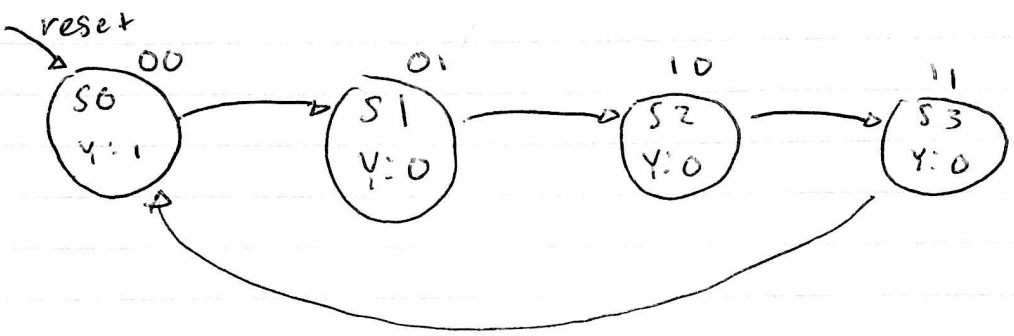
Toby Cappell

HW 8

1 A register stores the current state of the system. They are a key building block of most sequential circuits.

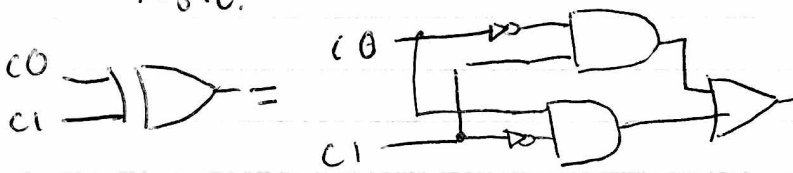
2 A N-bit register can have 2^N unique states.

3



	c1	c0	Y	n1	n0
S0	0	0	1	0	1
S1	0	1	0	1	0
S2	1	0	0	1	1
S3	1	1	0	0	0

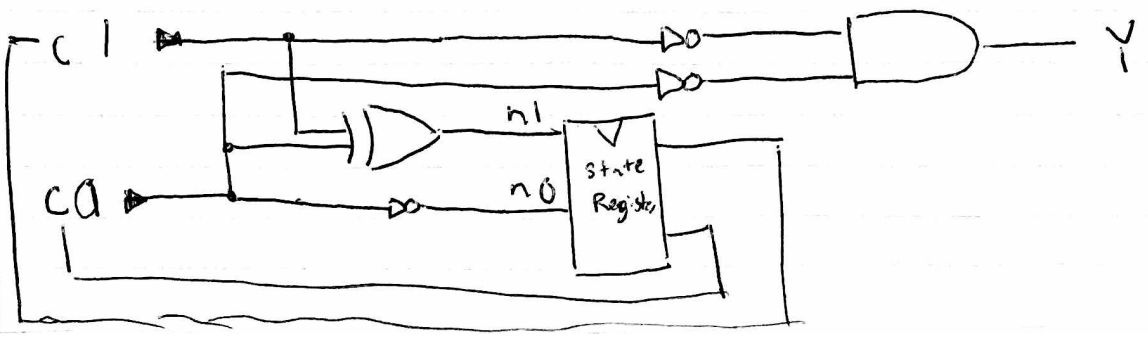
Note:



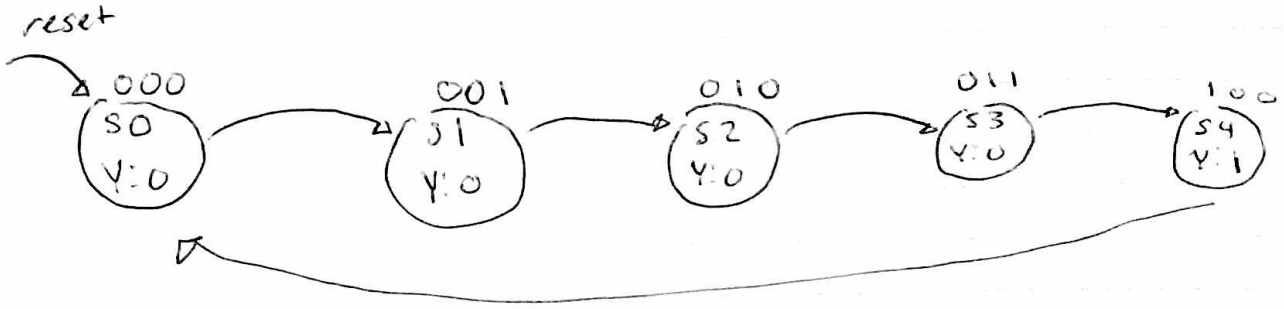
$$Y = \overline{c1}\, c0$$

$$n1 = \overline{c1}\, c0 + c1\, \overline{c0}$$

$$n0 = \overline{c1}\, \overline{c0} + c1\, \overline{c0} = \overline{c0}$$



4



c2	c1	c0	Y	n2	n1	n0
0	0	0	0	0	0	1
0	0	1	0	0	1	0
0	1	0	0	0	1	1
0	1	1	0	1	0	0
1	0	0	1	0	0	0
1	0	1	0	0	0	0
1	1	0	0	0	0	0
1	1	1	0	0	0	0

$Y = c2\,\overline{c1}\,\overline{c0}$

$n2 = \overline{c2}\,c1\,c0$

$n1 = \overline{c2}\,\overline{c1}\,c0 + \overline{c2}\,c1\,\overline{c0}$

$n0 = \overline{c2}\,\overline{c0}$