



Let Next state be $N_2 N_1 N_0$ Input
Prev. state be $P_2 P_1 P_0$

 $I_1 I_0$

00 - a

01 - b

10 - Y

11 - Y result

$P_2 P_0$	$I_1 I_0$	00	01	11	10
00	1	0	0	0	
01	1	1	0	0	
11	1	0	0	0	
10	0	0	0	0	

 $P_2 = 0$

$P_2 P_0$	$I_1 I_0$	00	01	11	10
00	1	0	0	0	
01	1	0	0	0	
11	X	X	X	X	
10	1	0	0	0	

 $P_2 = 1$

①
(N_0)

$P_1 P_0$	$I_1 I_0$	00	01	11	10
00	0	1	0	0	
01	0	1	0	0	
11	0	1	0	0	
10	0	1	0	0	

 $P_2 = 0$

$P_1 P_0$	$I_1 I_0$	00	01	11	10
00	0	1	0	0	
01	0	1	0	0	
11	X	X	X	X	
10	0	1	0	0	

 $P_2 = 1$

②
(N_1)

$P_2 P_0$	$I_1 I_0$	00	01	11	10
00	0	0	0	0	0
01	0	0	0	0	0
11	1	0	0	0	0
10	1	0	0	0	0

 $P_2 = 0$

	$I_1 I_0$	00	01	11	10
$P_1 P_0$	00	0	1	0	0
	01	0	1	0	0
	11	X	X	X	X
	10	1	0	0	0

 $P_2 = 1$

③
(N_2)

P_2	$I_1 I_0$	00	01	11	10
00	0	0	0	0	0
01	0	0	0	0	0
11	0	0	0	0	0
10	0	0	0	0	0

$P_2 = 0$

P_2	$I_1 I_0$	00	01	11	10
00	0	0	0	0	0
01	0	1	0	0	0
11	X	X	X	X	X
10	0	0	0	0	0

$P_2 = 1$

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Output

$Y = 1, N = 0$

Minimized expression for each :-

$$N_0 = P_2 \bar{I}_1 \bar{I}_0 + \bar{P}_1 \bar{I}_1 \bar{I}_0 + \bar{I}_0 \bar{I}_1 \bar{I}_0 + \bar{P}_2 \bar{P}_1 \bar{P}_0 \bar{I}_1$$

$$N_1 = \bar{I}_1 \bar{I}_0$$

$$N_2 = P_1 \bar{I}_1 \bar{I}_0 + P_2 \bar{P}_1 \bar{I}_1 \bar{I}_0$$

$$OP = \bar{P}_2 \bar{P}_1 \bar{I}_1 \bar{I}_0 + P_2 \bar{P}_0 \bar{I}_1 \bar{I}_0$$