

**Lista EXTRA (Atividade Avaliativa individual) - Teoria da Computação e Autômatos**

**Professora: Elvira Padua Lovatte**

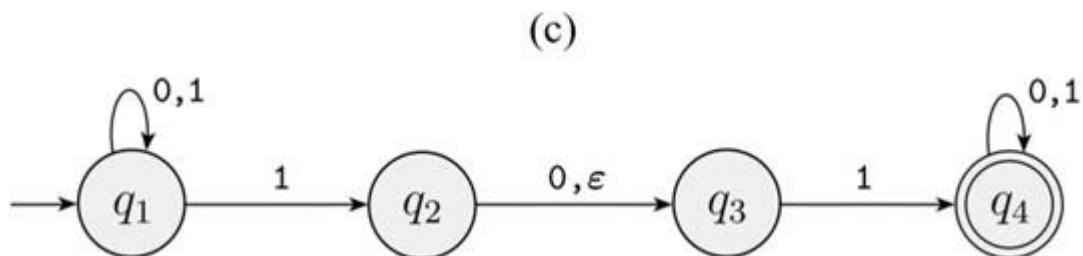
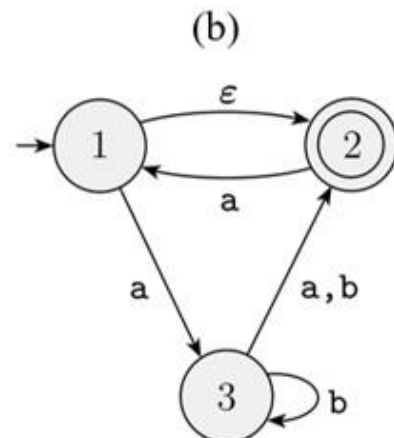
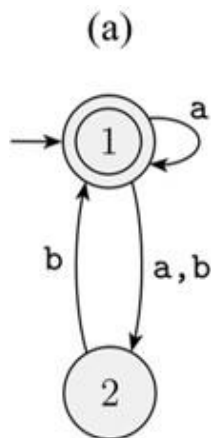
**Curso: Ciência da Computação**

**DATA de entrega : até 2 de outubro**

**Valor : até 2 pontos**

**Nome : Erick Cypreste de Almeida**

**1) Converta os AFNs abaixo para AFDs (ESCOLHA um dos itens e faça um vídeo explicando a resolução passo a passo)**

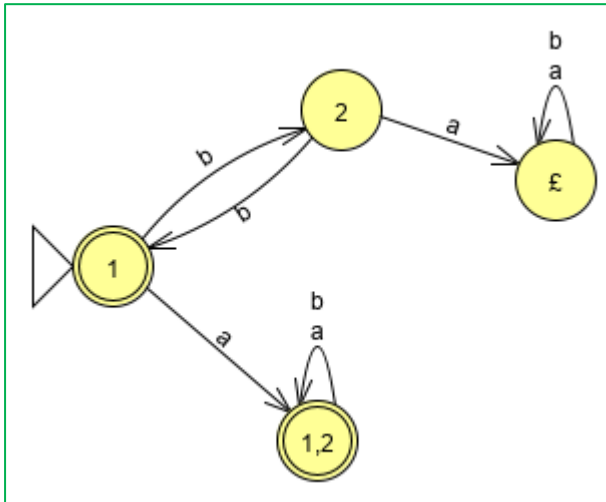


A)

AFND:  $Q = \{1, 2\}$

AFD:  $Q' = \{\epsilon, \{1\}, \{2\}, \{1,2\}\}$

Estado	a	b
$\epsilon$	$\epsilon$	$\epsilon$
$\{1\}^* \leftarrow$	$\{1,2\}$	$\{2\}$
$\{2\}$	$\epsilon$	$\{1\}$
$\{1,2\}^*$	$\{1,2\}$	$\{1,2\}$

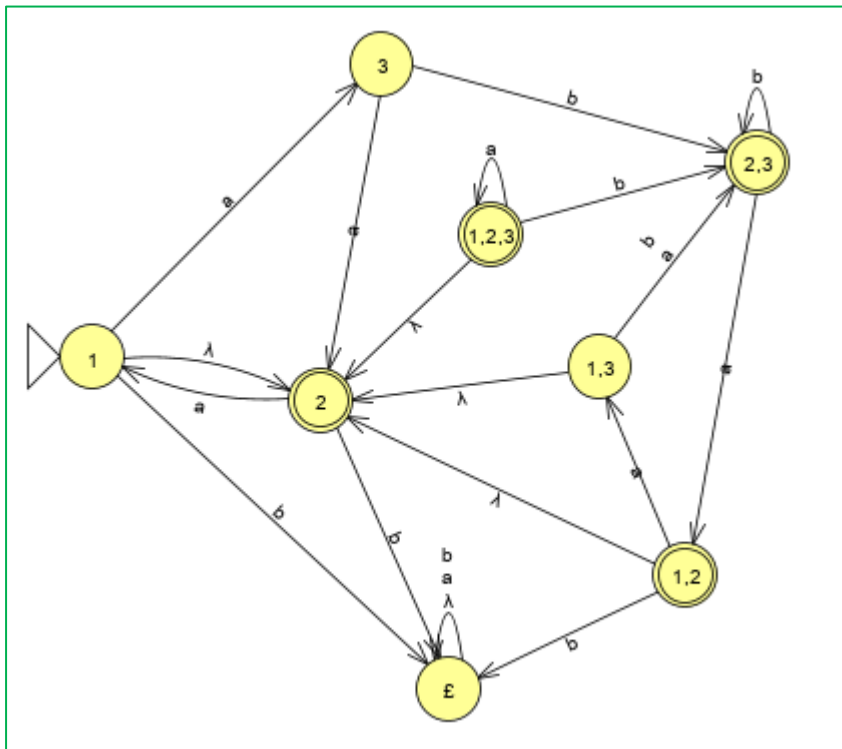


**B)**

**AFND:**  $Q = \{1, 2, 3\}$

**AFD:**  $Q' = \{\epsilon, \{1\}, \{2\}, \{3\}, \{1,2\}, \{1,3\}, \{2,3\}, \{1,2,3\}\}$

Estado	$\epsilon$	a	b
$\epsilon$	$\epsilon$	$\epsilon$	$\epsilon$
$\{1\} \leftarrow$	$\{2\}$	$\{3\}$	$\epsilon$
$\{2\}^*$	$\epsilon$	$\{1\}$	$\epsilon$
$\{3\}$	$\epsilon$	$\{2\}$	$\{2,3\}$
$\{1,2\}^*$	$\{2\}$	$\{1,3\}$	$\epsilon$
$\{1,3\}$	$\{2\}$	$\{2,3\}$	$\{2,3\}$
$\{2,3\}^*$	$\epsilon$	$\{1,2\}$	$\{2,3\}$
$\{1,2,3\}^*$	$\{2\}$	$\{1,2,3\}$	$\{2,3\}$

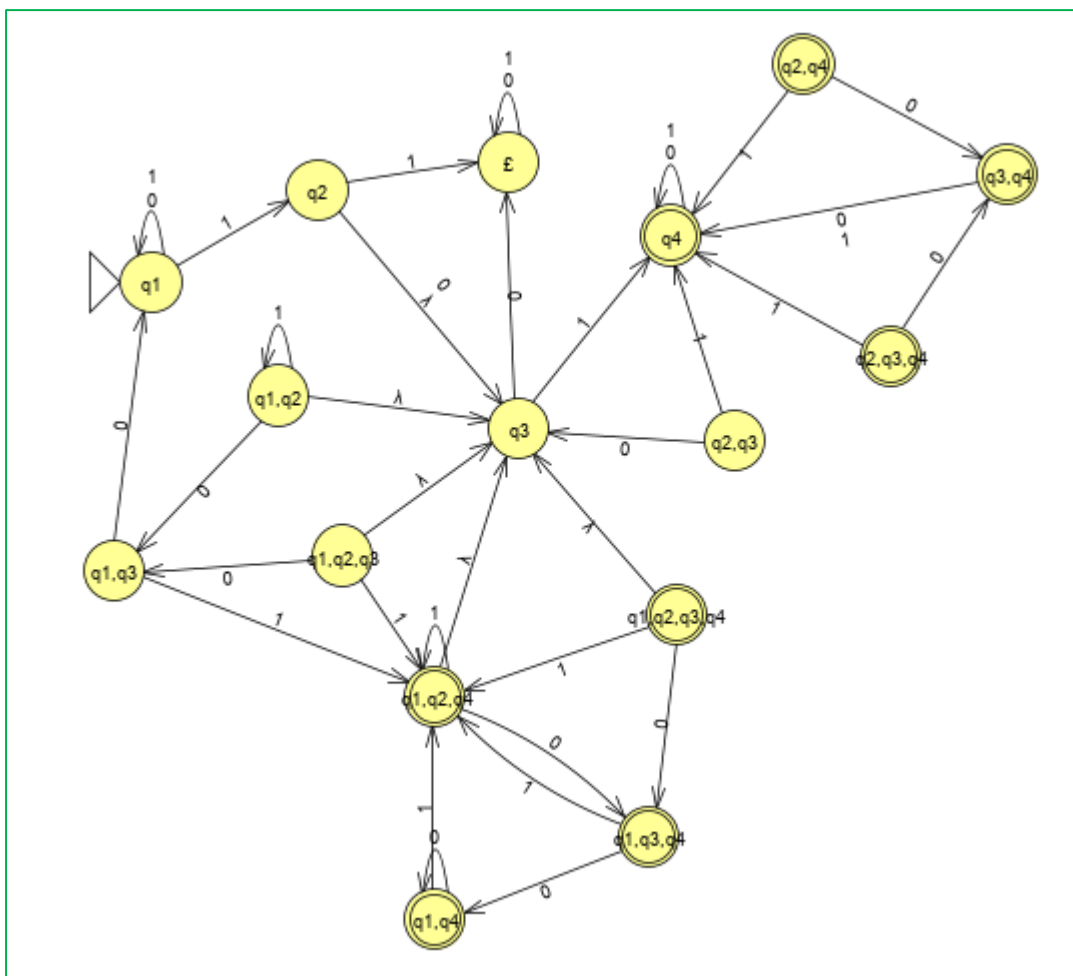


C)

AFND:  $Q = \{q1, q2, q3, q4\}$

AFD:  $Q' = \{\epsilon, \{q1\}, \{q2\}, \{q3\}, \{q4\}, \{q1,q2\}, \{q1,q3\}, \{q1,q4\}, \{q2,q3\}, \{q2,q4\}, \{q3,q4\}, \{q1,q2,q3\}, \{q1,q2,q4\}, \{q1,q3,q4\}, \{q2,q3,q4\}, \{q1,q2,q3,q4\}\}$

Estado	$\epsilon$	0	1
$\epsilon$	$\epsilon$	$\epsilon$	$\epsilon$
$\{q1\} \leftarrow$	$\epsilon$	$\{q1\}$	$\{q1,q2\}$
$\{q2\}$	$\{q3\}$	$\{q3\}$	$\epsilon$
$\{q3\}$	$\epsilon$	$\epsilon$	$\{q4\}$
$\{q4\}^*$	$\epsilon$	$\{q4\}$	$\{q4\}$
$\{q1,q2\}$	$\{q3\}$	$\{q1,q3\}$	$\{q1,q2\}$
$\{q1,q3\}$	$\epsilon$	$\{q1\}$	$\{q1,q2,q4\}$
$\{q1,q4\}^*$	$\epsilon$	$\{q1,q4\}$	$\{q1,q2,q4\}$
$\{q2,q3\}$	$\epsilon$	$\{q3\}$	$\{q4\}$
$\{q2,q4\}^*$	$\epsilon$	$\{q3,q4\}$	$\{q4\}$
$\{q3,q4\}^*$	$\epsilon$	$\{q4\}$	$\{q4\}$
$\{q1,q2,q3\}$	$\{q3\}$	$\{q1,q3\}$	$\{q1,q2,q4\}$
$\{q1,q2,q4\}^*$	$\{q3\}$	$\{q1,q3,q4\}$	$\{q1,q2,q4\}$
$\{q1,q3,q4\}^*$	$\epsilon$	$\{q1,q4\}$	$\{q1,q2,q4\}$
$\{q2,q3,q4\}^*$	$\epsilon$	$\{q3,q4\}$	$\{q4\}$
$\{q1,q2,q3,q4\}^*$	$\{q3\}$	$\{q1,q3,q4\}$	$\{q1,q2,q4\}$

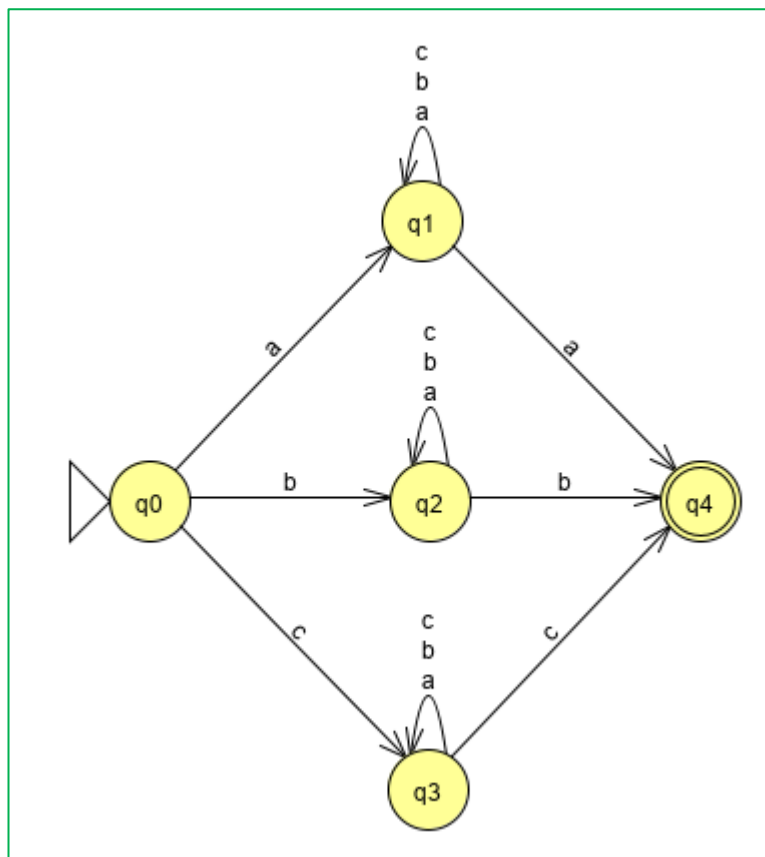


2) Seja o alfabeto  $\Sigma = \{a, b, c\}$  e a linguagem  $L = \{w \in \Sigma^* / \text{o primeiro símbolo de } w \text{ é igual ao último símbolo de } w\}$ .

a) Escreva uma expressão regular que representa genericamente os elementos de L

$a(a+b+c)^*a + b(a+b+c)^*b + c(a+b+c)^*c$

b) Desenvolva um autômato finito não determinístico N que reconheças L.



c) Converta N em um AFD.

**AFND:**  $Q = \{q_0, q_1, q_2, q_3, q_4\}$

**AFD:**  $Q' = \{\epsilon, \{q_0\}, \{q_1\}, \{q_2\}, \{q_3\}, \{q_4\}, \{q_0, q_1\}, \{q_0, q_2\}, \{q_0, q_3\}, \{q_0, q_4\}, \{q_1, q_2\}, \{q_1, q_3\}, \{q_1, q_4\}, \{q_2, q_3\}, \{q_2, q_4\}, \{q_3, q_4\}, \{q_0, q_1, q_2\}, \{q_0, q_1, q_3\}, \{q_0, q_1, q_4\}, \{q_0, q_2, q_3\}, \{q_0, q_2, q_4\}, \{q_0, q_3, q_4\}, \{q_1, q_2, q_3\}, \{q_1, q_2, q_4\}, \{q_1, q_3, q_4\}, \{q_2, q_3, q_4\}, \{q_0, q_1, q_2, q_3\}, \{q_0, q_1, q_2, q_4\}, \{q_0, q_1, q_3, q_4\}, \{q_0, q_2, q_3, q_4\}, \{q_1, q_2, q_3, q_4\}, \{q_0, q_1, q_2, q_3, q_4\}\}$

Estado	a	b	c
$\epsilon$	$\epsilon$	$\epsilon$	$\epsilon$
$\{q_0\} \leftarrow$	$\{q_1\}$	$\{q_2\}$	$\{q_3\}$
$\{q_1\}$	$\{q_1, q_4\}$	$\{q_1\}$	$\{q_1\}$
$\{q_2\}$	$\{q_2\}$	$\{q_2, q_4\}$	$\{q_2\}$
$\{q_3\}$	$\{q_3\}$	$\{q_3\}$	$\{q_3, q_4\}$
$\{q_4\}^*$	$\epsilon$	$\epsilon$	$\epsilon$

$\{q_0, q_1\}$	$\{q_1, q_4\}$	$\{q_1, q_2\}$	$\{q_1, q_3\}$
$\{q_0, q_2\}$	$\{q_1, q_2\}$	$\{q_2, q_4\}$	$\{q_2, q_3\}$
$\{q_0, q_3\}$	$\{q_1, q_3\}$	$\{q_2, q_3\}$	$\{q_3, q_4\}$
$\{q_0, q_4\}^*$	$\{q_1\}$	$\{q_2\}$	$\{q_3\}$
$\{q_1, q_2\}$	$\{q_1, q_2, q_4\}$	$\{q_1, q_2, q_4\}$	$\{q_1, q_2\}$
$\{q_1, q_3\}$	$\{q_1, q_3, q_4\}$	$\{q_1, q_3\}$	$\{q_1, q_3, q_4\}$
$\{q_1, q_4\}^*$	$\{q_1, q_4\}$	$\{q_1\}$	$\{q_1\}$
$\{q_2, q_3\}$	$\{q_2, q_3\}$	$\{q_2, q_3, q_4\}$	$\{q_2, q_3, q_4\}$
$\{q_2, q_4\}^*$	$\{q_2\}$	$\{q_2, q_4\}$	$\{q_2\}$
$\{q_3, q_4\}^*$	$\{q_3\}$	$\{q_3\}$	$\{q_3, q_4\}$
$\{q_0, q_1, q_2\}$	$\{q_1, q_2, q_4\}$	$\{q_1, q_2, q_4\}$	$\{q_1, q_2, q_3\}$
$\{q_0, q_1, q_3\}$	$\{q_1, q_3, q_4\}$	$\{q_1, q_2, q_3\}$	$\{q_1, q_3, q_4\}$
$\{q_0, q_1, q_4\}^*$	$\{q_1, q_4\}$	$\{q_1, q_2\}$	$\{q_1, q_3\}$
$\{q_0, q_2, q_3\}$	$\{q_1, q_2, q_3\}$	$\{q_2, q_3, q_4\}$	$\{q_2, q_3, q_4\}$
$\{q_0, q_2, q_4\}^*$	$\{q_1, q_2\}$	$\{q_2, q_4\}$	$\{q_2, q_3\}$
$\{q_0, q_3, q_4\}^*$	$\{q_1, q_3\}$	$\{q_2, q_3\}$	$\{q_3, q_4\}$
$\{q_1, q_2, q_3\}$	$\{q_1, q_2, q_3, q_4\}$	$\{q_1, q_2, q_3, q_4\}$	$\{q_1, q_2, q_3, q_4\}$
$\{q_1, q_2, q_4\}^*$	$\{q_1, q_2, q_4\}$	$\{q_1, q_2, q_4\}$	$\{q_1, q_2\}$
$\{q_1, q_3, q_4\}^*$	$\{q_1, q_3, q_4\}$	$\{q_1, q_3\}$	$\{q_1, q_3, q_4\}$
$\{q_2, q_3, q_4\}^*$	$\{q_2, q_3\}$	$\{q_2, q_3, q_4\}$	$\{q_2, q_3, q_4\}$
$\{q_0, q_1, q_2, q_3\}$	$\{q_1, q_2, q_3, q_4\}$	$\{q_1, q_2, q_3, q_4\}$	$\{q_1, q_2, q_3, q_4\}$
$\{q_0, q_1, q_2, q_4\}^*$	$\{q_1, q_2, q_4\}$	$\{q_1, q_2, q_4\}$	$\{q_1, q_2, q_3\}$
$\{q_0, q_1, q_3, q_4\}^*$	$\{q_1, q_3, q_4\}$	$\{q_1, q_2, q_3\}$	$\{q_1, q_3, q_4\}$
$\{q_0, q_2, q_3, q_4\}^*$	$\{q_1, q_2, q_3\}$	$\{q_2, q_3, q_4\}$	$\{q_2, q_3, q_4\}$
$\{q_1, q_2, q_3, q_4\}^*$	$\{q_1, q_2, q_3, q_4\}$	$\{q_1, q_2, q_3, q_4\}$	$\{q_1, q_2, q_3, q_4\}$
$\{q_0, q_1, q_2, q_3, q_4\}^*$	$\{q_1, q_2, q_3, q_4\}$	$\{q_1, q_2, q_3, q_4\}$	$\{q_1, q_2, q_3, q_4\}$

