Lista 2 - FTC

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Questão *1.*

$\sum$ = a,b e Pb = b,b

1. **Base:** $\lambda \in$ PB
2. **Passo Recursivo:** W $\in$ PB e α $\sum$ então *WA, AW, BBW, BWB, WBB $\in$ PB
3. **Fechamento:** R é um conjunto de Strings sobre o alfabeto $\sum$ se, e somente se, puder ser atingido a partir de um número finito de execuções dos passos 1 e 2.

Questão *2.*

a)

$$(ba)^* \times (ba) \times (a^* \times b^* \cup a^* \times \lambda)$$
$$(ba)^* \times (ba) \times a^* \times (b^* \cup \lambda)$$
$$(ba)^* \times b \times a \times a^* \times (b^* \cup \lambda)$$
$$(ba)^* \times b \times (a^+) \times (b^* \cup \lambda)$$
$$(ba)^* \times b \times a^+ \times (b^* \cup \lambda)$$

b)

$$b^+ \times (a^* \times b^*) \times b$$
$$b^* \times b \times (a^* \times b) \times b^* \times b$$
$$b(b^* \times a^* \cup \lambda) \times b^+$$

Questão *3.*

a)

$$a \times a^{+} \cup b^{+} \times a^{+} \times b^{+}$$

b)

$$(a \cup b)^{*} \times a \times a \times (a \cup b)^{*}$$

c)

$$(b^{*} \cup a \times b)^{*} \times a \times a \times (b^{*} \cup b \times a)^{*}$$

d)

$$a \times (a \cup c)^{*} \times b \times (a \cup c)^{*} \times b \times (a \cup c)^{*} \times c \times c$$

e)

$$((a \cup b)^{*} \times a \times b \times (a \cup b)^{*} \times b \times a \times (a \cup b)^{*} \cup (a \cup b)^{*} \times b \times a \times (a \cup b)^{*} \times a \times b \times (a \cup b)^{*})) \cup$$
$$((a \cup b)^{*} \times a \times b \times a \times (a \cup b)^{*} \cup (a \cup b)^{*} \times b \times a \times b \times (a \cup b)^{*})$$

f)

$$\begin{aligned}
&((a \cup b \cup c)^{*} \times a \times a \times (a \cup b \cup c)^{*} \times b \times b \times (a \cup b \cup c)^{*} \times c \times c) \cup \\
&((a \cup b \cup c)^{*} \times a \times a \times (a \cup b \cup c)^{*} \times c \times c \times (a \cup b \cup c)^{*} \times b \times b) \cup \\
&((a \cup b \cup c)^{*} \times b \times b \times (a \cup b \cup c)^{*} \times a \times a \times (a \cup b \cup c)^{*} \times c \times c) \cup \\
&((a \cup b \cup c)^{*} \times b \times b \times (a \cup b \cup c)^{*} \times c \times c \times (a \cup b \cup c)^{*} \times a \times a) \cup \\
&((a \cup b \cup c)^{*} \times c \times c \times (a \cup b \cup c)^{*} \times b \times b \times (a \cup b \cup c)^{*} \times a \times a) \cup \\
&((a \cup b \cup c)^{*} \times c \times c \times (a \cup b \cup c)^{*} \times a \times a \times (a \cup b \cup c)^{*} \times b \times b) \cup
\end{aligned}$$

g)

$$(a^{*} \cup b \times c \cup c^{*})^{*}$$

h)

$$(a \cup b \cup c) \times (a \cup b \cup c) \times (a \cup b \cup c)$$

i)

$$(\lambda \cup a \cup b \cup c) \times (\lambda \cup a \cup b \cup c)$$

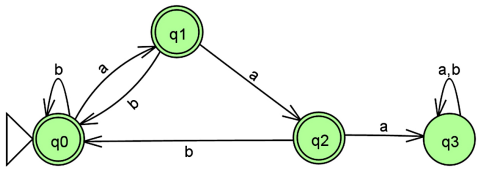
j)

$$(a \cup b \cup c)^{*} \times (a \cup b \cup c) \times (a \cup b \cup c) \times (a \cup b \cup c) \times (a \cup b \cup c)^{*} \times$$

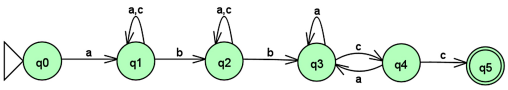
k) Não existe

Questão *4.*

a)

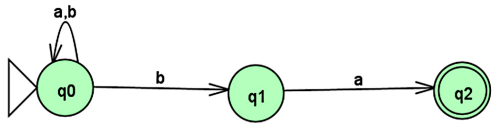


b)

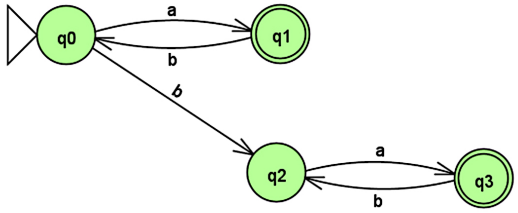


Questão *5.*

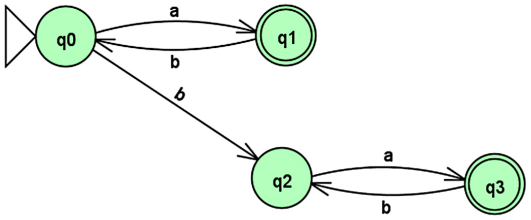
a)



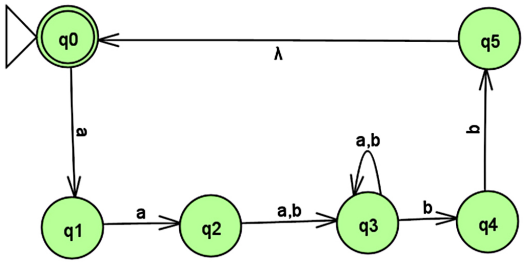
b)



c)

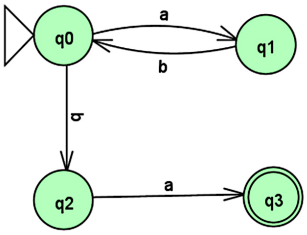


d)

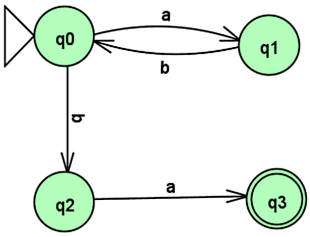


Questão *6.*

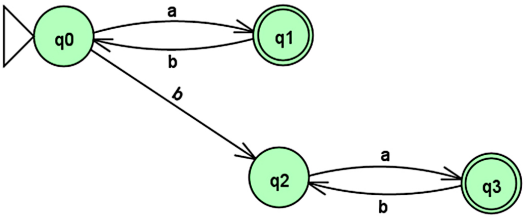
a)



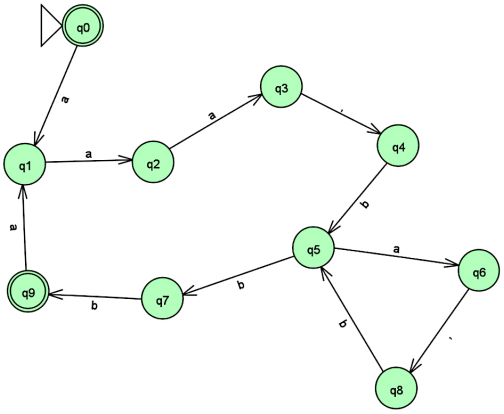
b)



c)



d)



Questão 7.

a) Hipótese: $L = \{0^n\ 1^m | m, n \geq 0\}$ é regular

0* 1*

Existe um AFD-M com K estados tal que L(M) = L.

Ex: w = $0^K\ 1^K \in L$

w tem que ser reconhecido pela máquina M, ou seja, w ∈ L(M)

|w| >= K, pois |w| = 2k

$$1) w = pvq$$
$$2) |pv| \leq k$$
$$3) |v| > 0, v \neq \lambda$$
$$4) w_i = p(v)^i q \in L \forall i \geq 0$$

Resultado: Sim, é regular

b) Hipótese: $L = \{0^n\ 1^m\ 0^n | m, n \geq 0\}$ é regular

0* 1* 0*

Existe um AFD-M com K estados tal que L(M) = L.

Ex: w = $0^K\ 10^K \in L$

w tem que ser reconhecido pela máquina M, ou seja, w ∈ L(M)

|w| >= K, pois |w| = 2k + 1

$$1) w = pvq$$
$$2) |pv| \leq k$$
$$3) |v| > 0, v \neq \lambda$$
$$4) w_i = p(v)^i q \in L \forall i \geq 0$$

Resultado: Não, não é regular