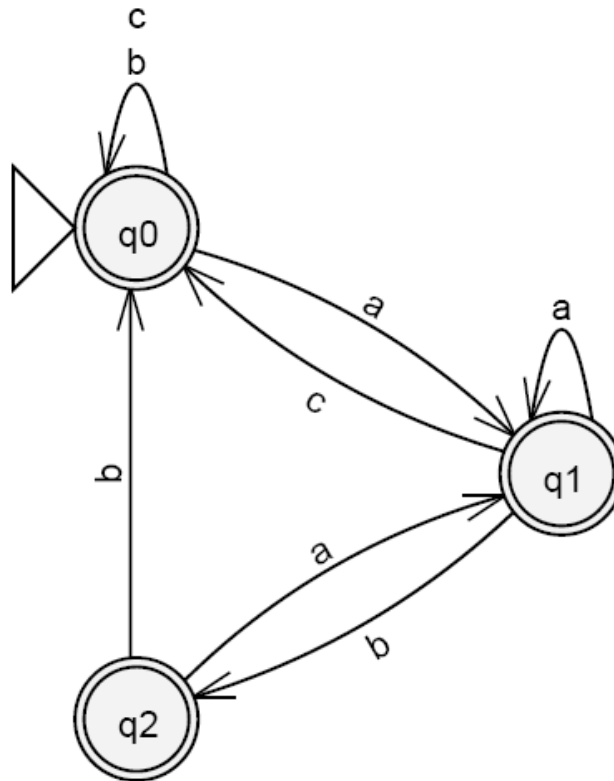


$$L = \{w \in \{a, b, c\}^* \mid w \text{ não contém a subcadeia } abc\}$$



Método indireto: $AF \Rightarrow GLD$

$$\begin{aligned} S &\rightarrow bS \mid cS \mid aX \mid \epsilon \\ X &\rightarrow aX \mid bY \mid cS \mid \epsilon \\ Y &\rightarrow aX \mid bS \mid \epsilon \end{aligned}$$

Método indireto: GLD \Rightarrow ER

$$S \rightarrow bS \mid cS \mid aX \mid \epsilon$$

$$X \rightarrow aX \mid \underbrace{b(aX \mid bS \mid \epsilon)}_Y \mid cS \mid \epsilon$$

$$S \rightarrow bS \mid cS \mid aX \mid \epsilon$$

$$X \rightarrow aX \mid baX \mid bbS \mid b \mid cS \mid \epsilon$$

$$S \rightarrow bS \mid cS \mid aX \mid \epsilon$$

$$X \rightarrow (a \mid ba)^*(bbS \mid b \mid cS \mid \epsilon)$$

$$S \rightarrow bS \mid cS \mid aX \mid \epsilon$$

$$X \rightarrow (a \mid ba)^* bbS \mid (a \mid ba)^* b \mid (a \mid ba)^* cS \mid (a \mid ba)^*$$

$$S \rightarrow bS \mid cS \mid a \underbrace{((a \mid ba)^* bbS \mid (a \mid ba)^* b \mid (a \mid ba)^* cS \mid (a \mid ba)^*)}_X \mid \epsilon$$

$$S \rightarrow bS \mid cS \mid a(a \mid ba)^* bbS \mid a(a \mid ba)^* cS \mid \\ a(a \mid ba)^* b \mid a(a \mid ba)^* \mid \epsilon$$

$$S \rightarrow (\underbrace{b}_{} \mid \underbrace{c}_{} \mid \underbrace{a(a \mid ba)^* bb}_{} \mid \underbrace{a(a \mid ba)^* c}_{})^* \\ (\underbrace{a(a \mid ba)^* b}_{} \mid \underbrace{a(a \mid ba)^*}_{} \mid \underbrace{\epsilon}_{})$$

Método direto: AF \Rightarrow ER

$$\left(\underbrace{b} \mid \underbrace{c} \mid \underbrace{aa^*c} \mid \underbrace{aa^*b(aa^*b)^*(b \mid aa^*c)} \right)^*$$

$$\left(\underbrace{\epsilon} \mid \underbrace{aa^*} \mid \underbrace{aa^*b(aa^*b)^*(\epsilon \mid aa^*)} \right)$$

ou

$$\left(\underbrace{b} \mid \underbrace{c} \mid \underbrace{a(a \mid ba)^*(c \mid bb)} \right)^*$$

$$\left(\underbrace{\epsilon} \mid \underbrace{a(a \mid ba)^*(\epsilon \mid b)} \right)$$