CSE 232 SPRING 2020

PROJECT 1

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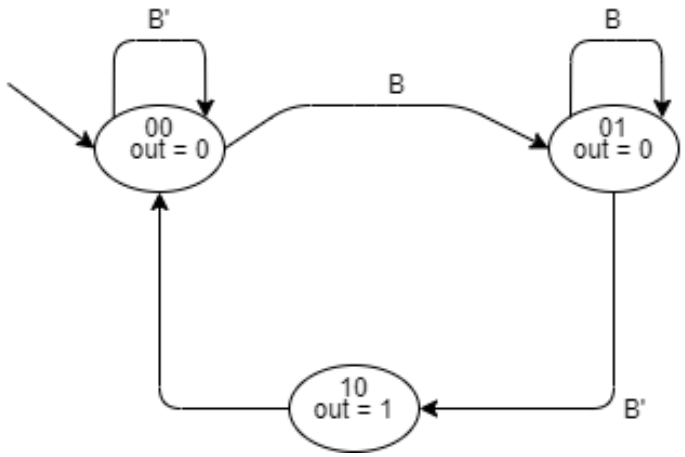
I have used this diagram to be able to prevent the pressing a button for long time.



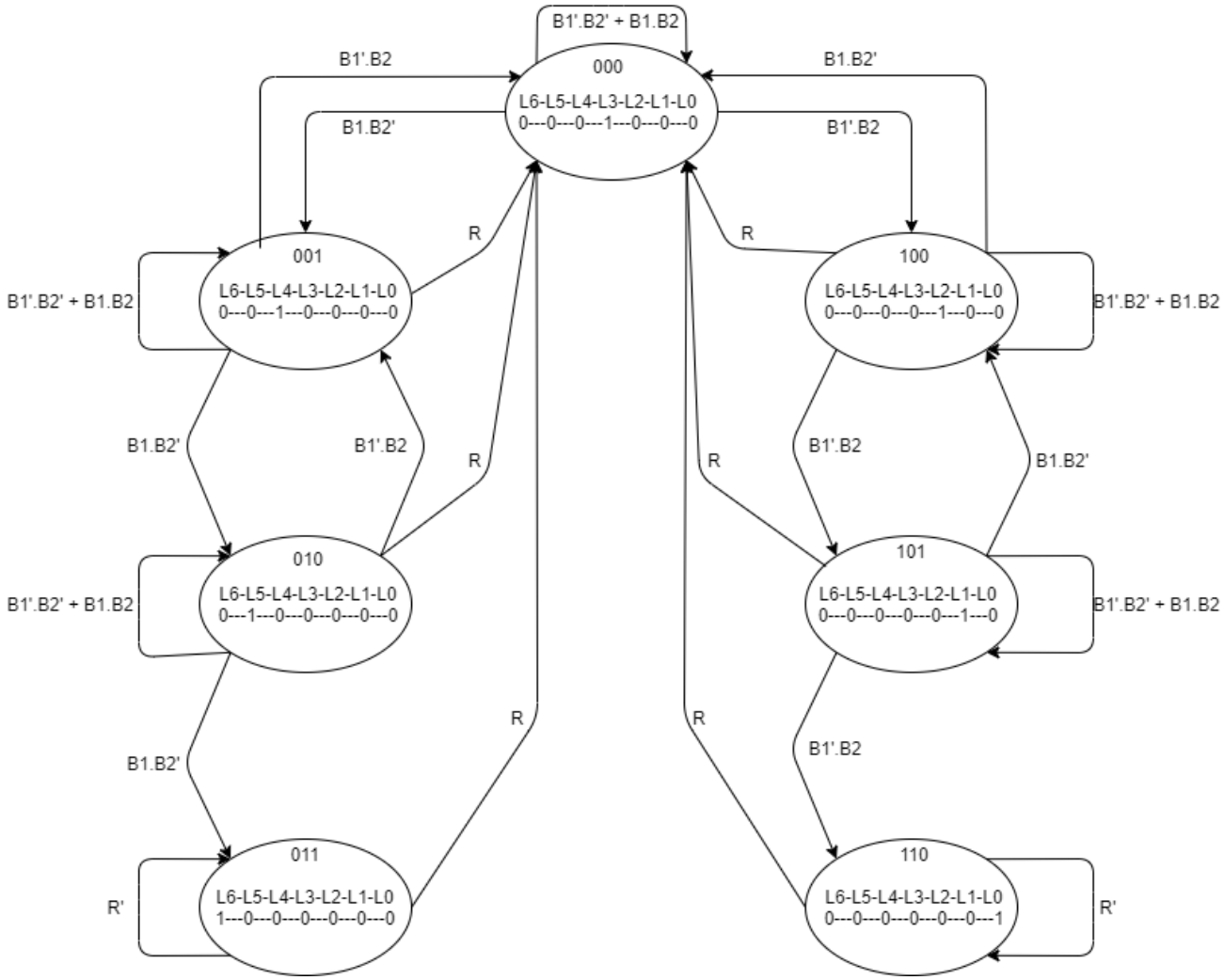
B	s1	s0	n1	n0	out
0	0	0	0	0	0
0	0	1	1	0	0
0	1	0	0	0	1
0	1	1	0	0	0
1	0	0	0	1	0
1	0	1	0	1	0
1	1	0	0	0	1
1	1	1	0	0	0

n1 = B’.s1’.s0

n0 = B.s1’

out = s1.s0’

This is the main diagram.



B1	B2	s2	s1	s0	n2	n1	n0	L6	L5	L4	L3	L2	L1	L0
0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
0	0	0	0	1	0	0	1	0	0	1	0	0	0	0
0	0	0	1	0	0	1	0	0	1	0	0	0	0	0
0	0	0	1	1	0	1	1	1	0	0	0	0	0	0
0	0	1	0	0	1	0	0	0	0	0	0	1	0	0
0	0	1	0	1	1	0	1	0	0	0	0	0	1	00
0	0	1	1	0	1	1	0	0	0	0	0	0	0	1
0	0	1	1	1	0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	1	0	0	0	0	0	1	0	0	0
0	1	0	0	1	0	0	0	0	0	1	0	0	0	0
0	1	0	1	0	0	0	1	0	1	0	0	0	0	0
0	1	0	1	1	0	1	1	1	0	0	0	0	0	0
0	1	1	0	0	1	0	1	0	0	0	0	1	0	0
0	1	1	0	1	1	1	0	0	0	0	0	0	1	0
0	1	1	1	0	1	1	0	0	0	0	0	0	0	1
0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	0	0	0	1	0	0	0

1	0	0	0	1	0	1	0	0	0	1	0	0	0	0
1	0	0	1	0	0	1	1	0	1	0	0	0	0	0
1	0	0	1	1	0	1	1	1	0	0	0	0	0	0
1	0	1	0	0	0	0	0	0	0	0	0	1	0	0
1	0	1	0	1	1	0	0	0	0	0	0	0	1	0
1	0	1	1	0	1	1	0	0	0	0	0	0	0	1
1	0	1	1	1	0	0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	1	0	0	0
1	1	0	0	1	0	0	1	0	0	1	0	0	0	0
1	1	0	1	0	0	1	0	0	1	0	0	0	0	0
1	1	0	1	1	0	1	1	1	0	0	0	0	0	0
1	1	1	0	0	1	0	0	0	0	0	0	1	0	0
1	1	1	0	1	1	0	1	0	0	0	0	0	1	0
1	1	1	1	0	1	1	0	0	0	0	0	0	0	1
1	1	1	1	1	0	0	0	0	0	0	0	0	0	0

n2 = B1’.B2’.s2.s1.s0’ + B1’.B2.s2.s1.s0’ + B1.B2’.s2.s1.s0’ + B1.B2.s2.s1.s0’ +

B1’.B2’.s2.s1’.s0‘ + B1’.B2’.s2.s1’.s0 +

B1’.B2.s2.s1’.s0’ + B1’.B2.s2.s1’.s0 +

B1.B2.s2.s1’.s0’ + B1.B2.s2.s1’.s0 +

B1’.B2.s2’.s1’.s0’ + B1.B2’.s2.s1’.s0

n2 = s2.s1.s0’ + B1’.B2’s2.s1’ + B1’.B2.s2.s1’ + B1.B2.s2.s1’ + s1’.(B1’.B2.s2’s0’ + B1.B2’.s2.s0)

n1 = B1.B2.s2.s1.s0 + B1.B2.s2.s1.s0 + B1.B2.s2.s1.s0 + B1.B2.s2.s1.s0 +

B1.B2.s2.s1.s0 + B1.B2.s2.s1.s0 + B1.B2.s2.s1.s0 + B1.B2.s2.s1.s0 +

B1.B2.s2.s1.s0 + B1.B2.s2.s1.s0 +

B1.B2.s2.s1.s0 + B1.B2.s2.s1.s0 + B1.B2.s2.s1.s0

n1 = s2’.s1.s0 + s2.s1.s0’ + B1.s2’.s1.s0’ + B2’.s2’.s0(B1 XOR s1) + B1’.B2.s2.s1’.s0

n0 = B1’.B2’.s2’.s1.s0 + B1’.B2.s2’.s1.s0 + B1.B2’.s2’.s1.s0 + B1.B2.s2’.s1.s0 +

B1.B2’.s2’.s1’.s0’ + B1.B2’.s2’.s1.s0’ +

B1.B2.s2’.s1’.s0 + B1.B2.s2.s1’.s0 +

B1’.B2’.s2’.s1’.s0 + B1’.B2’.s2.s1’.s0 +

B1’.B2.s2’.s1.s0’ + B1’.B2.s2.s1’.s0’ +

n0 = s2’.s1.s0 + B1.B2’.s2’s0’ + B1.B2.s1’.s0 + B1’.B2’.s1’.s0 + B1’.B2.s0’.(s1 XOR s2)

I have added the reset button to next state wires by using an and gate for each next state wire.

L6 = s2’.s1.s0

L5 = s2’.s1.s0’

L4 = s2’.s1’.s0

L3 = s2’.s1’.s0’

L2 = s2.s1’.s0’

L1 = s2.s1’.s0

L0 = s2.s1.s0’