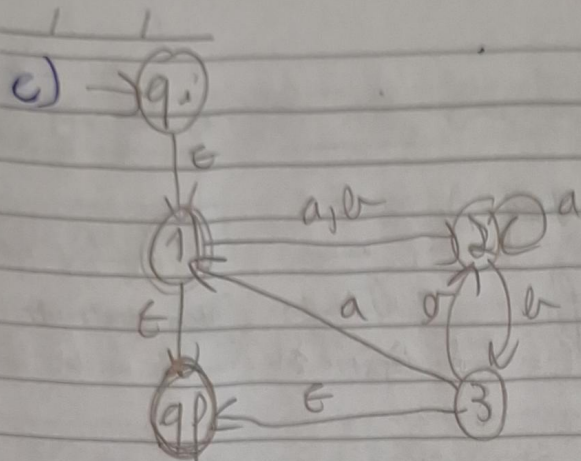
• Tentando o método:

$$((baUa).(aaU)b)^*.(ab)Ubb)^*$$



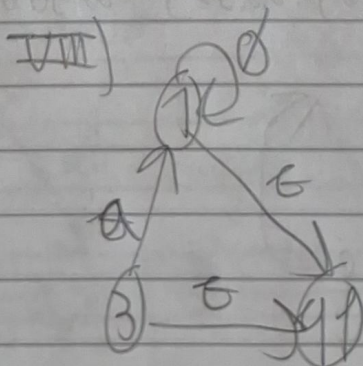
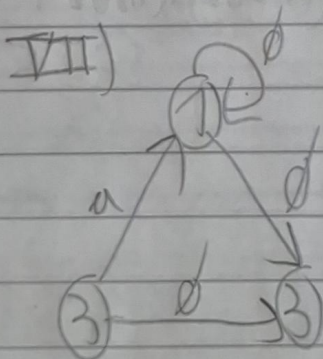
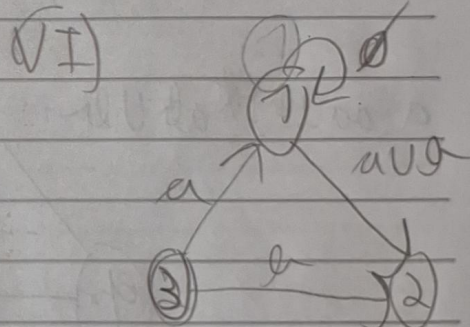
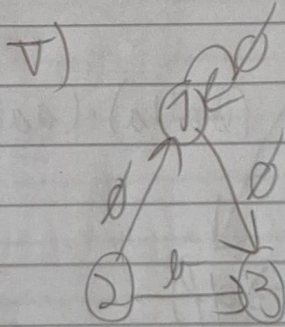
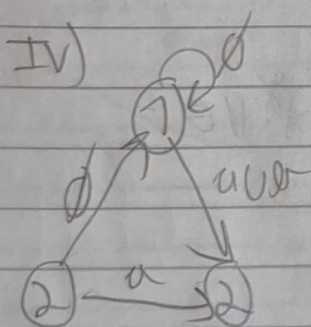
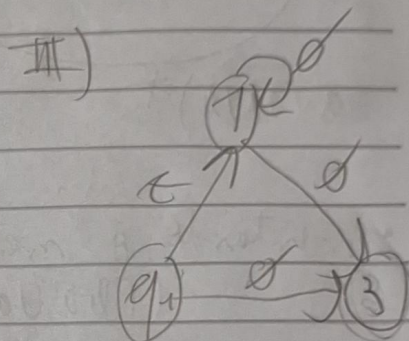
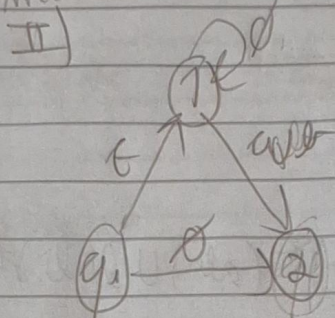
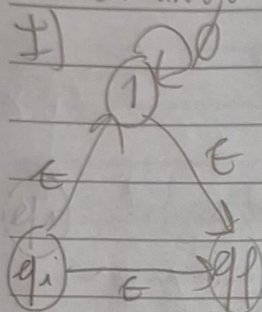
$$(a(aaU)b)^*abU((baUa).(aaU)b)^*.(ab)Ubb)^* \cup a(aaU)b)^*$$

A E.R do autômato é



• Vamos remover 1!
 • Sembrando que:
 $R_1 \circ R_2^* \circ R_3 \cup R_4$

• Montando o método:



• Simplificando:

$$I) \epsilon \cdot \emptyset^* \cdot \epsilon \cup \epsilon = \epsilon \cdot \epsilon \cdot \epsilon \cup \epsilon = \epsilon$$

$$II) \epsilon \cdot \emptyset^* \cdot (a \cup b) \cup \emptyset = \epsilon \cdot \epsilon \cdot (a \cup b) \cup \emptyset = a \cup b$$

$$III) \epsilon \cdot \emptyset^* \cdot \emptyset \cup \emptyset = \emptyset$$

$$IV) \emptyset \cdot \emptyset^* \cdot (a \cup b) \cup a = a$$

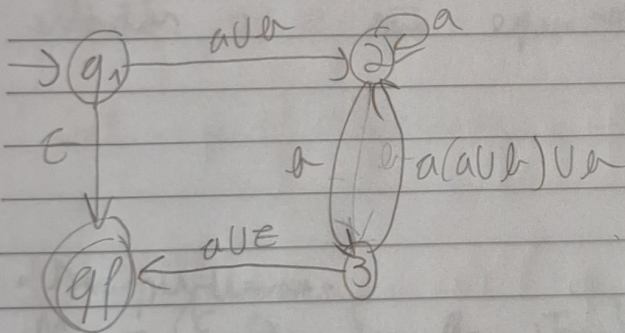
$$V) \emptyset \cdot \emptyset^* \cdot \emptyset \cup a = a$$

$$VI) a \cdot \emptyset^* \cdot (a \cup b) \cup b = a(a \cup b) \cup b$$

$$VII) a \cdot \emptyset^* \cdot \emptyset \cup \emptyset = \emptyset$$

$$VIII) a \cdot \emptyset^* \cdot \epsilon \cup \epsilon = a \cup \epsilon$$

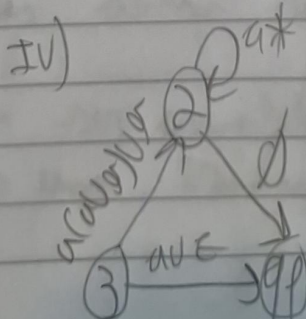
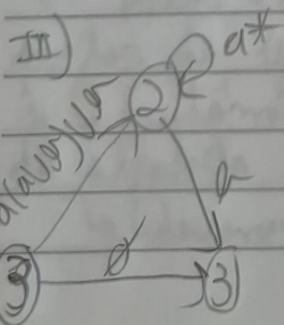
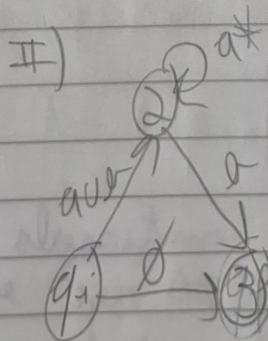
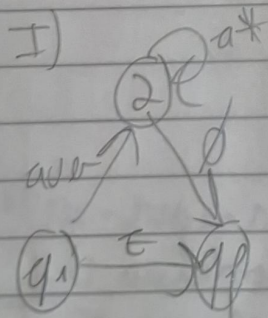
• Mantendo novamente:



• Runny Remover's 2:

• $q_{run} = 2$

• Mantendo o método:



• Calculando as expressões:

$$I) (a \cup b) \cdot a^* \cdot \emptyset \cup \emptyset = \emptyset$$

$$II) (a \cup b) \cdot a^* \cdot b \cup \emptyset = (a \cup b) \cdot a^* \cdot b$$

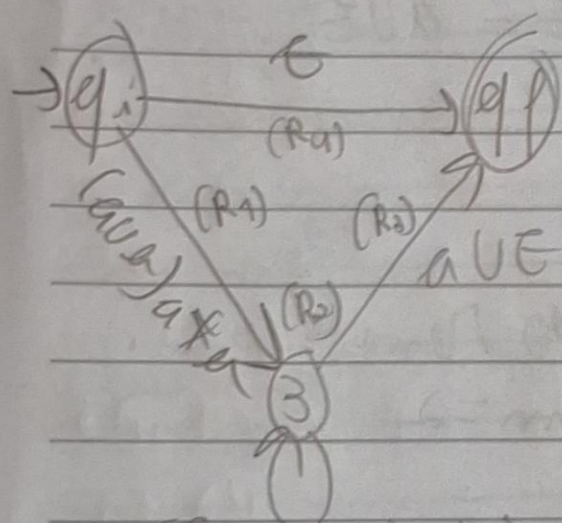
$$III) (a(a \cup b) \cup b) \cdot a^* \cdot b \cup \emptyset = (a(a \cup b) \cup b) \cdot a^* \cdot b$$

$$IV) (a(a \cup b) \cup b) \cdot a^* \cdot \emptyset \cup a \cup b = a \cup b$$

• Remantando:

• Vamos remover 3:

qrem = 3



$$((a(a \cup b) \cup b) \cdot a^* \cdot a)^*$$

• Obtendo a E.R final:

$$(a \cup b) \cdot a^* \cdot ((a(a \cup b) \cup b) \cdot a^* \cdot b)^* \cdot (a \cup b) \cup b$$