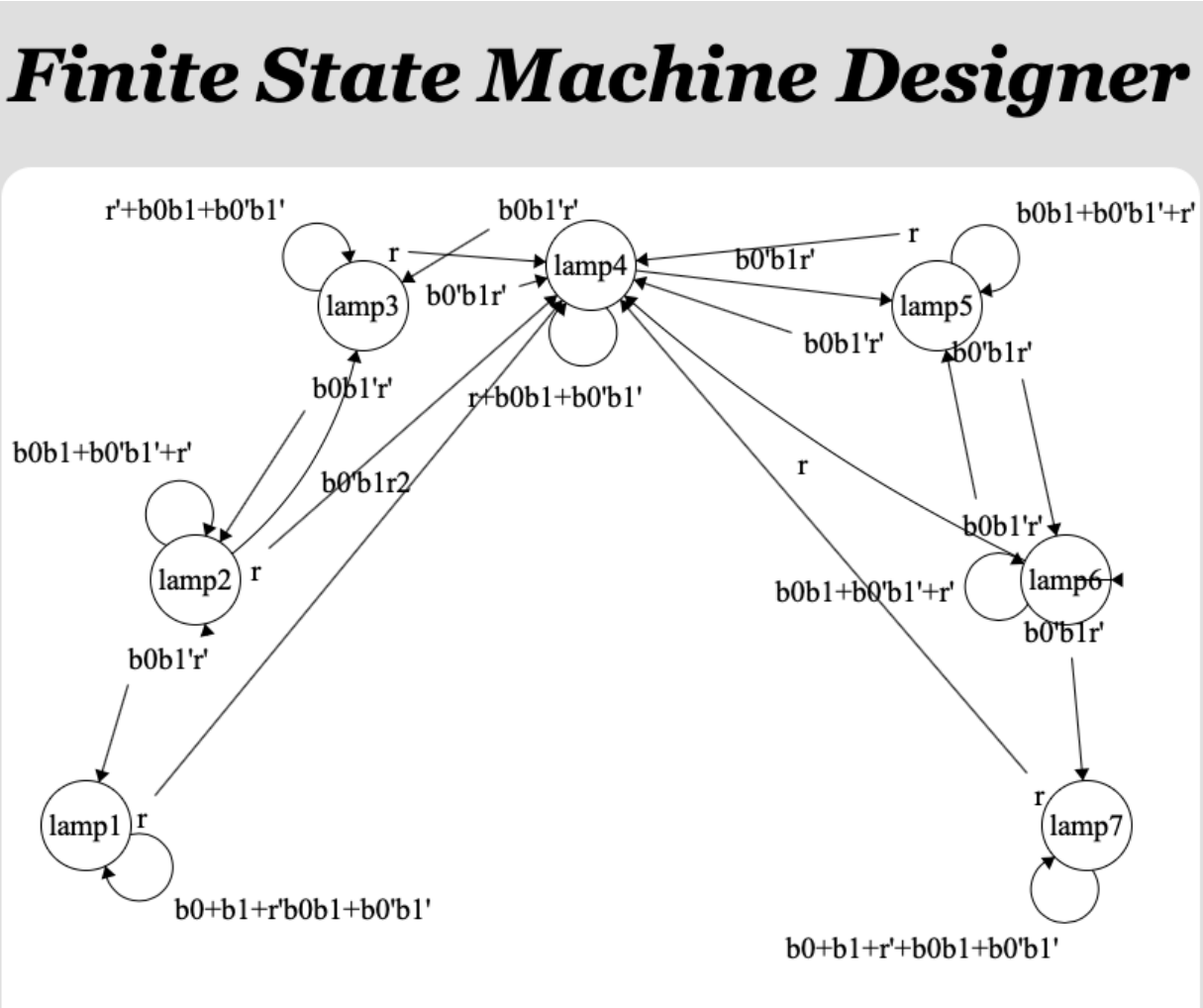
PROJECT 1 REPORT



TRUTH TABLE

S2	S1	S0	B1	B0	R	N2	N1	N0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	0
0	0	0	0	1	0	1	0	0
0	0	0	0	1	1	0	0	0
0	0	0	1	0	0	0	0	1
0	0	0	1	0	1	0	0	0
0	0	0	1	1	0	0	0	0
0	0	0	1	1	1	0	0	0
0	0	1	0	0	0	0	0	0
0	0	1	0	0	1	0	0	0
0	0	1	0	1	0	0	0	0
0	0	1	0	1	1	0	0	0
0	0	1	1	0	0	0	1	0
0	0	1	1	0	1	0	0	0
0	0	1	1	1	0	0	0	1
0	0	1	1	1	1	0	0	0
0	1	0	0	0	0	0	1	0
0	1	0	0	0	1	0	0	0
0	1	0	0	1	0	0	0	1
0	1	0	0	1	1	0	0	0
0	1	0	1	0	0	0	1	1
0	1	0	1	0	1	0	0	0
0	1	0	1	1	0	0	1	0
0	1	0	1	1	1	0	0	0
0	1	1	0	0	0	0	1	1
0	1	1	0	0	1	0	0	0
0	1	1	0	1	0	0	1	1
0	1	1	0	1	1	0	0	0
0	1	1	1	0	0	0	1	1
0	1	1	1	0	1	0	0	0
0	1	1	1	1	0	0	1	1
0	1	1	1	1	1	0	0	0
1	0	0	0	0	0	1	0	0
1	0	0	0	0	1	0	0	0

1	0	0	0	1	0	1	0	1
1	0	0	0	1	1	0	0	0
1	0	0	1	0	0	0	0	0
1	0	0	1	0	1	0	0	0
1	0	0	1	1	0	0	0	0
1	0	0	1	1	1	1	0	0
1	0	1	0	0	0	0	0	0
1	0	1	0	0	1	1	0	1
1	0	1	0	1	0	0	0	0
1	0	1	0	1	1	1	1	0
1	0	1	1	0	0	0	0	0
1	0	1	1	0	1	1	0	0
1	0	1	1	1	0	0	0	0
1	0	1	1	1	1	1	0	1
1	1	0	0	0	0	1	1	0
1	1	0	0	0	1	0	0	0
1	1	0	0	1	0	1	1	0
1	1	0	0	1	1	0	0	0
1	1	0	1	0	0	1	1	0
1	1	0	1	0	1	0	0	0
1	1	0	1	1	0	1	1	0
1	1	0	1	1	1	0	0	0
1	1	1	0	0	0	X	X	X
1	1	1	0	0	1	X	X	X
1	1	1	0	1	0	X	X	X
1	1	1	0	1	1	X	X	X
1	1	1	1	0	0	X	X	X
1	1	1	1	0	1	X	X	X
1	1	1	1	1	0	X	X	X
1	1	1	1	1	1	X	X	X

BOOLEAN EXPRESSIONS

N2 = S1’S0’B1’B0R’ + S2B1’R’ + S2B0R’ + S2S0R’ + S2S1R’

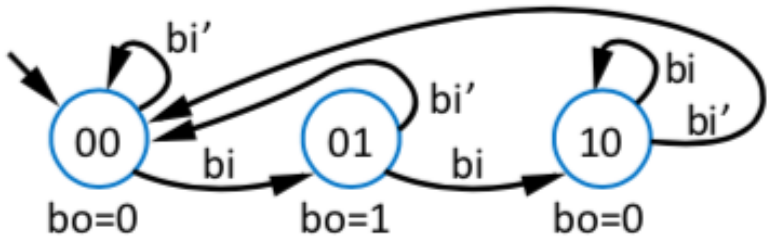
N1 = S2’S0B1B0’R2 + S1B0’R’ + S1B1R’ + S1S0R’ + S2S0B1’B0R’ + S2S1R’

N0 = S2’S0’B1B0’R’ + S0B1’B0’R’ + S0B1B0R’ S2’S1B1’B0R’ + S1S0R’ + S2S1’S0’B1’B0R’

(It is a revised version.)

When lamp 1 and lamp 7 arrive, there is no movement unless the reset is pressed because the game is over. When the reset is pressed, the new game starts. A new DSM has been designed for the simultaneous don't press of two buttons. If neither button is pressed, there is no movement. When the reset is pressed anywhere, new game start.

BUTTON PRESS SYNCHRONİZER



	Combinational logic					
	Inputs			Outputs		
	s1	s0	bi	n1	n0	bo
A	0	0	0	0	0	0
	0	0	1	0	1	0
B	0	1	0	0	0	1
	0	1	1	1	0	1
C	1	0	0	0	0	0
	1	0	1	1	0	0
unused	1	1	0	0	0	0
	1	1	1	0	0	0

N1 = s1’s0bi + s1s0bi

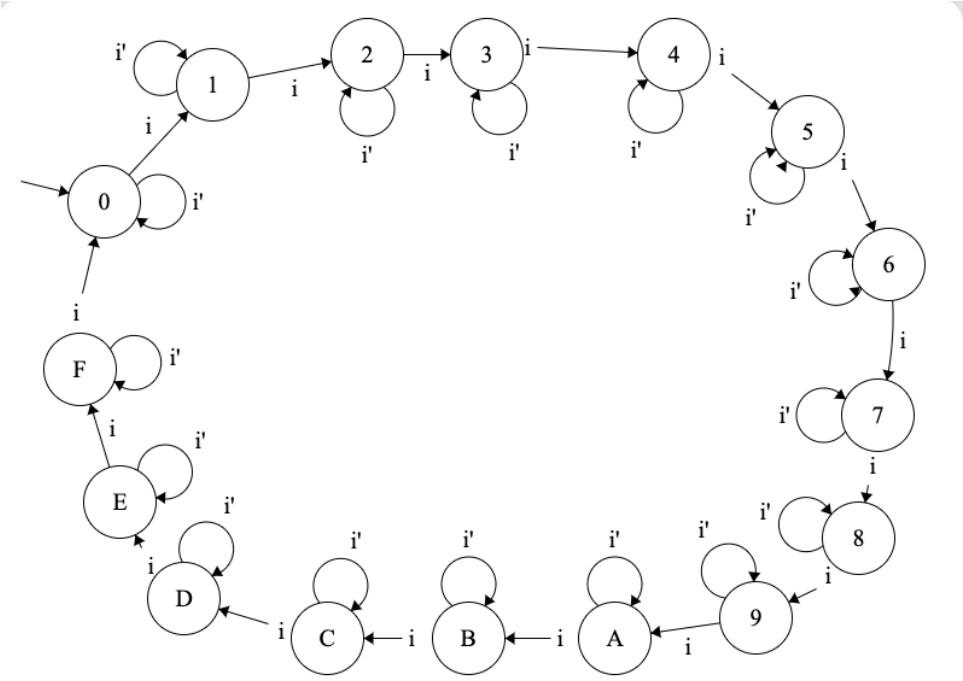
N0 = s1’s0’bi

B0 = s1s0

BONUS PART

HEX DIGIT DISPLAY

STATE DIAGRAM



TRUTH TABLE

s3	s2	s1	s0	i	n3	n2	n1	n0
0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0	1
0	0	0	1	0	0	0	0	1
0	0	0	1	1	0	0	1	0
0	0	1	0	0	0	0	1	0
0	0	1	0	1	0	0	1	1
0	0	1	1	0	0	0	1	1
0	0	1	1	1	0	1	0	0
0	1	0	0	0	0	1	0	0
0	1	0	0	1	0	1	0	1
0	1	0	1	0	0	1	0	1
0	1	0	1	1	0	1	1	0
0	1	1	0	0	0	1	1	0
0	1	1	0	1	0	1	1	1
0	1	1	1	0	0	1	1	1
0	1	1	1	1	1	0	0	0
1	0	0	0	0	1	0	0	0
1	0	0	0	1	1	0	0	1
1	0	0	1	0	1	0	0	1
1	0	0	1	1	1	0	1	0
1	0	1	0	0	1	0	1	0
1	0	1	0	1	1	0	1	1
1	0	1	1	0	1	0	1	1
1	0	1	1	1	1	1	0	0
1	1	0	0	0	1	1	0	0
1	1	0	0	1	1	1	0	1
1	1	0	1	0	1	1	0	1
1	1	0	1	1	1	1	1	0
1	1	1	0	0	1	1	1	0
1	1	1	0	1	1	1	1	1
1	1	1	1	0	1	1	1	1
1	1	1	1	1	0	0	0	0

N3 = S3’S2S1S0İ + S3S2’ + S3S1’ + S3S0’ + S3İ’

N2 = S2’S1S0İ + S2S1’ + S2S0’ + S2İ’

N1 = S1’S0İ + S1S0’ + S1İ’

N0 = S0’İ + S0İ’

!!! Before sending the result of the burning lamp as input, we prevent it from sending it continuously with sycnhronizer.