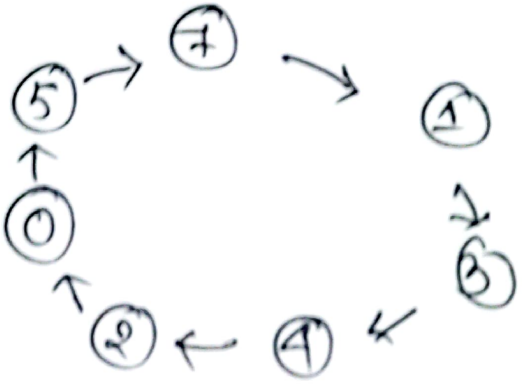
Roll: 1905105 Name: Shahriar Raj

105 % 5 = 0;

So the sequence: 7 → 1 → 3 → 4 → 2 → 0 → 5

State Diagram:



State Table:

PS	NS, Z
7	1, 0
1	3, 0
3	4, 0
4	2, 0
2	0, 0
0	5, 0
5	7, 1

Transition Table:

PS $y_2\ y_1\ y_0$	Clk	NS $Y_2\ Y_1\ Y_0$	Z
x x x	↓	NO change	
1 1 1	↑	0 0 1	
0 0 1	↑	0 1 1	
0 1 1	↑	1 0 0	0
1 0 0	↑	0 1 0	
0 1 0	↑	0 0 0	
0 0 0	↑	1 0 1	
1 0 1	↑	1 1 1	1

Excitation Table:

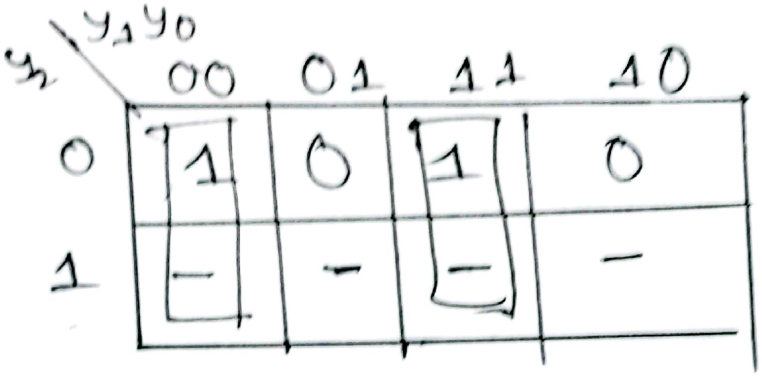
$y_2\ y_1\ y_0$	J_2	K_2	J_1	K_1	J_0	K_0
1 1 1	–	1	–	1	–	0
0 0 1	0	–	1	–	–	0
0 1 1	1	–	–	1	–	1
1 0 0	–	1	1	–	0	–
0 1 0	0	–	–	1	0	–
0 0 0	1	–	0	–	1	–
1 0 1	–	0	1	–	–	0

Exc. Req.

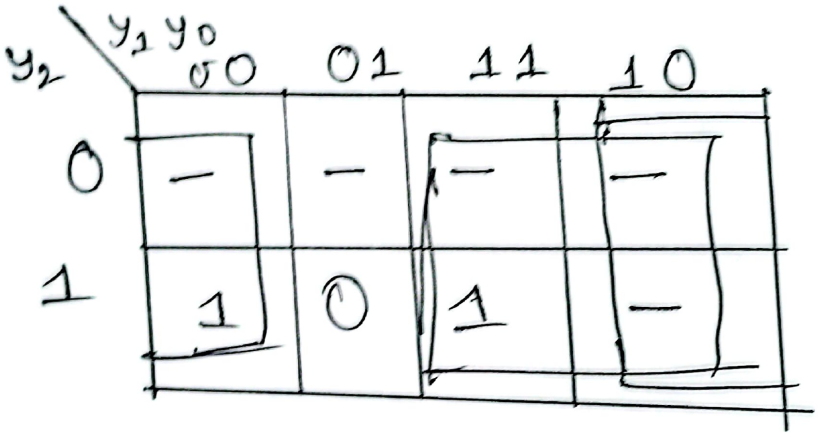
	J	K
0 → 0	0	–
0 → 1	1	–
1 → 0	–	1
1 → 1	–	0

K-MaP:

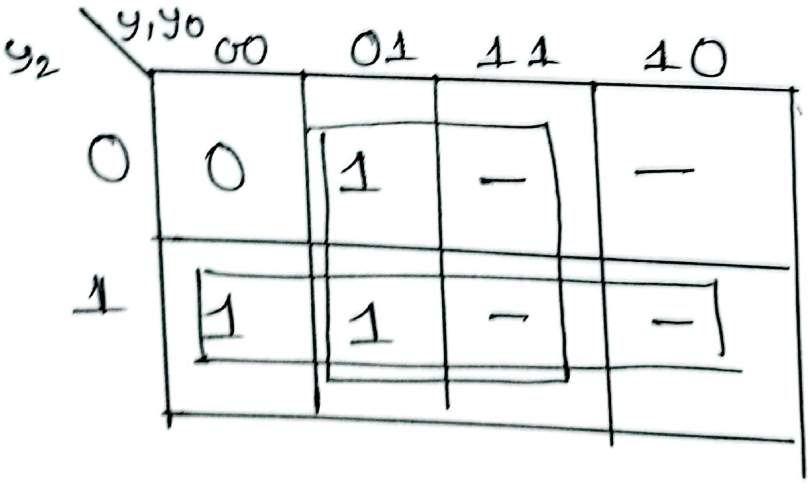
Number of FFs needed = $\lceil \log_2 7 \rceil = 3$.



$$J_2 = \bar{y}_1 \bar{y}_0 + y_1 y_0$$



$$K_2 = y_1 + \bar{y}_0$$



$$J_1 = y_2 + y_0$$

y_2 \ y_1y_0	00	01	11	10
0	—	—	1	1
1	—	—	1	—

$$K_1 = 1$$

y_2 \ y_1y_0	00	01	11	10
0	1	—	—	0
1	0	—	—	—

$$J_0 = \overline{y_2}\,\overline{y_1}$$

y_2 \ y_1y_0	00	01	11	10
0	—	0	1	—
1	—	0	0	—

$$K_0 = \overline{y_2}\,y_1$$