

Marco Lúcio Alves de Barros

LISTA_1_EXERCICIO_1_LETRA_a

$$\{ab, c\}^* = \{\phi, ab, c, abc, cc, abab, \dots\}$$

LISTA_1_EXERCICIO_1 LETRA_B

$$\{a, b, c\}^* = \{\emptyset, a, b, c, ab, ac, aa, \dots\}$$

LISTA_1_EXERCICIO_1_LETRA_C

$\{abc\}^* = \{ \varnothing, abc, abcabc, abcababc, \dots \}$

LISTA_1_EXERCICIO_2_LETRA_a

$$\{a, b\} \cup \{c, d\} = \{a, b, c, d\}$$

LISTA_1_EXERCICIO_2 - LETRA_L

$$\{100, 010, 110\} \cup \{00, 01, 11\} = \{100, 010, 110, 00, 01, 11\}$$

LISTA_1 - EXERCICIO_2 - LETRA_C

$$\{101, 110\} \cdot \{00, 11\} = \{10100, 10111, 11000, 11011\}$$

LISTA - I - EXERCICIO - 2 - LETRA - d

En Anab, Emanu, Gabi, Isab, Rafa's: En Anabels, Emanuela, gabriela
Isabela, Rafaela's

LISTA - I - EXERCICIO - 3 - LETRA - a

$\Sigma^2 = \{ \text{ff}, \text{fd}, \text{fd}, \text{ff}, \text{dd}, \text{dd}, \text{dd}, \text{dd}, \text{dd} \}$

LISTA-1-EXERCICIO-3-LETRA-Q FEITO CERTO DEPOIS

$$\Sigma^3 = \{ \text{d} \text{d} \text{d} \text{d}, \text{d} \text{d} \text{d}, \text{d} \text{d} \text{d}, \dots \}$$

LISTA - 1 - EXERCÍCIO - 3 - LETRA - c

$$\Sigma^2 \cup \Sigma^2 = \{ \text{ff}, \text{fd}, \text{fb}, \text{dd}, \text{db}, \text{bb}, \text{bd}, \text{fb}, \text{fb}, \text{fd}, \text{db}, \text{db}, \text{bb} \}$$

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LISTA-1-FEXERCICIO-3-LETRA-J FEITO CERTO DEPOIS

LISTA_1 - EXERCICIO - 4 - LETRA - a

$$\Sigma_1^2 : \{ H_2H_2, H_2F_0, F_0F_0, F_0H_2 \}$$

LISTA-1-EXERCICIO-4-LETRA-b

$$\Sigma_1^{\circ} \cup \Sigma_2^{\circ} = \{H_2H_2, H_2Fe, FeF_1, FeH_2, SO_4SO_4, SO_4O_2, SO_4Cl_2, O_2SO_4, O_2O_2, O_2Cl_2, Cl_2SO_4, Cl_2O_2, Cl_2Cl_2\}$$

LETRA - I - EXERCICIO - 4 - LETRA - C

$$\sum_{\text{I}}^1 \sum_{\text{II}}^1 = \{ \text{H}_2\text{SO}_4, \text{H}_2\text{O}_2, \text{HCl}_2, \text{FeSO}_4, \text{FeO}_2, \text{FeCl}_2 \}$$

LISTA - 1 - EXERCÍCIO - 3 - LETRA - J

LISTA - 1 - EXERCICIO - 3 - LETRA - b

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LISTA-2-EXERCICIO-1-LETRA-a
 $a(a, b, c)^*$

LISTA-2-EXERCICIO-1-LETRA-b
 $(b^*ab^*ab^*)^*$

LISTA-2-EXERCICIO-1-LETRA-c
 $(0,1)^* \cdot 100$

LISTA-2-EXERCICIO-1-LETRA-d
 $(1[01]^* | 0[01]^+) [01]^*$

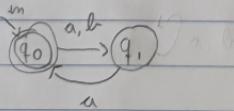
LISTA-2-EXERCICIO-2-LETRA-a

Conta os números binários de 0000 a 1111

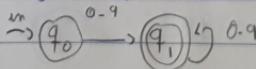
LISTA-2-EXERCICIO-2-LETRA-b

Conta cadeias que apresentam pelo menos 1 "a" e crescem de 5 em 5

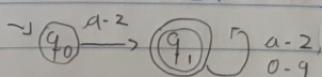
LISTA-2-EXERCICIO-3-LETRA-a



LISTA-2-EXERCICIO-3-LETRA-b

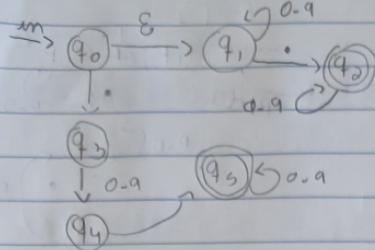


LISTA-2-EXERCICIO-3-LETRA-c

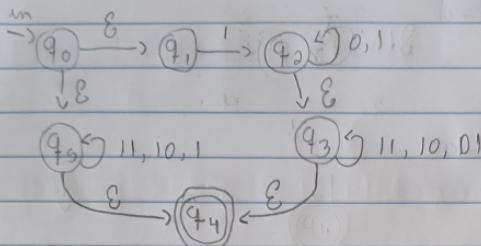


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LISTA_2_EXERCICIO_3_LETRA_d



LISTA_2_EXERCICIO_3_LETRA_e



LISTA_2_EXERCICIO_4_LETRA_a

if

LISTA_2_EXERCICIO_4_LETRA_b

$[a-z][a-z0-9]^*$

LISTA_2_EXERCICIO_4_LETRA_c

$[0-9][0-9]^*$

LISTA_2_EXERCICIO_4_LETRA_d

$([0-9]^+ \cup [0-9]^*) \mid ([0-9]^* \cup [0-9]^+)$

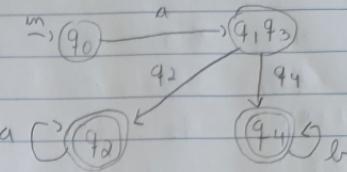
LISTA_2_EXERCICIO_4_LETRA_e

tilibra $((\dots([a-z] \mid "m") \mid ("^")^*)$

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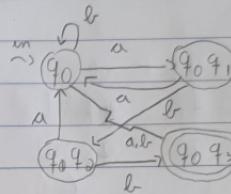
LISTA_3_EXERCICIO_1 - LETRA - a

Q	a	b
q_0	q_1 q_3	∅
q_1 q_3	q_2	q_4
q_2	q_2	∅
q_4	∅	q_4



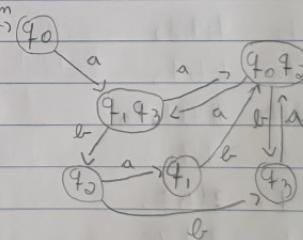
LISTA_3_EXERCICIO_1 - LETRA - b

Q	a	b
q_0	q_0 q_1	q_0
q_0 q_1	q_0	q_0 q_2
q_0 q_2	q_0	q_0 q_3
q_0 q_3	q_0	q_0



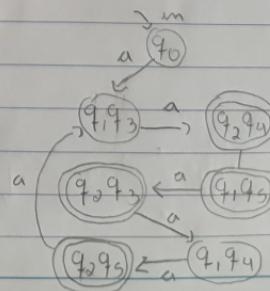
LISTA_3_EXERCICIO_1 - LETRA - c

Q	a	b
q_0	q_1 q_3	∅
q_1 q_3	q_0 q_2	q_2
q_0 q_2	q_1 q_3	q_3
q_2	q_1	q_3
q_3	q_0 q_2	∅
q_1	∅	q_0 q_2



LISTA_3_EXERCICIO_1 - LETRA - d

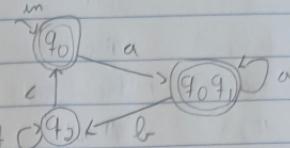
Q	a	Q	a
q_0	q_1 q_3	q_0 q_5	q_1 q_3
q_1 q_3	q_2 q_4		
q_2 q_4	q_1 q_5		
q_1 q_5	q_2 q_3		
q_2 q_3	q_1 q_4		
q_1 q_4	q_0 q_5		



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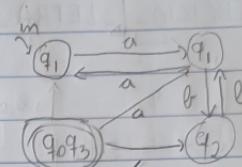
LISTA_3-EXERCICIO_1-LETRA_e

Q	a	b	c
q_0	q_0 q_1	Ø	Ø
q_0 q_1	q_0 q_1	q_2	Ø
q_2	Ø	q_2	q_0



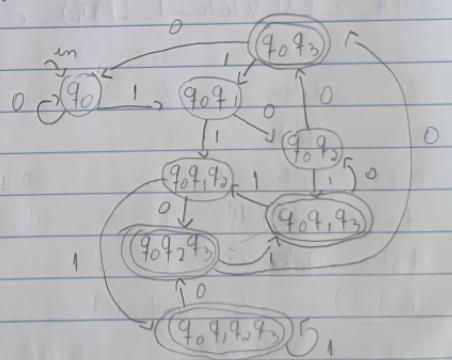
LISTA_3-EXERCICIO_1-LETRA_f

Q	a	b	c
q_0	q_1	Ø	Ø
q_1	q_0	q_2	Ø
q_2	Ø	q_1	q_0 q_3
q_0 q_3	q_1	Ø	q_2



LISTA_3-EXERCICIO_1-LETRA_g

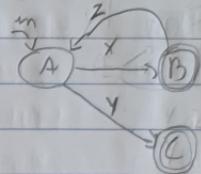
Q	0	1
q_0	q_0	q_0 q_1
q_0 q_1	q_0 q_2	q_0 q_1 q_2
q_0 q_2	q_0 q_3	q_0 q_1 q_3
q_0 q_1 q_2	q_0 q_2 q_3	q_0 q_1 q_2 q_3
q_0 q_3	q_0	q_0 q_1
q_0 q_2 q_3	q_0 q_3	q_0 q_1 q_3
q_0 q_1 q_3	q_0 q_2	q_0 q_1 q_2
q_0 q_1 q_2 q_3	q_0 q_2 q_3	q_0 q_1 q_2 q_3



Marcos Dulcine Alves de Barros

LISTA - 3 - EXERCICIO - 2 - LETRA - a

	Q	X	Y	Z
Ⓐ	1234	567	67	∅
Ⓑ	(567)	∅	∅	1234
Ⓒ	(67)	9	∅	∅



LISTA - 3 - EXERCICIO - 2 - LETRA - b

	Q	a	b	Q	a	b
1	1.2	1		12346 ^F	1235	135
12	1.2.3	13		146 ^F	125	15
13	124	14		1236 ^F	1234	134
123	1234	134		136 ^F	124	14
1.24	1235	135		126 ^F	123	13
14	1.25	15		16 ^F	12	1
134	1245	145		12356 ^F	12346	1346
1.234	1.2345	1345		1356 ^F	1246	146
1235	12346	1346		1256 ^F	1236	136
135	1246	146		156 ^F	126	16
125	1236	136		123456 ^F	123456	13456
15	126	16		13456 ^F	12456	1456
1245	12356	1356		12456 ^F	12356	1356
145	1256	156		1456 ^F	1256	156
12345	123456	13456		12345	123456	13456
1345	12456	1456				
12346 ^F	12345	1345				
1346 ^F	1245	145				

Marco Lílio Alves de Barros

LISTA - 3 - EXERCICIO - 2 - LETRA - C

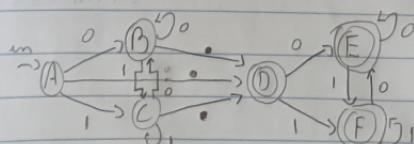
	Q	C	S	t	n	P	
A	1.5.10.14	26/11/15	0	0	0	0	(A)
B	5.26/11/15	0	3.7/12/16	0	0	0	(B)
C	3.7/12/16	0	0	48	13/7	0	(C)
D	4.8	0	0	17/0	0	9	(D)
E	13/7	0	0	0	0	18	t (E)
F.G	9.0.18	0	0	0	0	0	(F) S (G) S

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LISTA_3_EXERCICIO_2 - LETRA_d

	<u>Q</u>	<u>a</u>	<u>m</u>
A	0.1.3 F	1.3.2.4	(A) \xrightarrow{a} (B)
B	1.3.2.4 F	2.4.1.5	(a) \nearrow (a) \searrow
C	2.4.1.5 F	1.5.2.3	(D) \xrightarrow{a} (C)
D	1.5.2.3 F	2.3.1.4	

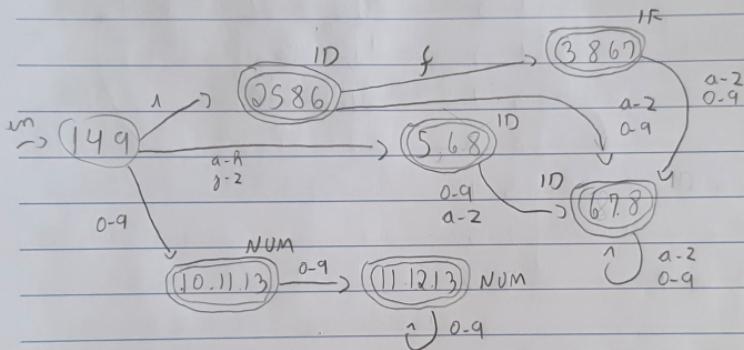
LISTA-3_EXERCICIO-2-LETRA-e



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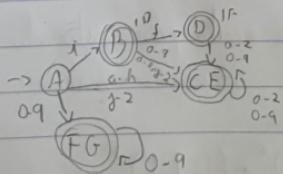
LISTA_3 - EXERCICIO_3

Q	i	f	[a-z]	[0-9]	IF = 3
1.4.9	2586	-	S, 8, 6	10, 13, 11	NUM = 13
25.86	-	38.6.7	8.6.7	8.6.7	ID = 8
5.8.6	-	-	8.6.7	8.6.7	
10.13.11	-	-	Ø	13, 11, 12	
3.8.6.7	-	-	6.7.8	6.7.8	
6.7.8	-	-	7.8.6	7.8.6	
13.11.12	-	-	Ø	12, 13, 11	



LISTA_4 - EXERCICIO_1 - LETRA_a

		a-z	0-9	i	f
B	X	A	C	F	B
C	X X	B	E	E	D
D	X X	C	E	E	-
E	X X D	D	E	E	-
F	X X X X X	E	E	E	-
G	X X X X X D	F	Ø	G	-
H	I B C D E F	G	Ø	G	-



Marco Sérgio Alves da Barros

LISTA - 4 - EXERCICIO - 1 - LETRA - b

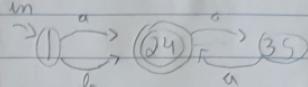
2 X 1 2 4

3 X 0 2 3 0

4 X 0 0 3 2 0

5 X 0 0 0 4 5 0

1 2 3 4 5 4 0



LISTA - 4 - EXERCICIO - 1 - LETRA - f

2 X 1 2 6

3 X X 2 7 3

4 X X X 1 3 1 3

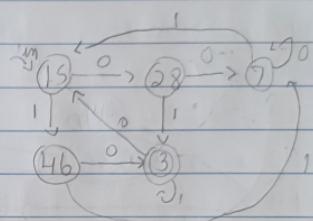
5 0 Y X X 4 3 7

6 X Y X 0 X 5 8 6

7 Y X X X X X 6 3 7

8 X 0 X X X X X 7 7 5

1 2 3 4 5 6 7 8 7 3



LISTA - 4 - EXERCICIO - 2 - LETRA - a

A Q 1 . B A

A 12348 234678^B 34578^C 910111216^D C 0 0

B 234678 234678^B 234578^C 910111216^D D X X X

C 234578 234678 234578^C 910111216^D E X X X 0

D 910111216 101112141516 101112131516^E 0 F X X X A 0

E 101112141516 101112141516^E 101112131516^F 0 A B C D E

F 101112131516 101112141516^E 101112131516^F 0 ?

A B C 0 1 .

A B C A B C A B C

D E F D E F D E F

D E F D E F D E F

D E F D E F D E F

A linguagem aceita pelo automata
é a de numeros binários
fracionários

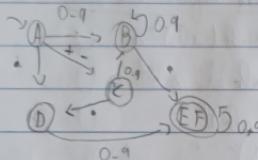
$$ER : (011)^* \cdot (011)^*$$

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LISTA - 4 - EXERCÍCIO - 2 - LETRA - b

	Q	0-9	+	-	*	B X
A	O I	14 ^B	1 ^C	1 ^C	2 ^D	C X X
B	14	14 ^B	0	0	235 ^E	D X X X
C	I	14 ^B	0	0	2 ^D	E X X X /
D	2	35 ^F	0	0	0	F X X X > D
E	235 ^G	35 ^H	0	0	0	A B C D E
F	35 ^I	35 ^J	0	0	0	E F D E D

	Q	0-9	+	-	*	
A	B	C	<	D		
B	B	B	0	0	E F	
C	B	B	0	0	D	
D	E F	0	*	3		
E	E F	0	0	0		
F	0	0	0	0		



A linguagem aceita pelo autômato é de números reais, com ou sem sinal
 $ER: (+|-) \cdot ([0-9]^+ \cdot [0-9])^* \cdot [0-9]^*$

LISTA - 4 - EXERCÍCIO - 3

A: 0 16 17 18

Q a b

B: 1 2 19 20

A p B

C: 0 3 17 18 21 22 14 8 15 23 10 4 11 12 6 13

B c D

D: 8 9 15 23 5 4 11 12 6 13

C d E

E: 1 2 19 20 6 7 13 23

D f F

F: 6 7 13 23

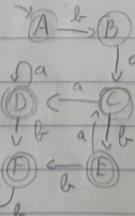
E g C

F h D

B Y

C X X

D X X D



E > X D D

F X X X X D

A B C D E

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$$A = \{0, 10, 11, 4\}$$

CONTINUAÇÃO 14 E3

a b

A Ø B

B C Ø

C D E

D * D F

E * C F

F * Ø F

B *

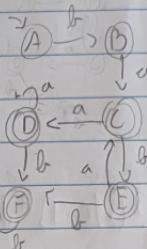
C *

D X X Y

E X X X X

F X X X X X

A B C D E



∴ São Equivalentes

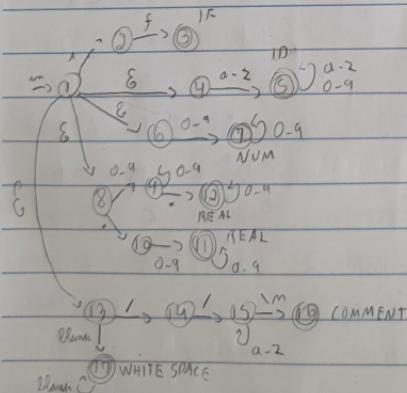
bab + bab(ab)*a U

bab(ab)a*a* U

bab(ab)* U

(bab(ab)*aa*)b + bab(ab)*b*

LISTA_4-EXERCICIO_4- LETRA_a.



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LISTA_4 - EXERCICIO_4 - LETRA_b

Q	a-z	0-9	.	/	\m	^	x	t
A	1 4 6 8 13	5	7 9	10	14	0	17	0
B	5 F	5	5	0	0	0	0	-
C	7 9 F	0	7 9	10	0	0	0	-
D	10	0	11	0	0	0	0	-
E	14	0	0	0	15	0	0	-
F	17 F	0	0	0	0	0	17	-
G	0	0	0	0	0	0	0	- 3 F
H	12 F	0	12	0	0	0	0	-
I	11 F	0	11	0	0	0	0	-
J	15	15	0	0	0	16	0	-
K	16 F	0	0	0	0	0	0	-
L	3 F	0	0	0	0	0	0	-

B x

C y k

D x x x

E x x x

F y x x

G x x x x

H x y y y x

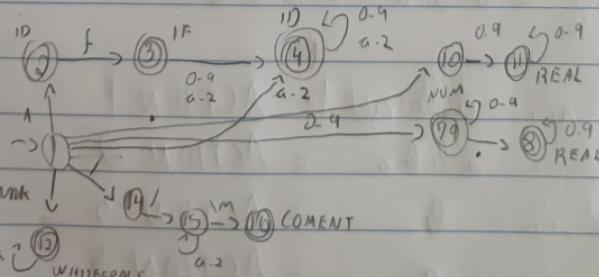
I x x x x x

J x y y y x

K x x x x x x

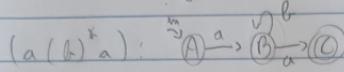
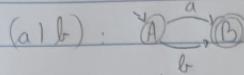
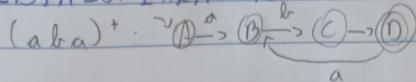
L x y y x x x x

A B C D E F G H I J K

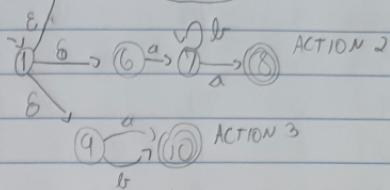


Maria Lúcia Alves de Barros

LISTA - 5 - EXERCÍCIO - 3



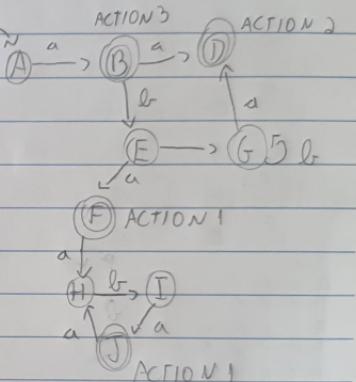
Automato combinado AFND - 8
ACTION 1



AEND \rightarrow AFD

	Q	a	b	
(A)	12.69	3.710	1.0	
(B)	3.710 F	8	4.7	ACTION 3
(C)	1.0 F	Ø	Ø	ACTION 2
(D)	8 F	Ø	Ø	ACTION 2
(E)	4.7	5.8	7	
(F)	5.8 F	3	Ø	ACTION 1
(G)	7	8	7	
(H)	3	Ø	4	
(I)	4	5	Ø	
(J)	5 F	3	Ø	ACTION 1

Automato combinado = conversor



Teste e classificação da string a b a a b b a b a

$A \xrightarrow{a} B \xrightarrow{b} E \xrightarrow{c} F$ (also called ACTION)

$$A \xrightarrow{a} B \xrightarrow{b} E \xrightarrow{c} G \xrightarrow{d} D \quad \therefore abcd = ACTION$$