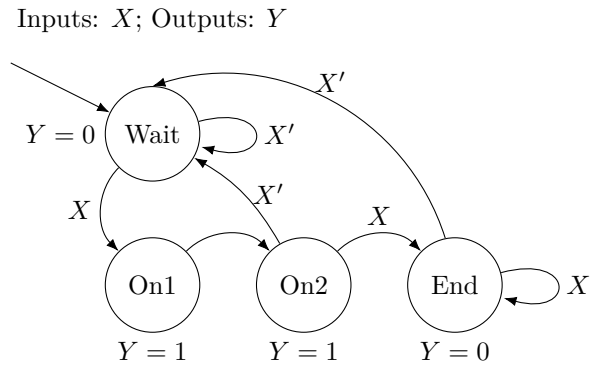


VE270 Homework 7

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Problem 1.



Problem 2.

Encode the states (s_1s_0): Wait: 00, On1: 10, On2: 11, End: 01.

The truth table is

s_1	s_0	X	n_1	n_0	Y
0	0	0	0	0	0
0	0	1	1	0	0
0	1	0	0	0	0
0	1	1	0	1	0
1	0	0	1	1	1
1	0	1	1	1	1
1	1	0	0	0	1
1	1	1	0	1	1

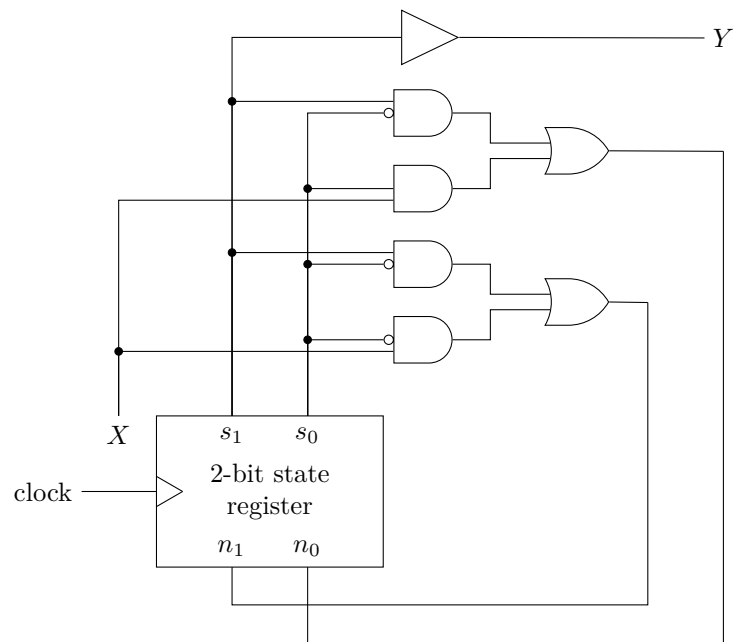
The euqations are

$$n_1 = s'_0X + s_1s'_0$$

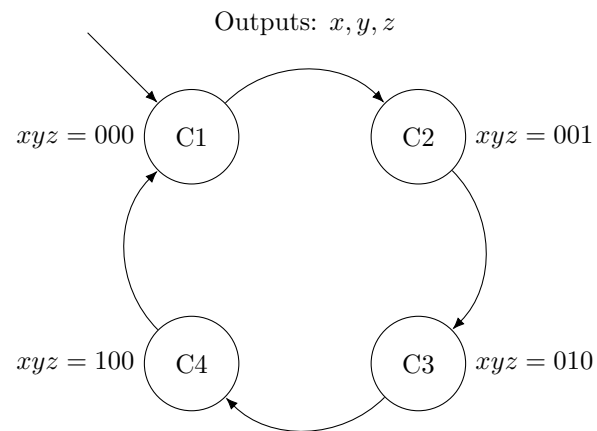
$$n_0 = s_0X + s_1s'_0$$

$$Y = s_1$$

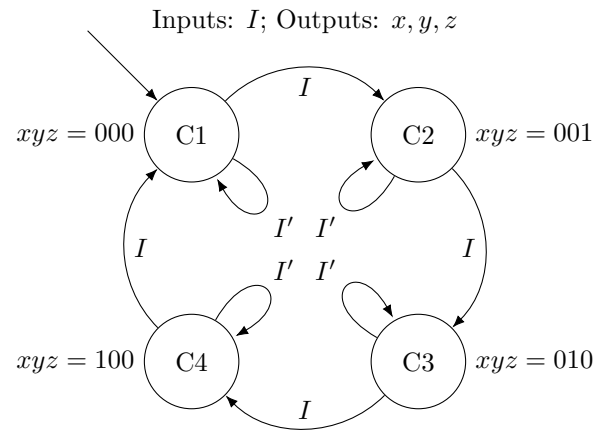
The schematics is



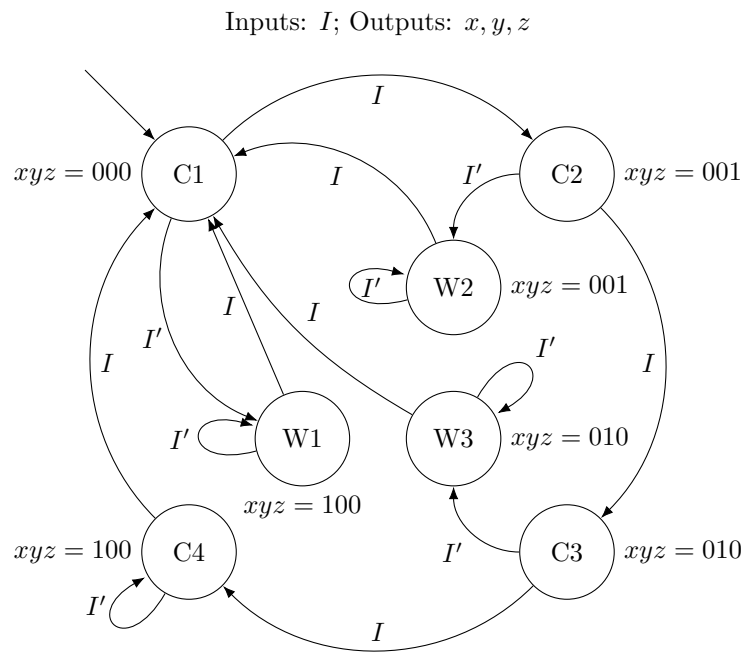
Problem 3.



Problem 4.



Problem 5.



Problem 6.

Encode the states $(s_2s_1s_0)$: C1: 000, W1: 001, C2: 010, W2: 011, C3: 100, W3: 101, C4: 110.

The truth table is

s_2	s_1	s_0	I	n_2	n_1	n_0	X	Y	Z
0	0	0	0	0	0	1	0	0	0
0	0	0	1	0	1	0	0	0	0
0	0	1	0	0	0	1	0	0	0
0	0	1	1	0	0	0	0	0	0
0	1	0	0	0	1	1	0	0	1
0	1	0	1	1	0	0	0	0	1
0	1	1	0	0	1	1	0	0	1
0	1	1	1	0	0	0	0	0	1
1	0	0	0	1	0	1	0	1	0
1	0	0	1	1	1	0	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	1	0	0	0	0	1	0
1	1	0	0	1	1	0	1	0	0
1	1	0	1	0	0	0	1	0	0
1	1	1	0	X	X	X	X	X	X
1	1	1	1	X	X	X	X	X	X

The euqations are

$$n_2 = s'_2s_1s'_0I + s_2s'_1s'_0 + s_2I'$$

$$n_1 = s'_1s'_0I + s_1I'$$

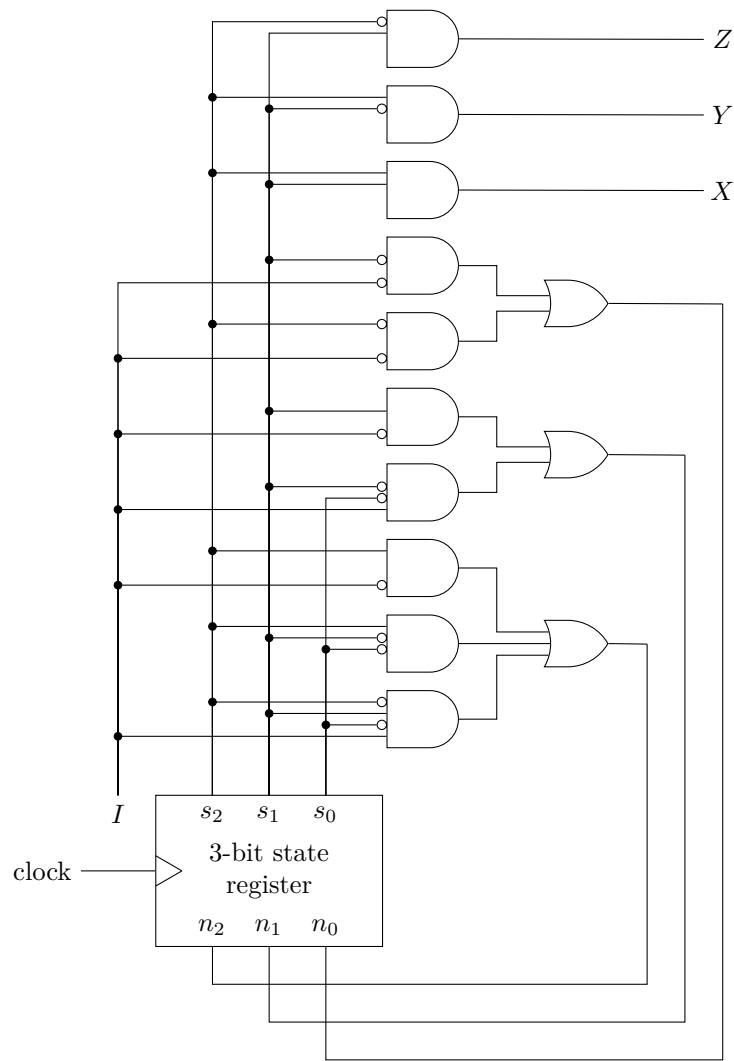
$$n_0 = s'_2I' + s'_1I'$$

$$X = s_2s_1$$

$$Y = s_2s'_1$$

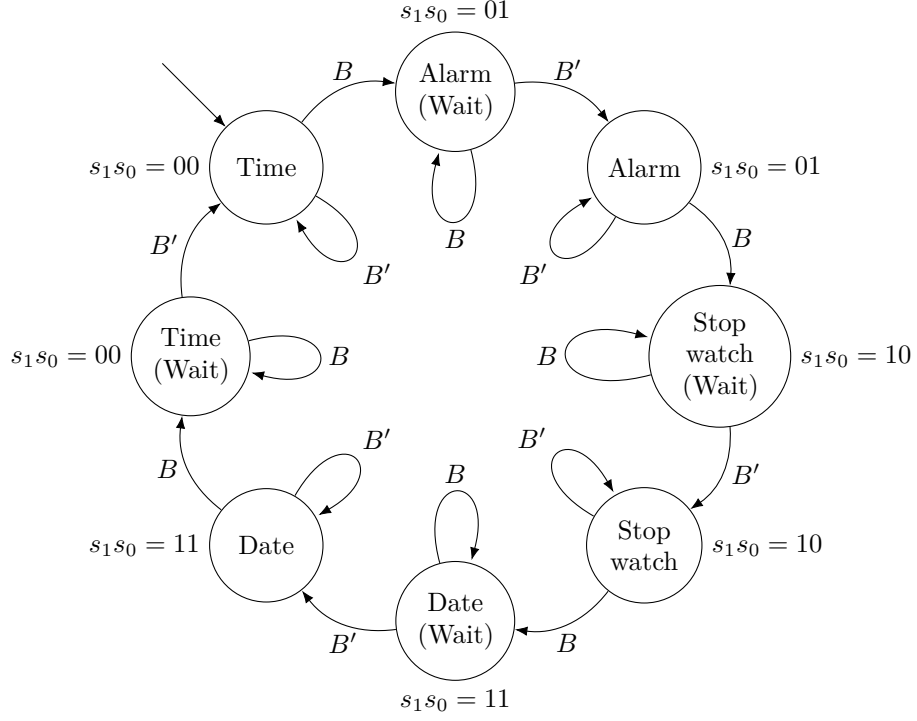
$$Z = s'_2s_1$$

The schematics is



Problem 7.

Inputs: B ; Outputs: s_1, s_0



Encode the states ($s_2s_1s_0$): Time (Wait): 000, Time: 001, Alarm (Wait): 010, Alarm: 011, Stop-watch (wait): 100, Stopwatch: 101, Date (Wait): 110, Date (Wait): 111.

The truth table is

s_2	s_1	s_0	B	n_2	n_1	n_0	s_1	s_0
0	0	0	0	0	0	1	0	0
0	0	0	1	0	0	0	0	0
0	0	1	0	0	0	1	0	0
0	0	1	1	0	1	0	0	0
0	1	0	0	0	1	1	0	1
0	1	0	1	0	1	0	0	1
0	1	1	0	0	1	1	0	1
0	1	1	1	1	0	0	0	1
1	0	0	0	1	0	1	1	0
1	0	0	1	1	0	0	1	0
1	0	1	0	1	0	1	1	0
1	0	1	1	1	1	0	1	0
1	1	0	0	1	1	1	1	1
1	1	0	1	1	1	0	1	1
1	1	1	0	1	1	1	1	1
1	1	1	1	0	0	0	1	1

The equations are

$$n_2 = s_2' s_1 s_0 B + s_2 s_1' + s_2 s_0' + s_2 B'$$

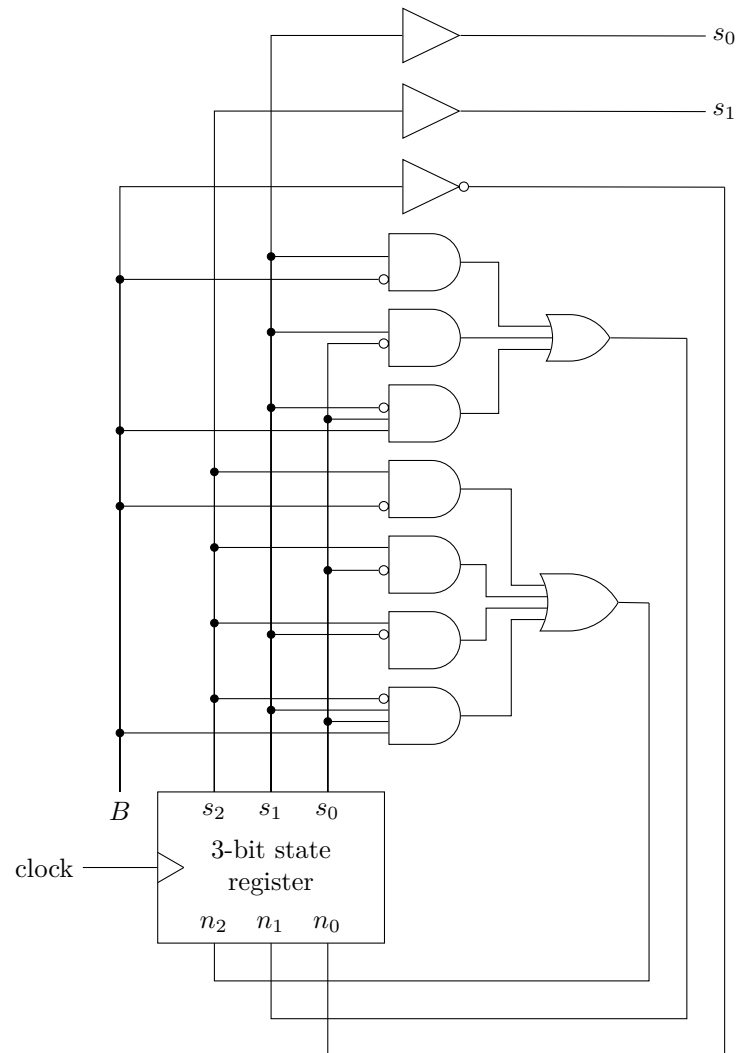
$$n_1 = s_1' s_0 B + s_1 s_0' + s_1 B'$$

$$n_0 = B'$$

$$s_1 = s_2$$

$$s_0 = s_1$$

The schematics is



Problem 8.

Same as Problem 7.