



FSM model

S0 = 000

S1 = 001

S2 = 010

S3 = 011

S4 = 100

Present State	Next State	
	X = 0	X = 1
S0	S1	S2
S1	S1	S3
S2	S4	S2
S3	S4	S2
S4	S1	S3

5 states => 3FF

Present State Q2Q1Q0	Next State Q2* Q1* Q0*		Output Z	C_State HEX[2:0]	N_State HEX[2:X]	
	X = 0	X = 1			X=0	X=1
000	001	010	0	000	0010	0100
001	001	011	0	001	0010	0110
010	100	010	0	010	1000	0100
011	100	010	1	011	1000	0100
100	001	011	1	100	0010	0110
101	000	000	0	101	0000	0000
110	000	000	0	110	0000	0000
111	000	000	0	111	0000	0000

Phân tích C\_State

Q1 Q0	00	01	11	10
Q2				
0				
1	1	1	1	1

Q1 Q0	00	01	11	10
Q2				
0	0	0	1	1
1			1	1

HEX[2] = Q2

HEX[1] = Q1

Q1 Q0	00	01	11	10
Q2				
0		1	1	
1		1	1	

HEX[0] = Q0

### Phân trình N\_State

Q2 Q1 \ Q0 X	00	01	11	10
00	0	0	0	0
01	1	0	0	1
11	0	0	0	0
10	0	0	0	0

$$\text{HEX}[2] = Q2'Q1X' = D2$$

Q2 Q1 \ Q0 X	00	01	11	10
00	0	1	1	0
01	0	1	1	0
11	0	0	0	0
10	0	1	0	0

$$\text{HEX}[1] = Q2'X + Q1'Q0'X = D1$$

Q2 Q1 \ Q0 X	00	01	11	10
00	1	0	1	1
01	0	0	0	0
11	0	0	0	0
10	1	1	0	0

$$\text{HEX}[0] = Q1'Q0'X' + Q2Q1'Q0' + Q2'Q1'Q0 = D0$$

Q2 Q1 \ Q0 X	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	0	0	0
10	0	0	0	0

$$\text{HEX}[X] = 1$$

### Phân trình Output Z

Q2 \ Q1 Q0	00	01	11	10
0	0	0	1	0
1	1	0	0	0

$$Z = Q2'Q1Q0 + Q2Q1'Q0'$$

