Lista 02 - Bloco de controle e datapath

Aluno: Lucas Nobrega Damacena - 535873

01)

a)2 b)3 c)4 d)5 e)10

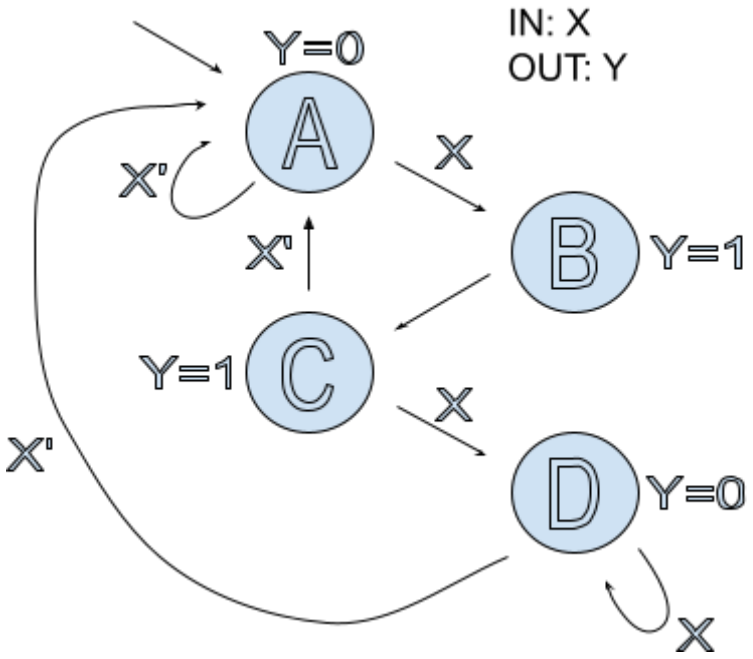
02)

$2^{16} = 65536$

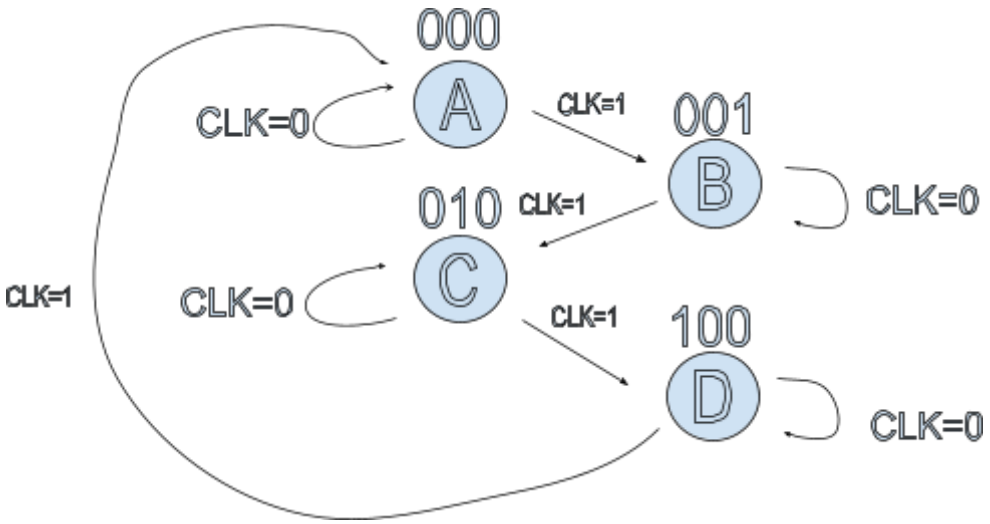
03)

2N. O número de transições não é limitado pelo número de entradas, pois diversas entradas podem levar para uma mesma transição.

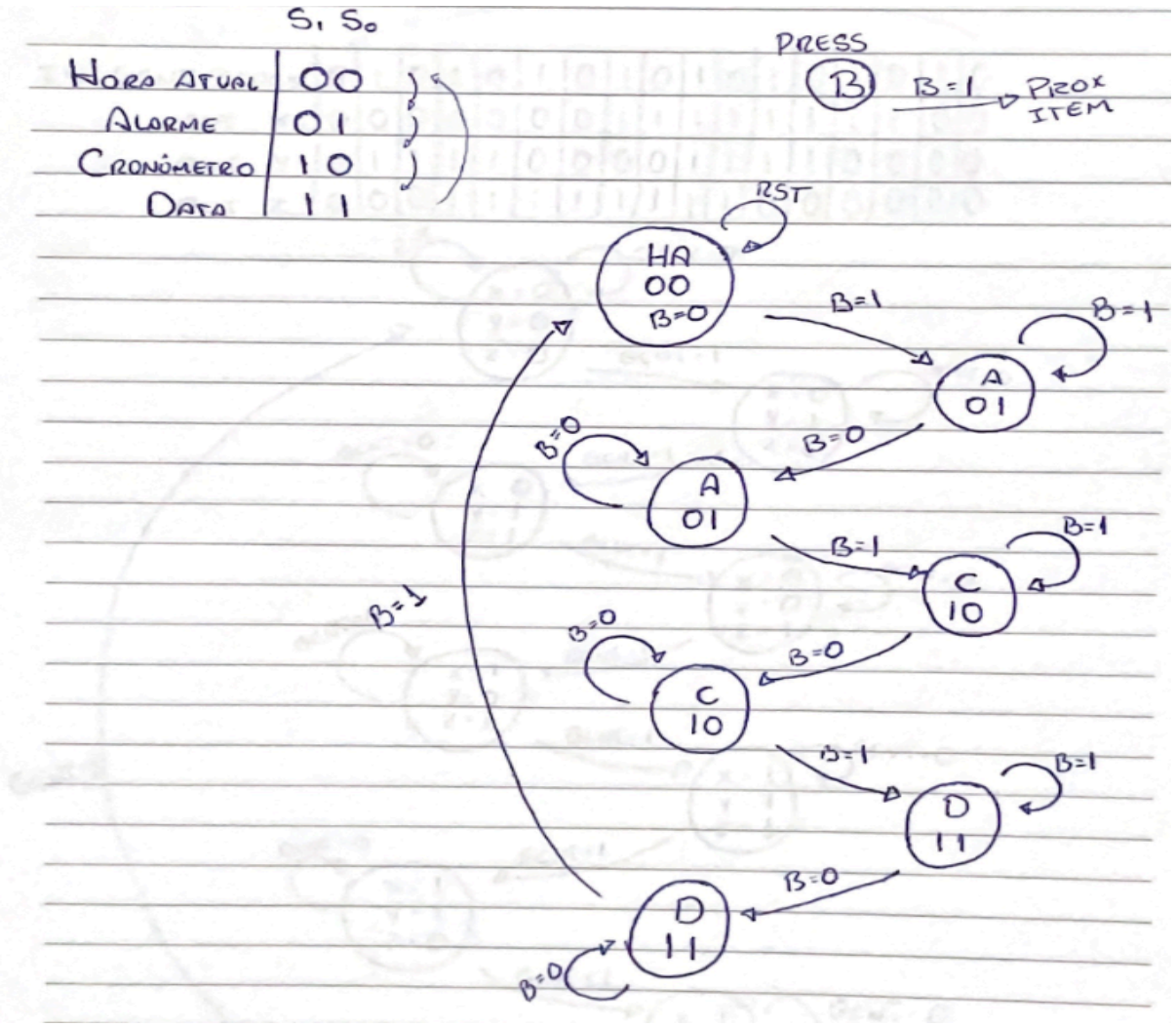
04)



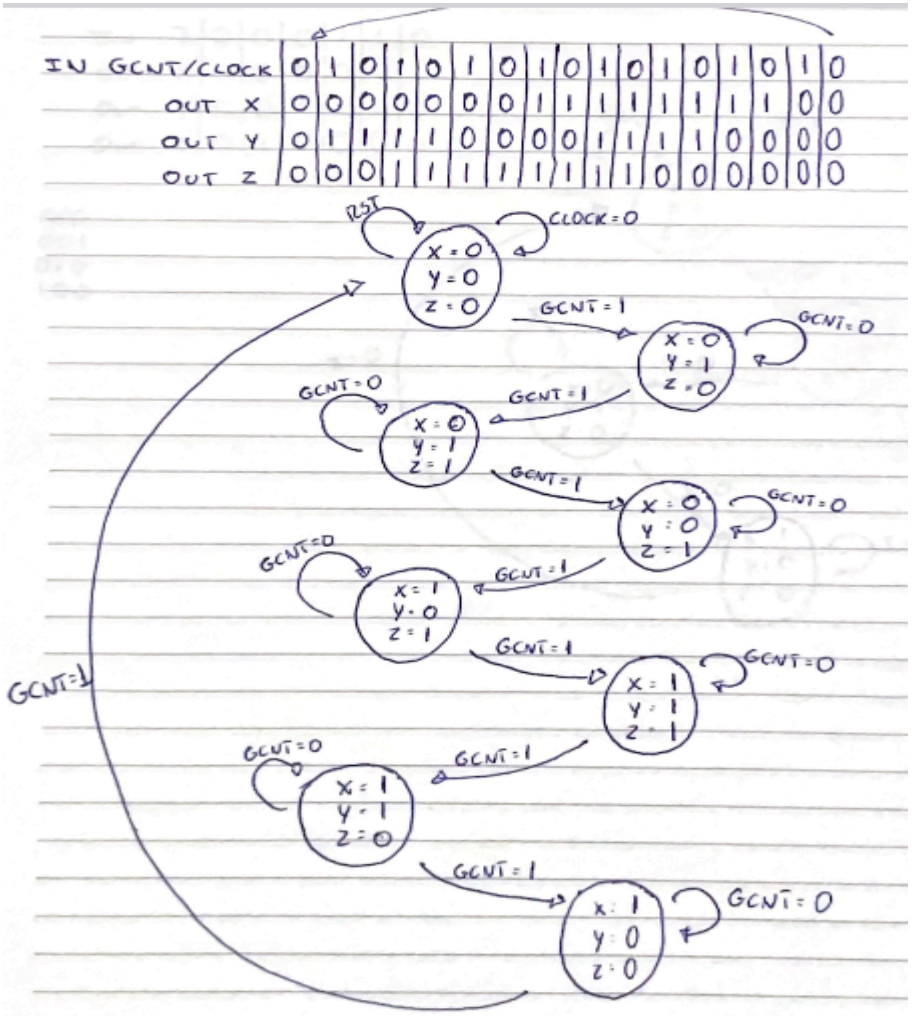
05)


000
A
CLK=0
CLK=1
001
B
CLK=0
010
CLK=1
C
CLK=0
CLK=1
CLK=1
100
D
CLK=0

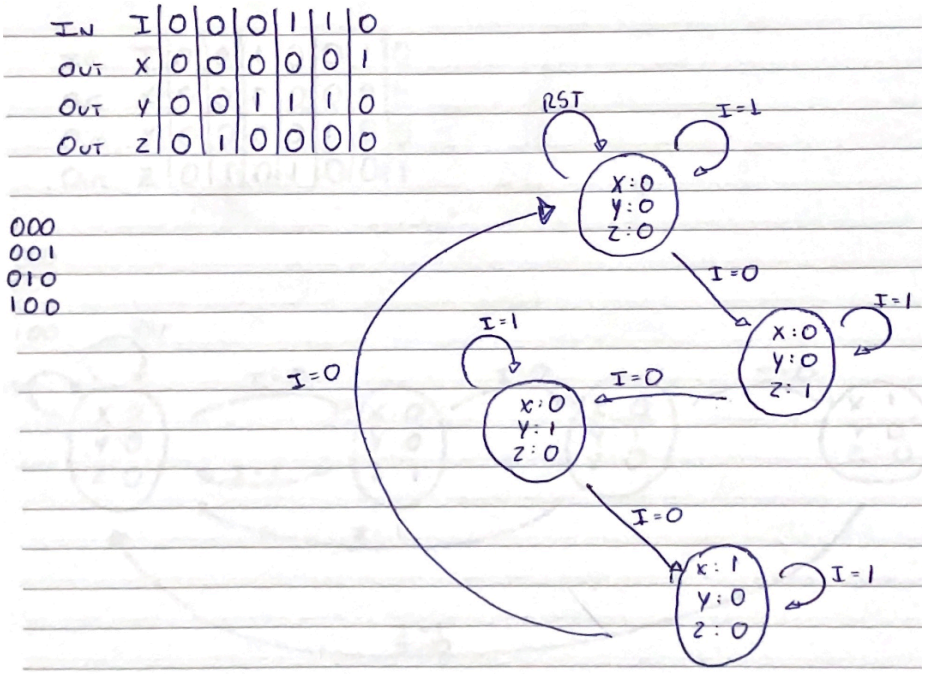
06)


S1 S0
HORA ATUAL 00
ALARME 01
CRONÔMETRO 10
DATA 11
PRESS
B
B=1
PRÓX ITEM
RST
HA
00
B=0
A
01
C
10
D
11

07)

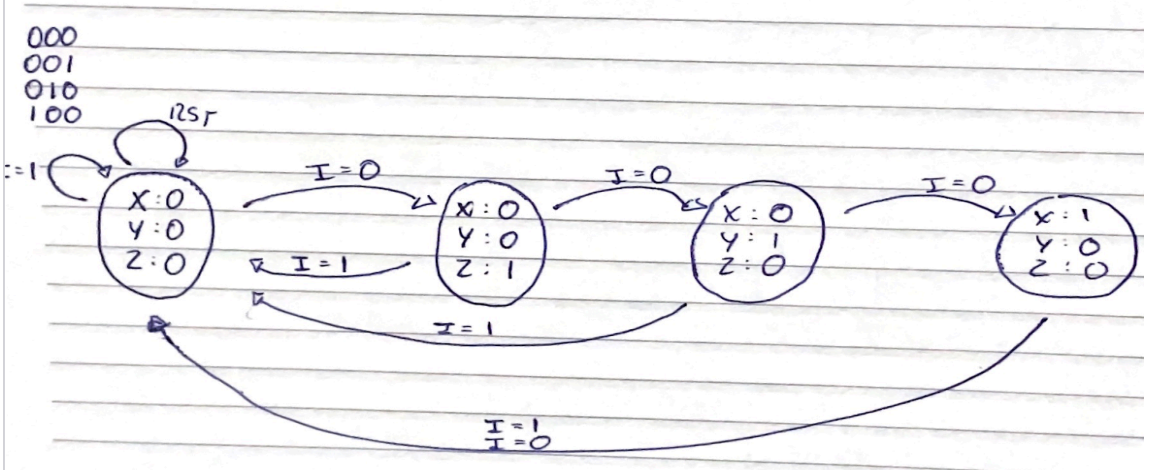

IN GCNT/CLOCK 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0
OUT X 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 0 0
OUT Y 0 1 1 1 1 0 0 0 0 1 1 1 1 0 0 0 0
OUT Z 0 0 0 1 1 1 1 1 1 1 1 0 0 0 0 0 0
RST
CLOCK=0
X=0 Y=0 Z=0
GCNT=1
X=0 Y=1 Z=0
GCNT=0
X=0 Y=1 Z=1
X=0 Y=0 Z=1
X=1 Y=0 Z=1
X=1 Y=1 Z=1
X=1 Y=1 Z=0
X=1 Y=0 Z=0
GCNT=1

08)


IN I 0 0 0 1 1 0
OUT X 0 0 0 0 0 1
OUT Y 0 0 1 1 1 0
OUT Z 0 1 0 0 0 0
000
001
010
100
RST
I=1
X:0 Y:0 Z:0
I=0
X:0 Y:0 Z:1
X:0 Y:1 Z:0
X:1 Y:0 Z:0

09)

IN	I	0	0	1	0	0	1	0
OUT	x	0	0	0	0	0	0	0
OUT	y	0	0	0	0	1	0	0
OUT	z	0	1	0	1	0	0	1



10)

	Input			Output		
s1	s0	n1	n0	x	y	z
0	0	0	1	0	0	0
0	1	1	0	0	0	1
1	0	1	1	0	1	0
1	1	0	0	1	0	0

n1 = s1’s0 + s1s0’ = s1 XOR s0

n0 = s1’s0’ + s1s0’ = s0’

x = s1s0

y = s1s0’

z = s1’s0

11)

Inputs				Outputs				
s2	s1	s0	B	n2	n1	n0	s1	s0
0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	1	0	0
0	0	1	0	0	1	0	0	1
0	0	1	1	0	0	1	0	1
0	1	0	0	0	1	0	0	1
0	1	0	1	0	1	1	0	1
0	1	1	0	1	0	0	1	0
0	1	1	1	0	1	1	1	0
1	0	0	0	1	0	0	1	0
1	0	0	1	1	0	1	1	0
1	0	1	0	1	0	1	1	1
1	0	1	1	1	1	0	1	1
1	1	0	0	1	1	0	1	1
1	1	0	1	1	1	1	1	1
1	1	1	0	0	0	0	0	0
1	1	1	1	1	1	1	0	0

n2 = s2’s1s0B’ + s2s1’ + s2s0’ + s2B
n1 = s1s0’ + s1B + s2s0B + s2’s1’s0B’
n0 = s0’B + s2’B + s1B + s2s1’s0B’
s1 = s2s0’ + s2s1’ + s2’s1s0
s0 = s1 XOR s0

12)

	Inputs				Outputs					
	s2	s1	s0	gcnt	n2	n1	n0	x	y	z
A	0	0	0	0	0	0	0	0	0	0
	0	0	0	1	0	0	1	0	0	0
B	0	0	1	0	0	0	1	0	1	0
	0	0	1	1	0	1	0	0	1	0
C	0	1	0	0	0	1	0	0	1	1
	0	1	0	1	0	1	1	0	1	1
D	0	1	1	0	0	1	1	0	0	1
	0	1	1	1	1	0	0	0	0	1
E	1	0	0	0	1	0	0	1	0	1
	1	0	0	1	1	0	1	1	0	1
F	1	0	1	0	1	0	1	1	1	1
	1	0	1	1	1	1	0	1	1	1
G	1	1	0	0	1	1	0	1	1	0
	1	1	0	1	1	1	1	1	1	0
H	1	1	1	0	1	1	1	1	0	0
	1	1	1	1	0	0	0	1	0	0

n2 = s2’s1s0gcnt + s2s1’ + s2s1s0’ + s2s1s0gcnt’
n1 = s2’s1’s0gcnt + s2’s1s0’ + s2’s1s0gcnt’ + s2s1’s0gcnt + s2s1s0’ + s2s1s0gcnt’
n0 = s2’s1’s0’gcnt + s2’s1’s0gcnt’ + s2’s1s0’gcnt + s2’s1s0gcnt’ + s2s1’s0’gcnt + s2s1’s0gcnt’ + s2s1s0’gcnt + s2s1s0gcnt’
x = s2
y = s2’s1’s0 + s2’s1s0’ + s2s1’s0 + s2s1s0’
z = s2’s1 + s2s1

13)

Inputs			Outputs		
s1	s0	a	n1	n0	y
0	0	0	0	1	0
0	0	1	0	0	0
0	1	0	0	1	1
0	1	1	1	0	1
1	0	0	1	1	1
1	0	1	1	1	1
1	1	0	0	0	0
1	1	1	0	0	0

n1 = s1’s0a + s1s0’a’ + s1s0’a = s1’s0a + s1s0’
n0 = s1’s0’a’ + s1’s0a’ + s1s0’a’ + s1s0’a = s1’a’ + s1s0’
y = s1’s0a’ + s1’s0a + s1s0’a’ + s1s0’a = s1’s0 + s1s0’ = s1 xor s0

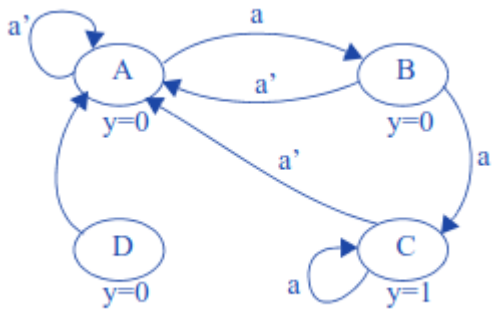
14)

Inputs				Outputs		
s1	s0	a	b	n1	n0	y
0	0	0	0	1	0	0
0	0	0	1	0	1	0
0	0	1	0	0	0	0
0	0	1	1	0	0	0
0	1	0	0	0	1	1
0	1	0	1	0	1	1
0	1	1	0	1	0	1
0	1	1	1	1	0	1
1	0	0	0	1	0	1
1	0	0	1	1	1	1
1	0	1	0	1	0	1
1	0	1	1	1	1	1
1	1	0	0	0	0	0
1	1	0	1	0	0	0
1	1	1	0	0	0	0
1	1	1	1	0	0	0

n1 = s1’s0’a’b’ + s1’s0a + s1s0’
n0 = s1’s0’a’b + s1’s0a’ + s1s0’b
y = s1’s0 + s1s0’

15)

Inputs			Outputs		
s1	s0	a	n1	n0	y
0	0	0	0	0	0
0	0	1	0	1	0
0	1	0	0	0	0
0	1	1	1	0	0
1	0	0	0	0	1
1	0	1	1	0	1
1	1	0	0	0	0
1	1	1	0	0	0



16)