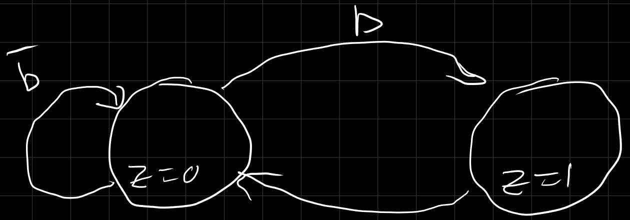
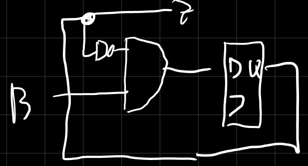
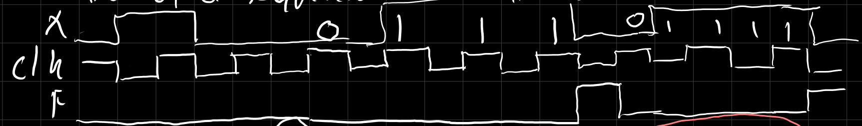


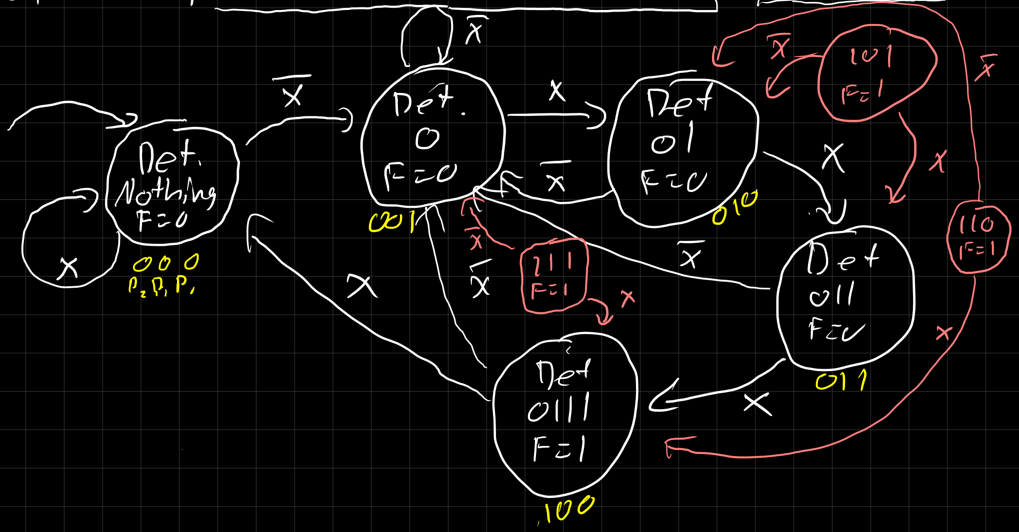
P	B	N	Z
0	0	0	0
0	1	1	0
1	0	0	1
1	1	0	1



Sequence Detector

Detect a sequence in serial data





P_2	P_1	P_0	X	N_2	N_1	N_0	F
0	0	0	0	0	0	1	0
0	0	0	1	0	0	0	0
0	0	1	0	0	0	1	0
0	0	1	1	0	1	0	0
0	1	0	0	0	0	1	0
0	1	0	1	0	1	1	0
0	1	1	0	0	0	1	0
0	1	1	1	1	0	0	0
1	0	0	0	0	0	1	1
1	0	0	1	0	0	0	1
1	0	1	0	X	X	X	X
1	0	1	1	X	X	X	X
1	1	0	0	X	X	X	X
1	1	0	1	X	X	X	X
1	1	1	0	X	X	X	X
1	1	1	1	X	X	X	X

0, 1 → stuff preprogrammed for don't cares

$F = P_2$

N_0

P_2P_1 \ P_0X	00	01	11	10
00	1			1
01	1	1		1
11	X	X	X	X
10	1		X	X

$N_0 = \bar{X} + P_1 \bar{P}_0$

$N_1 = \bar{P}_1 P_0 X + P_1 \bar{P}_0 X$
$= X(P_1 \oplus P_0)$

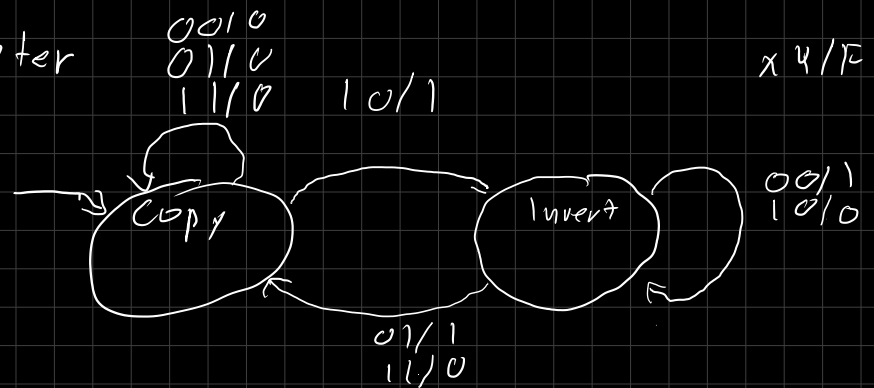
$N_2 = P_1 P_0 X$

Sequential 2's complementer

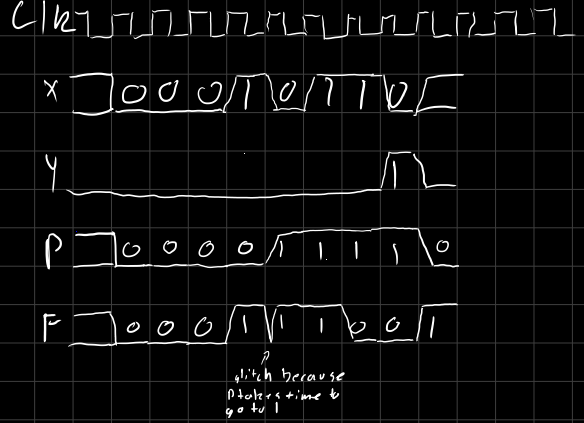
0 1 1 0 | 1 0 0 0

invert | copy

Y input → Turn on when number is done. This is the last bit of this number



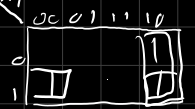
X Y / F



	P	X	Y	N	F
Copy	0	0	0	0 0	
	0	0	1	0 0	
	0	1	0	1 1	
	0	1	1	0 1	
Invert	1	0	0	1 1	
	1	0	1	0 1	
	1	1	0	1 0	
	1	1	1	0 0	

$F = \bar{P}X + P\bar{X} = P \oplus X$

N



$N = X\bar{Y} + P\bar{Y} = \bar{Y}(X + P)$