

## LISTA - L

LISTA - L - EXERCICIO - L - LETRA - a

$$\{ab, c\}^* = \{\lambda, ab, c, abab, abc, cba, cc, ababab \dots\}$$

LISTA - L - EXERCICIO - L - LETRA - b

$$\{a, b, c\}^+ = \{a, b, c, aa, ab, ac, bb, ba, bc, cc, ca, cb, abc \dots\}$$

LISTA - L - EXERCICIO - L - LETRA - c

$$\{abc\}^* = \{\lambda, abc, abcabc, abcabcabc, abcabcabcabc \dots\}$$

LISTA - L - EXERCICIO - 2 - LETRA - a

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

LISTA - L - EXERCICIO - 2 - LETRA - b

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

LISTA - L - EXERCICIO - 2 - LETRA - c

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

LISTA - L - EXERCICIO - 2 - LETRA - d

$$\{Ana\bar{b}, Ema\bar{m}\bar{a}, Gab\bar{i}\bar{r}, Isab, Ra\bar{f}\bar{a}\} \cdot \{da\} = \{Anabola, Emanuela, Gabriela, Isabela, Rafaela\}$$

LISTA - L - EXERCICIO - 3 - LETRA - a

$$\Sigma^2 = \{\text{d}\text{d}, \text{d}\text{d}, \text{d}\text{d}, \text{dd}, \text{dd}, \text{d}\text{d}, \text{d}\text{d}, \text{d}\text{d}, \text{d}\text{d}\}$$

Suzilene Henrique Gonçalves Sílva

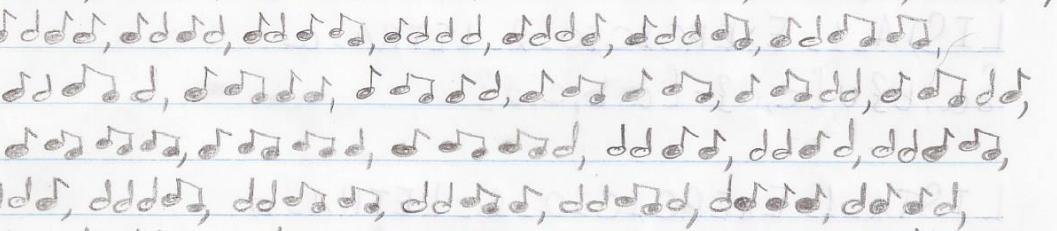
# LISTA\_1 EXERCICIO\_3 LETRA\_b

$$\sum^3 = \{ \text{notes and rests} \}$$

## LISTA\_1\_EXERCICIO\_3\_- LETRA - c

$$\Sigma^2 \cup \Sigma^2 = \{ \text{d} \uparrow \text{d}, \text{d} \downarrow \text{d}, \text{d} \uparrow \text{d}, \text{d} \downarrow \text{d} \}$$

## LISTA\_1 EXERCICIO\_3 LETRA\_d

$\sum^2 \cdot \sum^2 = \{$    $\}$



## LISTA\_1\_ EXERCICIO\_3\_ LETRA \_de

$\Sigma^2 \cdot \Sigma^3 = \{ \text{various musical note patterns} \}$

The text contains a large number of handwritten musical note patterns, likely representing a set of exercises for letter recognition. The patterns include various note heads (circles, diamonds, etc.) and stems, some with vertical lines and some with diagonal strokes. The patterns are organized into several groups separated by short horizontal lines.

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Gustavo Henrique Gonçalves Sá

Handwritten musical notation consisting of a series of notes and rests on five-line staff paper.

LISTA\_1\_EXERCICIO\_4 LETRA\_a

$$\Sigma_1^2 = \{ H_2H_2, H_2Fe, FeH_2, FeFe \}$$

LISTA\_1\_EXERCICIO\_4 LETRA\_b

$$\Sigma_1^1 \cup \Sigma_2^2 = \{ H_2, Fe, SO_4, O_2, Cl_2 \}$$

LISTA\_1\_EXERCICIO\_4 LETRA\_c

$$\Sigma_1^1 \cdot \Sigma_2^1 = \{ H_2SO_4, H_2O_2, H_2Cl_2, FeSO_4, FeO_2, FeCl_2 \}$$



Guilherme Antunes Gonçalves S. I. C.

## LISTA\_2

LISTA\_2 EXERCICIO\_1 - LETRA\_a  
 $c^* [abc] b [abc]^* ]^*$

LISTA\_2 EXERCICIO\_1 - LETRA\_b  
 $(c^* a [abc]^* b [abc]^*) | c^*$

LISTA\_2 EXERCICIO\_1 - LETRA\_c  
 $((011)^*)^*$

LISTA\_2 EXERCICIO\_1 - LETRA\_d  
 $((110)^* 1 ((110)^* (110)(110)(110)(110)(110)) |$   
 $((110)^* 1 ((110) 1 (110) 1 1)$   
 $((110)^* 1 ((110) 1 1 (110) 1)$   
 $((110)^* 1 1 ((110)(110) 1$

## LISTA\_2 EXERCICIO\_2 - LETRA\_a

Números binários de 4 dígitos diferentes de zero

## LISTA\_2 EXERCICIO\_2 - LETRA\_b

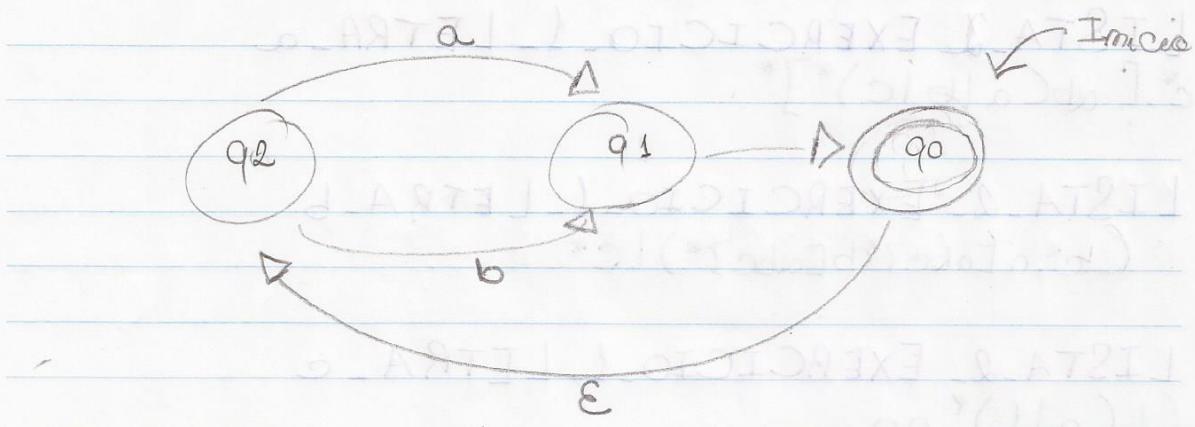
Cadeias de "a" de tamanho 5 somado à múltiplos de 5 (incluído 0).

Gustavo Henrique Gonçalves Silva  
Guilherme Silva

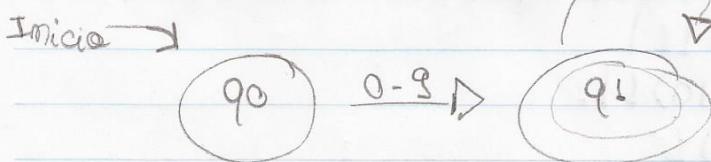
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1 - 1

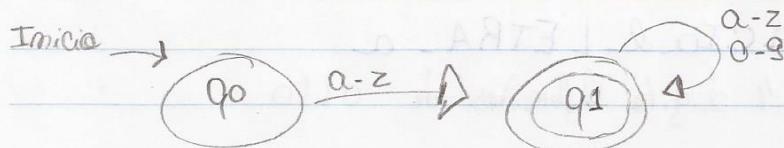
## LISTA\_2\_EXERCICIO\_3.LETRA\_a (a|b)\*



## LISTA\_2\_EXERCICIO\_3.LETRA\_b [0-9]\*

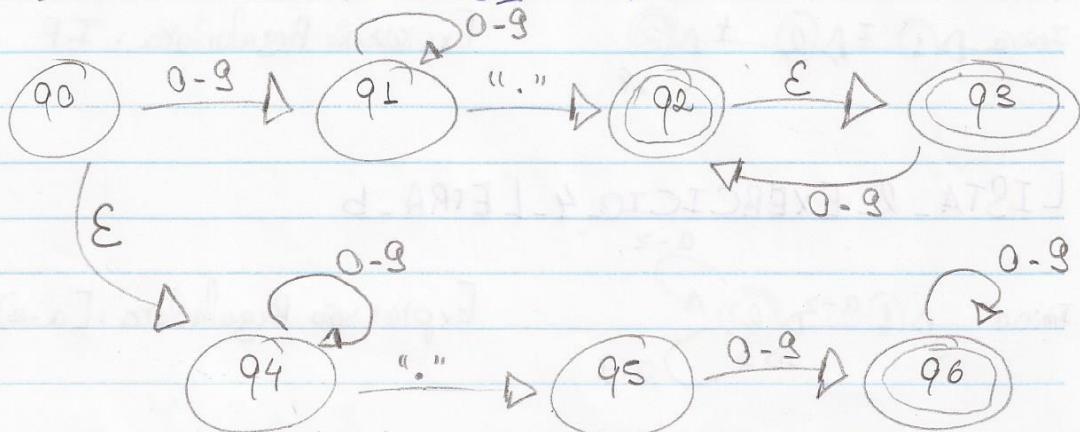


## LISTA\_2\_EXERCICIO\_3.LETRA\_c [a-z][a-z0-9]\*



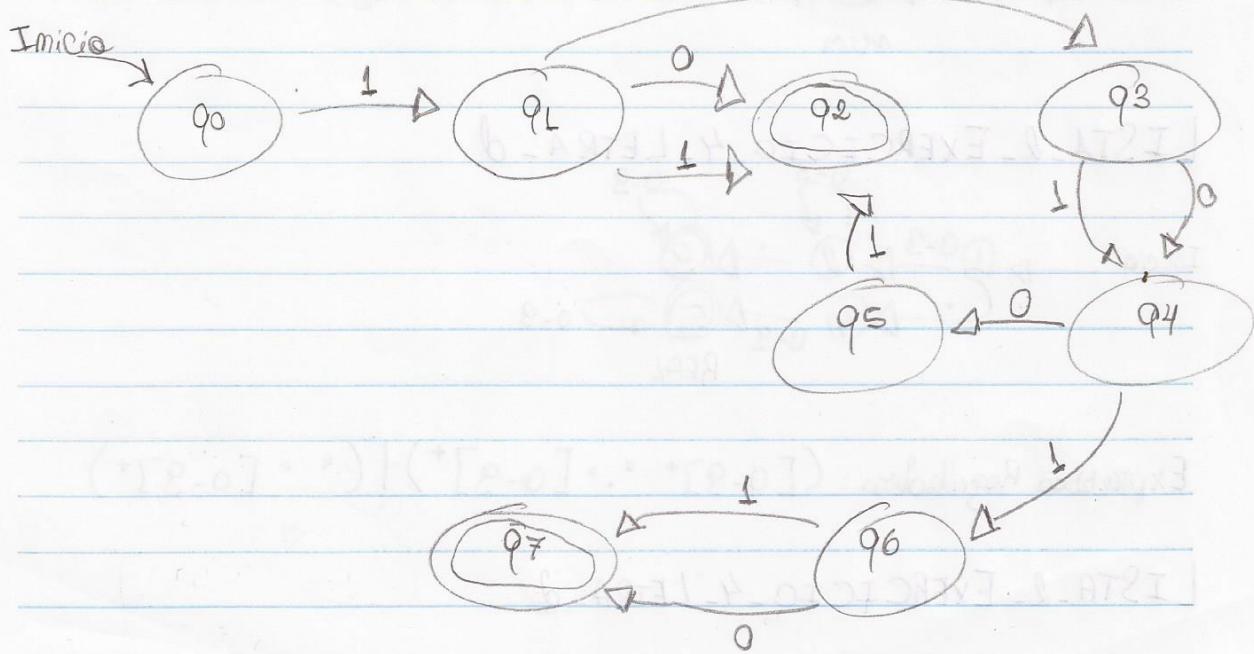
LISTA\_2\_EXERCICIO\_3-LETRA\_d

$([0-9]^+ \cdot \cdot [0-9]^*) | ([0-9]^* \cdot \cdot [0-9]^+)$



LISTA\_2\_EXERCICIO\_3-LETRA\_e

$(\perp (011)^* (1110101)) | (111011)$



Guilherme Henrique Gonçalves Sforza

Guilherme Sforza

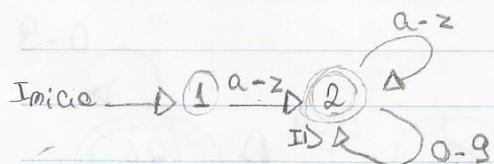
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## LISTA\_2 - EXERCICIO\_4 - LETRA\_a



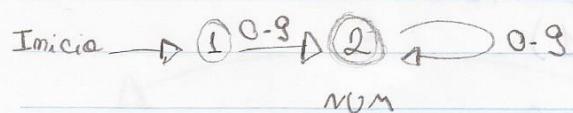
Expressão Reguladora: IF

## LISTA\_2 - EXERCICIO\_4 - LETRA\_b



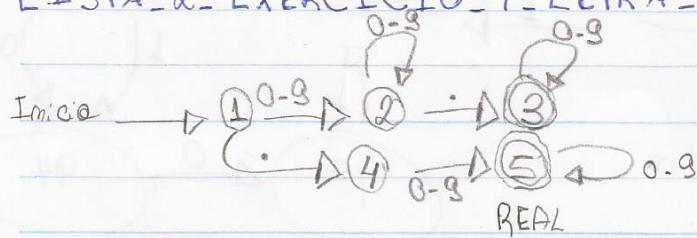
Expressão Reguladora: [a-z][a-z0-9]\*

## LISTA\_2 - EXERCICIO\_4 - LETRA\_c



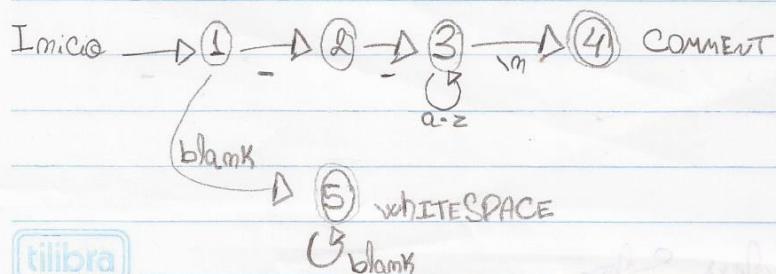
Expressão Reguladora: [0-9]\*

## LISTA\_2 - EXERCICIO\_4 - LETRA\_d



Expressão Reguladora: ([0-9]+ ".") [0-9] + ) | ( ". " [0-9] + )

## LISTA\_2 - EXERCICIO\_4 - LETRA\_e



Suárez Henrique

Souza S. Silveira

Suárez S. Silveira

Expressão Reguladora: ("--" [a-z] + "\n") | (" " | "\n" | "")<sup>+</sup>

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## LISTA\_3

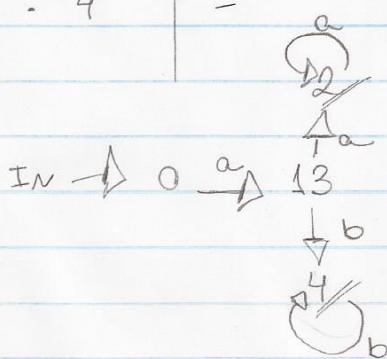
## LISTA\_3\_EXERCICIO\_(- LETRA\_a)

	a	b
$\rightarrow 0$	13	-
13	2	4
- 2	2	-
- 4	-	4

LEGENDA:

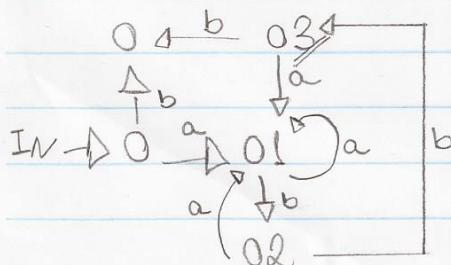
IN: Inicio

= Estado Final



## LISTA\_3\_EXERCICIO\_(- LETRA\_b)

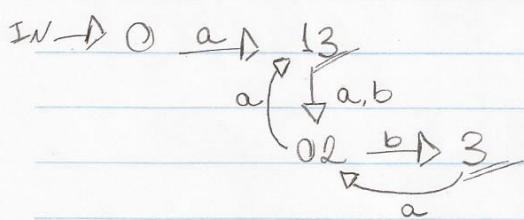
	a	b
$\rightarrow 0$	01	0
01	01	02
02	01	03
- 03	01	0



Guilherme Henrique Gangalva S. da Cunha

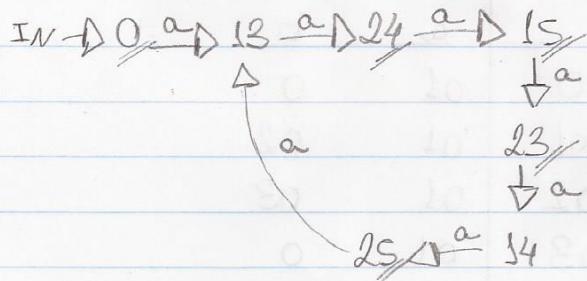
LISTA\_3\_EXERCICIO\_1-LETRA\_C AT25

	a	b
→ 0	13	-
- 13	02	02
02	13	3
- 3	02	-



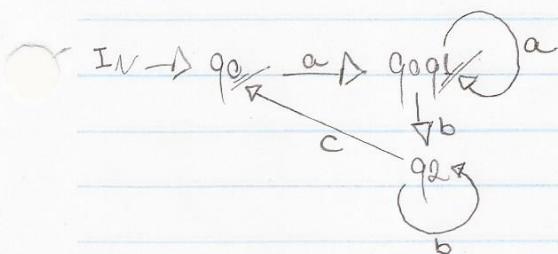
LISTA\_3\_EXERCICIO\_1-LETRA\_d

	a
→ 0	13
13	24
- 24	15
- 15	23
- 23	14
- 14	25
- 25	13



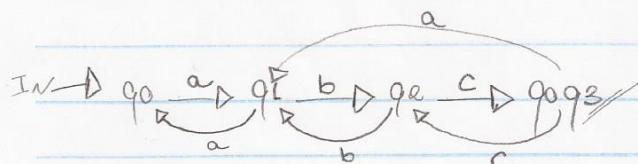
LISTA\_3. EXERCICIO\_1. LETRA\_e

	a	b	c
-> q0	q0q1	-	-
-q0q1	q0q1	q2	-
q2	-	q2	q0



LISTA\_3. EXERCICIO\_1. LETRA\_f

	a	b	c
-> q0	q1	-	-
q1	q0	q2	-
q2	-	q1	q0q3
- q0q3	q1	-	q2

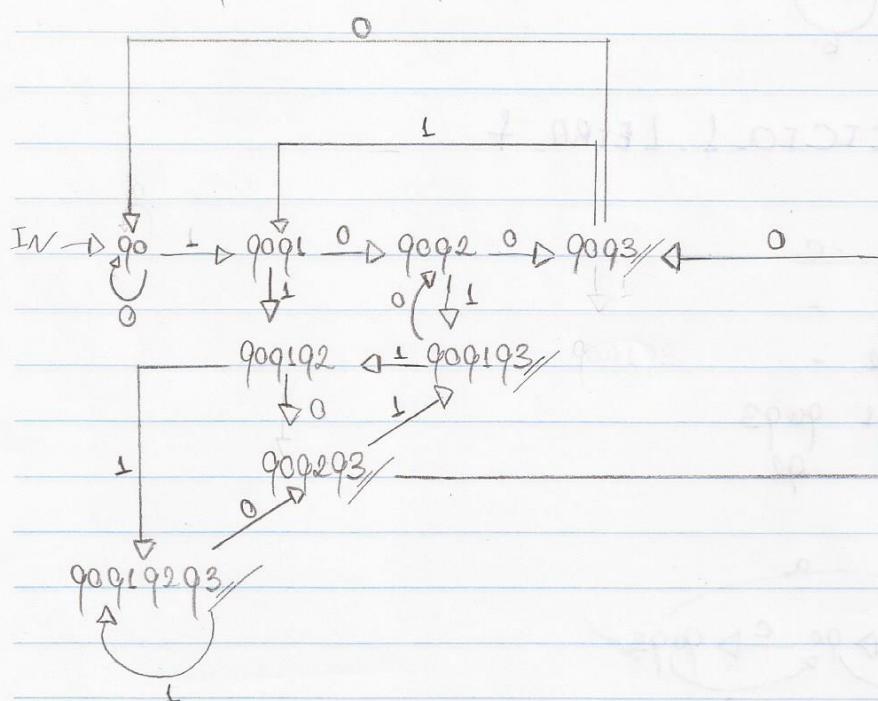


Guthorme Henrique Gonçalves Silveira

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### LISTA\_3\_EXERCICIO\_1 LETRA\_g

	0	1
-> q0	q0	q0q1
q0q1	q0q2	q0q1q2
q0q2	q0q3	q0q1q3
- q0q3	q0	q0q1
q0q1q2	q0q2q3	q0q1q2q3
- q0q1q3	q0q2	q0q1q2
- q0q2q3	q0q3	q0q1q3
- q0q1q2q3	q0q2q3	q0q1q2q3



### LISTA\_3\_EXERCICIO\_2 LETRA\_a

	x	y	z
-> 1,2,3,4	5,6,7	6,7	-
- 5,6,7	-	-	1,2,3,4
- 6,7	-	-	-

IN -> 1,2,3,4  $\times \rightarrow 5,6,7$   
y  
6,7

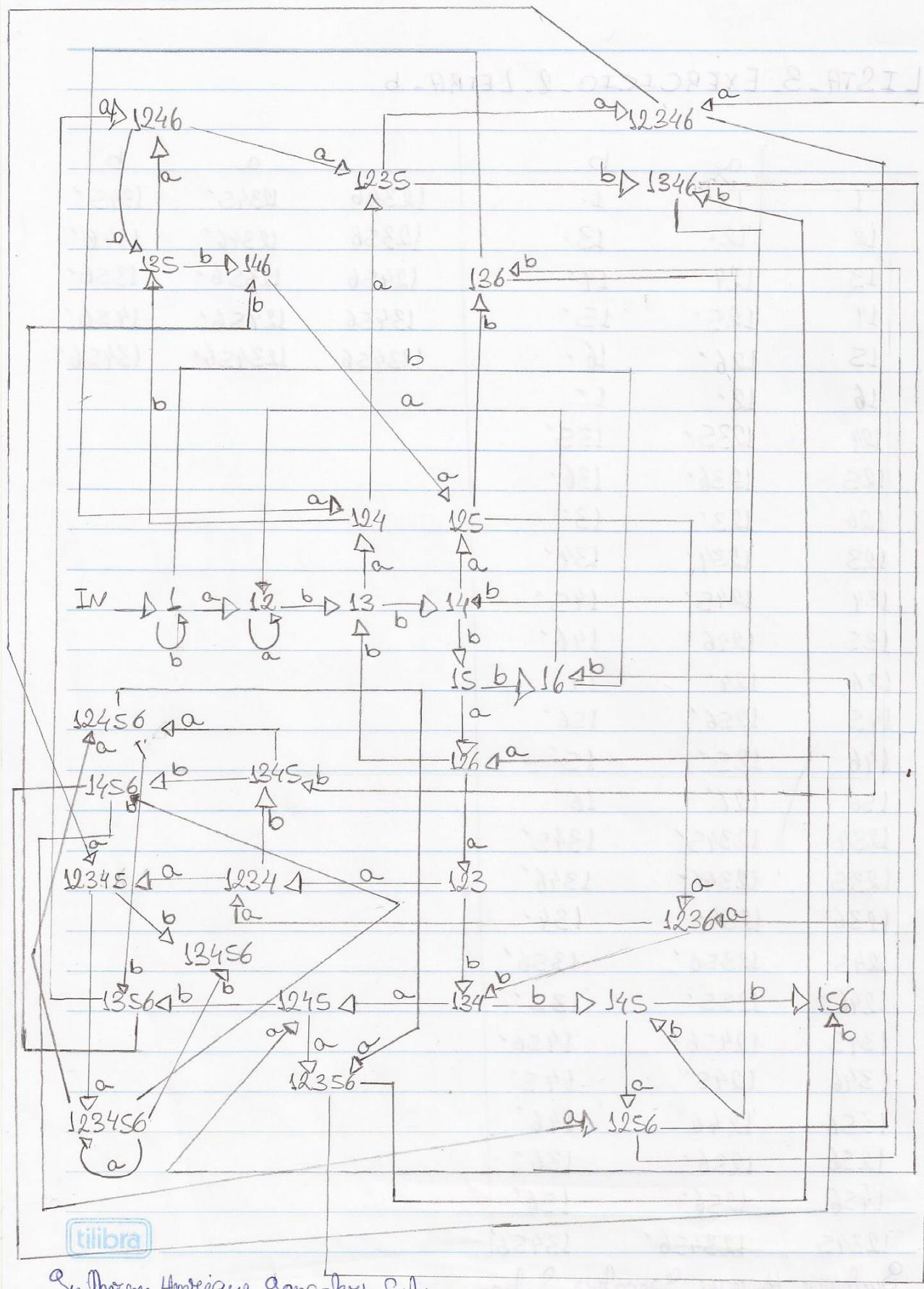
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LISTA\_3\_EXERCICIO\_2.LETRA\_b

	a	b		a	b
1	12·	1·	12346	12345·	1345·
12	12·	13·	12356	12346·	1346·
13	124·	14·	12456	12356·	1356·
14	125·	15·	13456	12456·	1456·
15	126·	16·	123456	123456·	13456·
16	12·	1·			
124	1235·	135·			
125	1236·	136·			
126	123·	13·			
123	1234·	134·			
134	1245·	145·			
135	1246·	146·			
136	124·	14·			
145	1256·	156·			
146	125·	15·			
156	126·	16·			
1234	12345·	1345·			
1235	12346·	1346·			
1236	1234·	134·			
1245	12356·	1356·			
1246	1235·	135·			
1345	12456·	1456·			
1346	1245·	145·			
1356	1246·	146·			
1256	1236·	136·			
1456	1256·	156·			
12345	123456·	13456·			

Sergio Henrique Gonçalves S. J.

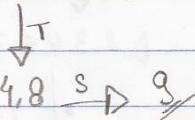




### LISTA\_3 EXERCICIO\_1 - LETRA\_C

	a	c	r	s	t
→ 1,5,10,14	-	2,6,11,15	-	-	-
2,6,11,15	3,7,12,16	-	-	-	-
3,7,12,16	-	-	13,17	-	4,8
- 13,17	-	-	-	18	-
- 4,8	-	-	-	9	-
- 18	-	-	-	-	-
- 9	-	-	-	-	-

IN → 1,5,10,14 → 2,6,11,15 → 3,7,12,16 → 13,17 → 18,



### LISTA\_3 - EXERCICIO\_2 - LETRA\_D

	a
IN - 0,1,3	2,4
2,4	1,5
- 1,5	2,3
- 2,3	1,4
- 1,4	2,5
2,5	1,3
- 1,3	2,4

IN → 0,1,3 → 2,4

↓ a

1,5

↓ a

2,3

↓ a

1,4

↓ a

2,5

↓ a

1,3

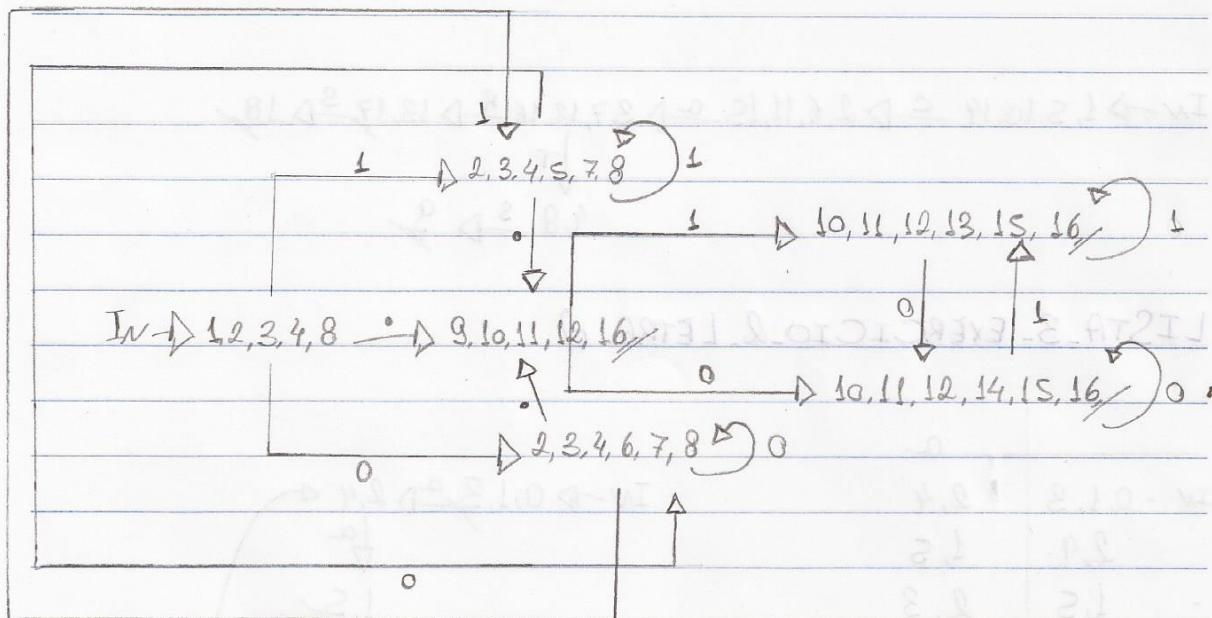
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LISTA 3. EXERCÍCIO 2 LETRA c

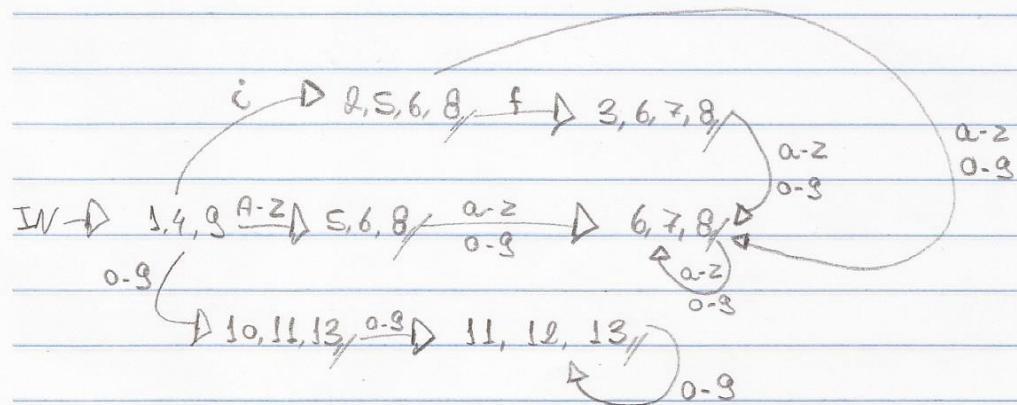
	1	0	.
IN	1,2,3,4,8 2,3,4,5,7,8	2,3,4,6,7,8 2,3,4,5,7,8	9,10,11,12,16 9,10,11,12,16
	2,3,4,5,7,8 2,3,4,5,7,8	2,3,4,6,7,8 2,3,4,5,7,8	9,10,11,12,16 9,10,11,12,16
	2,3,4,6,7,8 2,3,4,5,7,8	2,3,4,6,7,8 2,3,4,5,7,8	9,10,11,12,16 9,10,11,12,16
-	9,10,11,12,16 10,11,12,13,15,16	10,11,12,13,15,16 10,11,12,13,15,16	-
-	10,11,12,13,15,16 10,11,12,13,15,16	10,11,12,13,15,16 10,11,12,13,15,16	-
-	10,11,12,13,15,16 10,11,12,13,15,16	10,11,12,13,15,16 10,11,12,13,15,16	-





### LISTA 3 - EXERCICIO 3 - LETRA a

	i	f	a-z	0-9
IN 1,4,9	2,5,6,8'	5,6,8'	2,5,6,8'	10,11,13'
- 2,5,6,8	6,7,8'	3,6,7,8'	3,6,7,8'	6,7,8'
- 5,6,8	6,7,8'	6,7,8'	6,7,8'	6,7,8'
- 10,11,13	-	-	-	11,12,13
- 6,7,8	6,7,8'	6,7,8'	6,7,8'	6,7,8'
- 3,6,7,8	6,7,8'	6,7,8'	6,7,8'	6,7,8'
- 11,12,13	-	-	-	11,12,13



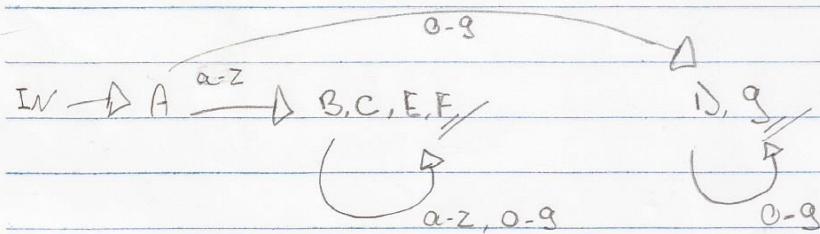
Suárez Henrique Gonçalves Silva



## LISTA 4. EXERCICIO 1 - LETRA A

	i	F	<del>a-e, a-h, s-z</del>	O-9
IN-A - 1,4,9	B	C	C	D
- B - 2,5,6,8	F	E	F	F
- C - 5,6,8	F	F	F	F
- D - 6,11,13	-	-	-	g
- E - 3,6,7,8	F	F	F	F
- F - 6,7,8	F	F	F	F
- g - 11,12,13	-	-	-	g

B	x					
C	x	x				
D	x	x	x			
E	x	x		x		
F	x	x		x		
G	x	x	x		x	x
	A	B	C	D	E	F



Silvana Henrique Gonçalves Silva



## LISTA - 4. EXERCICIO 1. LETRA b

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
IN -> 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
- 2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
- 4	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

2	x																								
3	x	x																							
4	x		x		x																				
5	x	x	x	x																					
	1	2	3	4																					

IN -> 1  $\xrightarrow{a,b}$  2,4  $\xrightarrow{a}$  3,5  $\xrightarrow{b}$

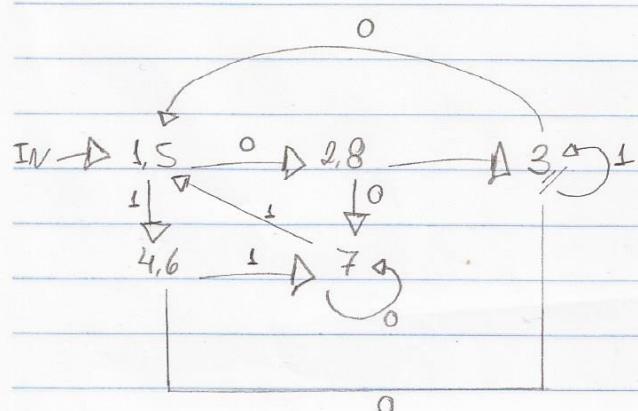


Suillusverne Henrique Gonçalves S. de

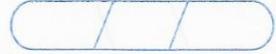
## LISTA\_4 EXERCICIO LÉTРА C

	0	1
IN → 1	2	6
2	7	3
- 3	1	3
4	3	7
5	8	6
6	3	7
7	7	5
8	7	3

2	X						
3	X	X					
4	X	X	X				
5		X	X	X			
6	X	X	X		X		
7	X	X	X	X	X	X	
8	X		X	X	X	X	
	1	2	3	4	5	6	7



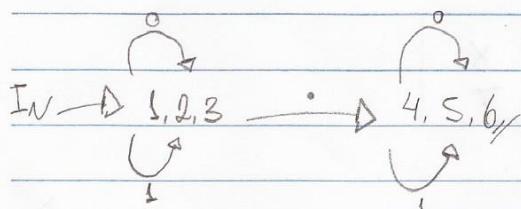
Guilherme Henrique Gangales SImo



LISTA\_4\_EXERCICIO\_2 LETRA\_a

	L	O	.
IN → 1, 2, 3, 4, 8	① 2, 3, 4, 6, 7, 8	② 2, 3, 4, 6, 7, 8	③ 9, 10, 11, 12, 16
2, 3, 4, 5, 7, 8	④ 2, 3, 4, 5, 7, 8	⑤ 2, 3, 4, 6, 7, 8	⑥ 9, 10, 11, 12, 16
2, 3, 4, 6, 7, 8	⑦ 2, 3, 4, 5, 7, 8	⑧ 2, 3, 4, 6, 7, 8	⑨ 9, 10, 11, 12, 16
- 9, 10, 11, 12, 16	⑩ 10, 11, 12, 13, 15, 16	⑪ 10, 11, 12, 14, 15, 16	-
- 10, 11, 12, 13, 15, 16	⑫ 10, 11, 12, 13, 15, 16	⑬ 10, 11, 12, 14, 15, 16	-
- 10, 11, 12, 14, 15, 16	⑭ 10, 11, 12, 13, 15, 16	⑮ 10, 11, 12, 14, 15, 16	-

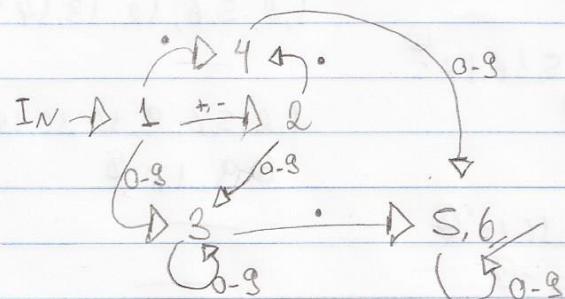
2				
3				
4	x	x	x	
5	x	x	x	
6	x	x	x	
	1	2	3	4
			5	



LISTA\_4\_EXERCICIO\_2\_LETRA\_b

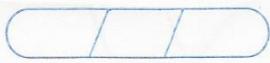
	t -	0 - 9	
IN → q <sub>0</sub> q <sub>1</sub> <sup>①</sup>	q <sub>1</sub> '	q <sub>1</sub> q <sub>4</sub> '	q <sub>2</sub> '
q <sub>1</sub> <sup>②</sup>	-	q <sub>1</sub> q <sub>4</sub> '	q <sub>2</sub> '
q <sub>1</sub> q <sub>4</sub> <sup>③</sup>	-	q <sub>1</sub> q <sub>4</sub> '	q <sub>2</sub> q <sub>3</sub> q <sub>5</sub>
q <sub>2</sub> <sup>④</sup>	-	q <sub>3</sub> q <sub>5</sub>	-
q <sub>2</sub> q <sub>3</sub> q <sub>5</sub> <sup>⑤</sup>	-	q <sub>3</sub> q <sub>5</sub>	-
q <sub>3</sub> q <sub>5</sub> <sup>⑥</sup>	-	q <sub>3</sub> q <sub>5</sub>	-
q <sub>3</sub> q <sub>5</sub>	-	q <sub>3</sub> q <sub>5</sub>	-

2	x					
3	x	x				
4	x	x	x			
5	x	x	x	x		
6	x	x	x	x	x	
1	2	3	4	5	6	



Gustavo Henrique Gonçalves Silveira

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## LISTA 4 - EXERCICIO 3

	a	b
Int 16, 0, 17, 18	—	1, 2, 18, 20
1, 2, 19, 20	0, 3, 4, 6, 8, 10, 11, 12, 13, 14, 15, 17, 18, 22, 23	—
Box	4, 5, 6, 8, 9, 10, 12, 13, 15, 19	1, 2, 6, 7, 13, 19, 20, 23
4, 5, 6, 8, 9, 11, 12, 13, 15, 23	4, 5, 6, 8, 9, 11, 12, 13, 15, 23	6, 7, 18, 23
1, 2, 6, 7, 13, 19, 20, 23	0, 3, 4, 6, 8, 10, 11, 12, 13, 14, 15, 17, 18, 22, 23	6, 7, 13, 23
6, 7, 13, 23	—	6, 7, 18, 23

2	x				
3	x	x			
4	x	x	x		
5	x	x	x	x	
6	x	x	x	x	x
	1	2	3	4	5

	a	b
Int 0, 4, 10, 15	—	1, 2, 5, 6, 12, 13, 14
1, 2, 5, 6, 10, 13, 14	0, 3, 4, 6, 7, 8, 11, 13, 14, 15, 16, 17	—
0, 3, 4, 6, 7, 8, 11, 12, 14, 15, 17	6, 7, 8, 10, 14, 15, 16, 17	1, 2, 5, 6, 9, 12, 13, 14, 17
6, 7, 8, 13, 14, 15, 16, 17	6, 7, 13, 14, 15, 16, 17	8, 9, 17
1, 2, 5, 6, 9, 12, 13, 14, 17	0, 3, 4, 6, 7, 8, 11, 13, 14, 15, 16, 17	—
6, 7, 13, 14, 15, 16, 17	6, 7, 8, 13, 14, 15, 16, 17	—
8, 9, 17	—	8, 9, 17

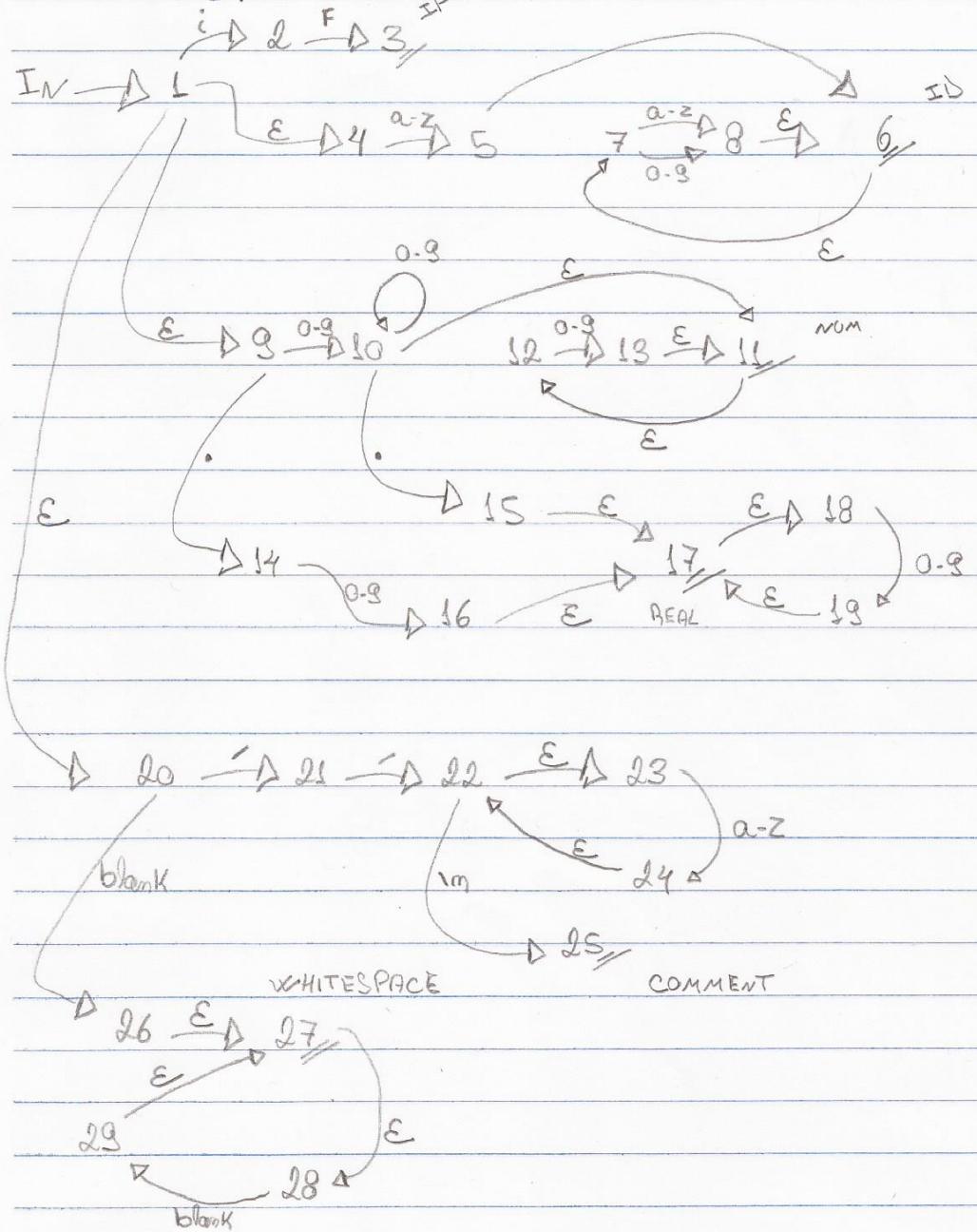


2	x						
3	x	x					
4	x	x	x				
5	x	x	x	x			
6	x	x	x	x	x		
7	x	x	x	x	x	x	
	1	2	3	4	5	6	

Ao considerar os AFDs minimos para cada autômato inicial e compará-los, é possível concluir que eles não equivalentes.  
Cadeia aceita por ambos: ba.

Suiflhoeme Henrique Gonçalves Silveira

LISTA 4 - EXERCICIO 4 - LETRA a



Gustavo Henrique Gonçalves S. da





T  
S " N  
" Z  
Z

LISTA 4 EXERCICIO 4 LETRA b

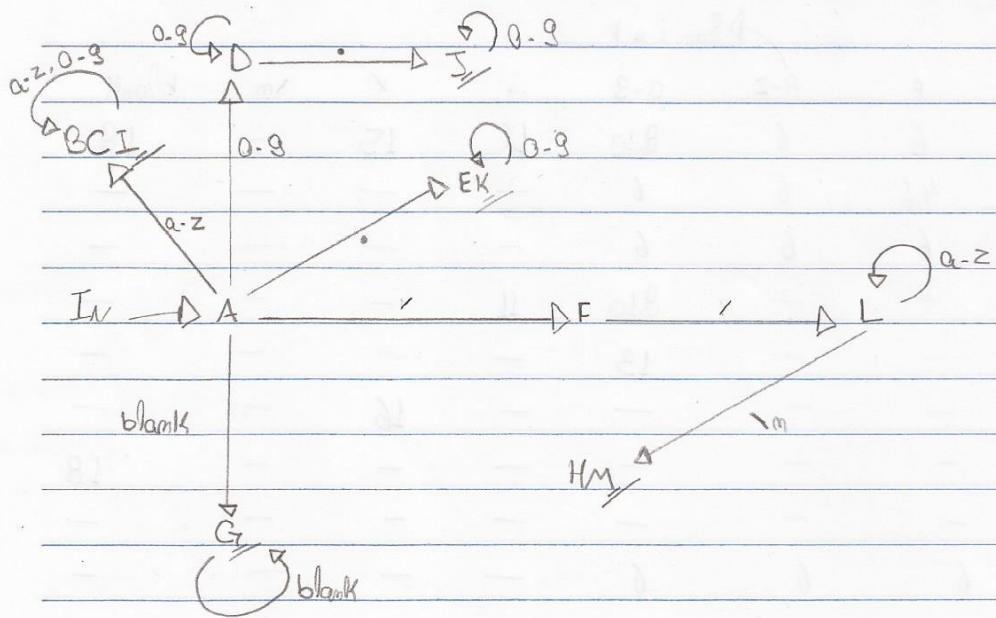
	i	f	A-Z	0-9	.	/	m	blank
S, 7, 9, 12, 14,	3,6	6	6	8,10	12	15	-	18
B	3,6	6	4,6	6	6	-	-	-
C	6	6	6	6	6	-	-	-
D	8,10	-	-	-	8,10	11	-	-
E	12	-	-	-	13	-	-	-
F	15	-	-	-	-	-	16	-
G	18	-	-	-	-	-	-	18
H	20	-	-	-	-	-	-	-
I	4,6	6	6	6	-	-	-	-
S	11	-	-	-	11	-	-	-
K	13	-	-	-	13	-	-	-
L	16	16	16	-	-	-	17	-
M	17	-	-	-	-	-	-	-

Guilherme Henrique Gonçalves Silva

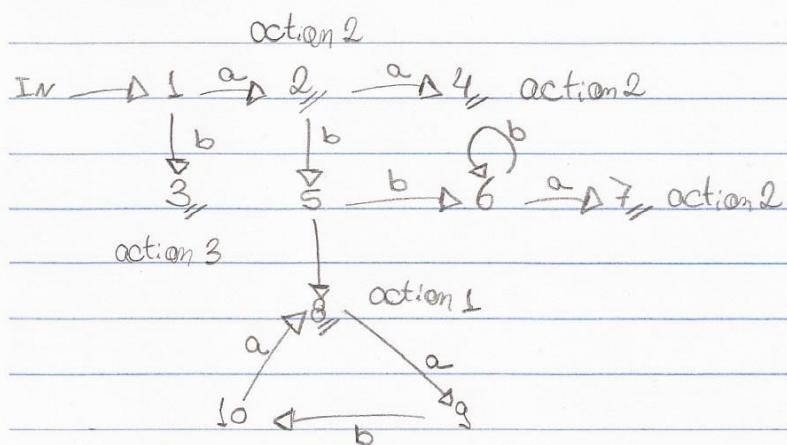




B	x										
C	x										
D	x	x	x								
E	x	x	x	x							
F	x	x	x	x	x						
G	x	x	x	x	x	x					
H	x	x	x	x	x	x	x				
I	x			x	x	x	x	x			
J	x	x	x	x	x	x	x	x			
K	x	x	x	x		x	x	x	x		
L	x	x	x	x	x	x	x	x	x	x	
M	x	x	x	x	x	x	x	x	x	x	x
A	B	C	D	E	F	G	H	I	J	K	L

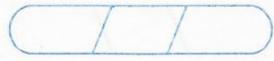


LISTA\_5\_EXERCICIO\_3



Last Final	Current State	Current Input	Accept Action
0	1	abaabbaba	
2	2		
2	5		
8	8		
8	9		
8	10		
8	$\emptyset$	a b a	(action 1)
0	1		
2	2		
2	5		
2	6		
7	7		
7	$\emptyset$	a b b a	(action 2)
0	1		
3	3		
3	$\emptyset$	b	(action 3)
0	1		

Séraphime Henrique Gonçalves Silve



Last Final	Current State	Current Input	Accept Action
2	2		
2	0	a	Cartier 3.)



Suharneen Harriqaa Gangher Saha