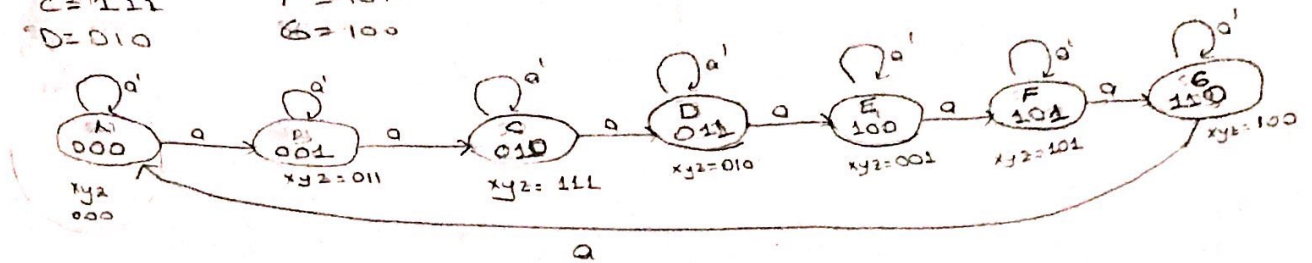


$A = 000$   
 $B = 011$   
 $C = 111$   
 $D = 010$   
 $E = 001$   
 $F = 101$   
 $G = 100$



- 7 states (3 bits register)
- a is input.
- 3 outputs ( $x, y, z$ )

States	$S_2$	$S_1$	$S_0$
A	0	0	0
B	0	0	1
C	0	1	0
D	0	1	1
E	1	0	0
F	1	0	1
G	1	1	0

	$S_2$	$S_1$	$S_0$	a	$n_2$	$n_1$	$n_0$	x	y	z
0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	0	1	0	0	0
2	0	0	1	0	0	0	1	0	1	1
3	0	0	1	1	0	1	0	0	1	1
4	0	1	0	0	0	1	0	1	1	1
5	0	1	0	1	0	1	1	1	1	1
6	0	1	1	0	0	1	1	0	1	0
7	0	1	1	1	1	0	0	0	1	0
8	1	0	0	0	1	0	0	0	0	1
9	1	0	0	1	1	0	1	0	0	1
10	1	0	1	0	1	0	1	1	0	1
11	1	0	1	1	1	1	0	1	0	1
12	1	1	0	0	1	1	0	1	0	0
13	1	1	0	1	0	0	0	1	0	0
14	1	1	1	0	0	0	0	0	0	0
15	1	1	1	1	0	0	0	0	0	0

$n_2 = \sum (7, 8, 9, 10, 11, 12)$   
 $n_1 = \sum (3, 4, 5, 6, 11, 12)$   
 $n_0 = \sum (1, 2, 5, 6, 9, 10)$

$x = \sum (4, 5, 10, 11, 12, 13)$   
 $y = \sum (2, 3, 4, 5, 6, 7)$   
 $z = \sum (2, 3, 4, 5, 8, 9, 10, 11)$

X

$S_0 \backslash S_1 S_2$	00	01	11	10
00	0			2
01	1	4	5	6
11	12	13	15	14
10	8		9	10

$$x = S_1 S_2' + S_0 S_1' S_2$$

Y

$S_0 \backslash S_1 S_2$	00	01	11	10
00	0	1	3	2
01	1	4	5	6
11	12	13	15	14
10	8	9	11	10

$$y = S_0' S_2 + S_0' S_1$$

Z

$S_0 \backslash S_1 S_2$	00	01	11	10
00	0		1	2
01	1	4		6
11	12	13	15	14
10	8	9	11	10

$$z = S_1' S_2 + S_0' S_1 S_2' + S_0 S_1'$$

$N_2$

$S_0 \backslash S_1 S_2$	00	01	11	10
00	0	1	3	2
01	4	5	6	
11	12	13	15	14
10	8	9	11	10

$$N_2 = S_0' S_1 S_2 a + S_0 S_2' a' + S_0 S_1'$$

$N_1$

$S_0 \backslash S_1 S_2$	00	01	11	10
00	0	1	3	2
01	4	5	6	
11	12	13	15	14
10	8	9	11	10

$$N_1 = S_1' S_2 a + S_0' S_1 S_2' + S_0' S_1 0' + S_1 S_2' 0'$$

No

$s_2 s_1$	$s_2 a$	00	01	11	10
00	0		1		3
01	4		1		7
11	12		1		15
10	8		1		14

$$N_0 = S_1' S_2' a + S_1' S_2 a' + S_0' S_2' a + S_0' S_2 a'$$

