LAB 5

SEQUENTIAL CIRCUIT PROJECT

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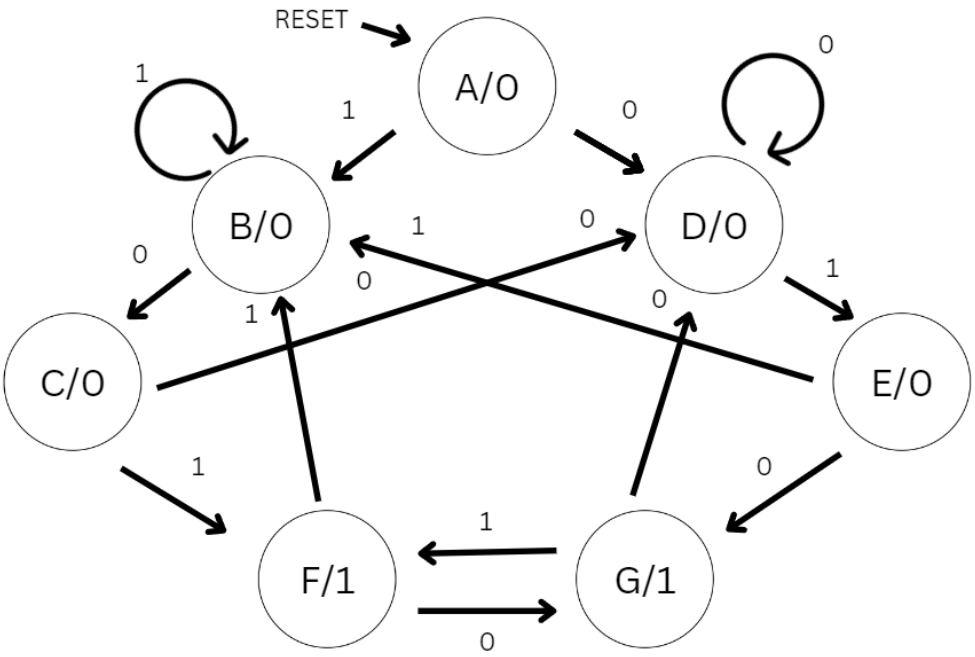
Kelas: PSD-C

1. Buat State Diagram dengan model Moore



2. Buat *state table* dengan menggunakan *binary counting order assignment*

Present State	*Next State*		*Output*
	X = 0	X = 1	
A	D	B	0
B	C	B	0
C	D	F	0
D	D	E	0
E	G	B	0
F	G	B	1
G	D	F	1

3. Lanjutkan dengan membuat tabel *input determination*

Present State			*Next State*						*Output*
			X = 0			X = 1			
Y2	Y1	Y0	D2	D1	D0	D2	D1	D0	Y
0	0	0	0	1	1	0	0	1	0
0	0	1	0	1	0	0	0	1	0
0	1	0	0	1	1	1	0	1	0
0	1	1	0	1	1	1	0	0	0
1	0	0	1	1	0	0	0	1	0
1	0	1	1	1	0	0	0	1	1
1	1	0	0	1	1	1	0	1	1
X	X	X	X	X	X	X	X	X	X

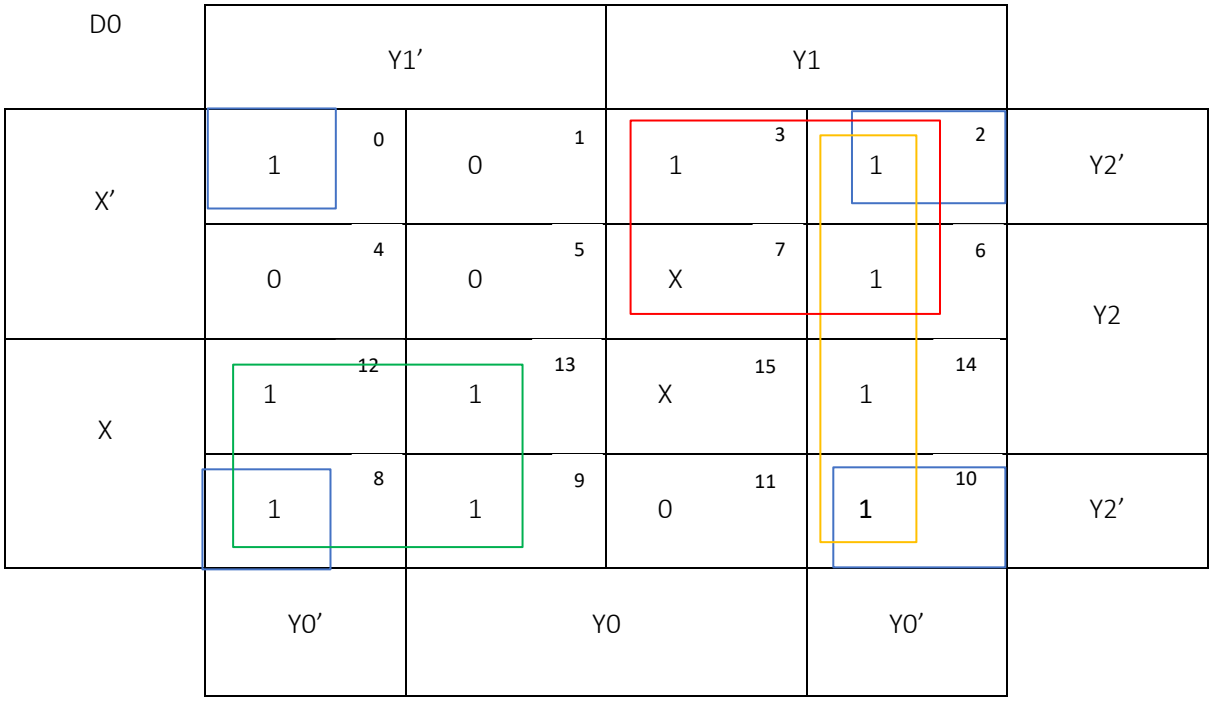
4. Cari formula outputnya dengan menggunakan K-Map

D2	Y1'		Y1		
X'	0 (0)	0 (1)	0 (3)	0 (2)	Y2'
	1 (4)	1 (5)	X (7)	0 (6)	Y2
X	0 (12)	0 (13)	X (15)	1 (14)	
	0 (8)	0 (9)	1 (11)	1 (10)	Y2'
	Y0'	Y0		Y0'	

Persamaan output D2 = (X'.Y1'.Y2) + (X.Y1)

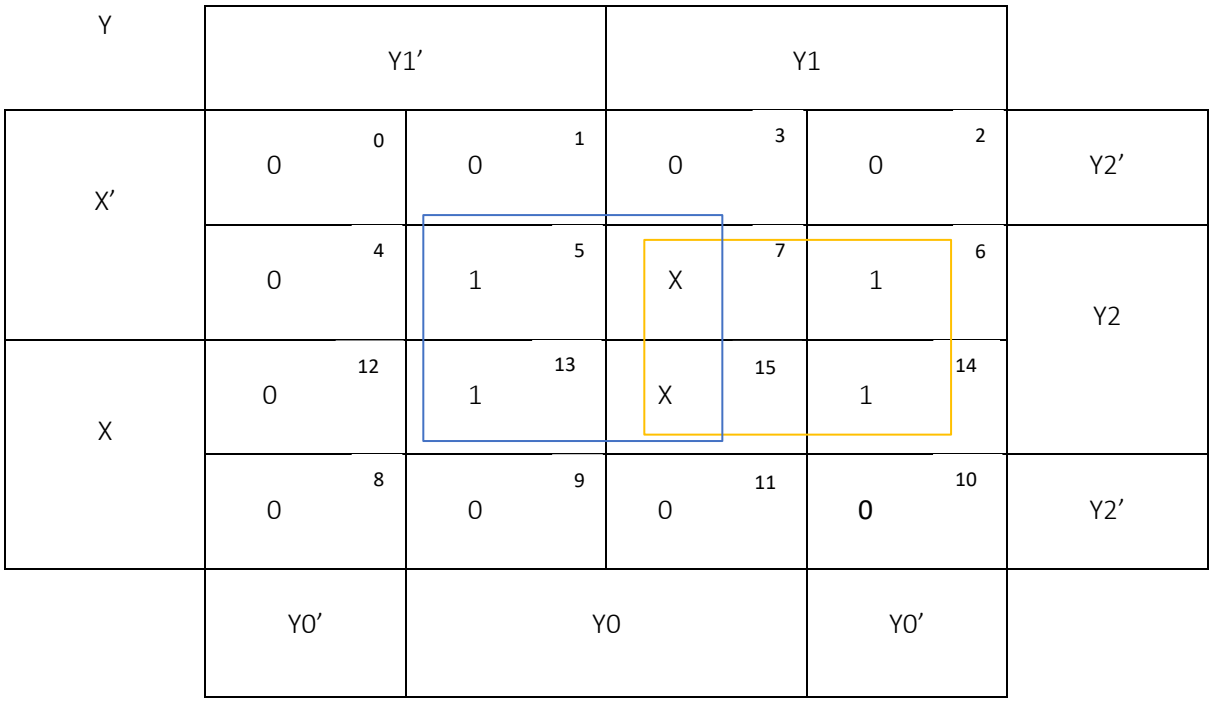
D1	Y1'		Y1		
X'	1 (0)	1 (1)	1 (3)	1 (2)	Y2'
	1 (4)	1 (5)	X (7)	1 (6)	Y2
X	0 (12)	0 (13)	X (15)	0 (14)	
	0 (8)	0 (9)	0 (11)	0 (10)	Y2'
	Y0'	Y0		Y0'	

Persamaan output D1 = X'



Persamaan Output D0 = (Y0'.Y2') + (X'.Y1) + (Y0'.Y1) + (X.Y1')

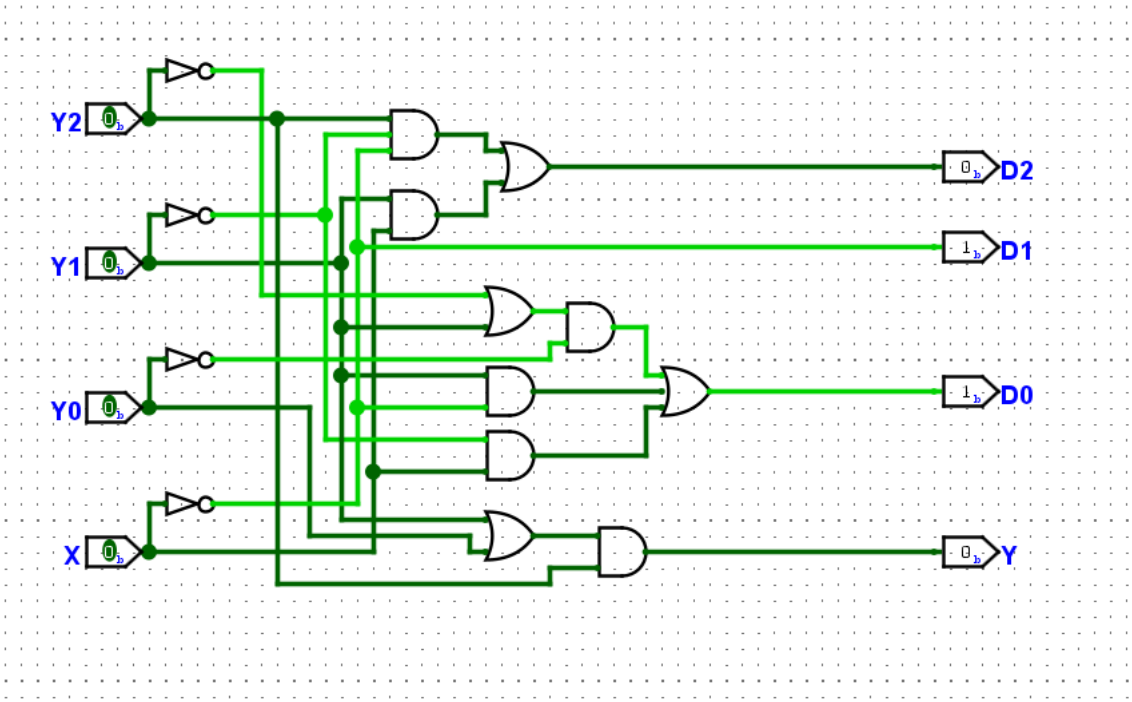
= Y0'(Y2'+Y1) + (X'.Y1) + (X.Y1')



Persamaan Output Y = (Y0.Y2) + (Y1.Y2)

= Y2(Y0 + Y1)

5. Buat combinational circuit dari yang sudah diperoleh



Truth Table

Y2	Y1	Y0	X	D2	D1	D0	Y
0	0	0	0	0	1	1	0
0	0	0	1	0	0	1	0
0	0	1	0	0	1	0	0
0	0	1	1	0	0	1	0
0	1	0	0	0	1	1	0
0	1	0	1	1	0	1	0
0	1	1	0	0	1	1	0
0	1	1	1	1	0	0	0
1	0	0	0	1	1	0	0
1	0	0	1	0	0	1	0
1	0	1	0	1	1	0	1
1	0	1	1	0	0	1	1
1	1	0	0	0	1	1	1
1	1	0	1	1	0	1	1
1	1	1	0	0	1	1	1
1	1	1	1	1	0	0	1

Persamaan *Circuit*

$$D2 = Y2 \cdot \overline{Y1} \cdot \overline{X} + Y1 \cdot X$$

$$D1 = \overline{X}$$

$$D0 = \overline{(Y2+Y1)} \cdot Y0 + Y1 \cdot \overline{X} + \overline{Y1} \cdot X$$

$$Y = (Y1+Y0) \cdot Y2$$

6. Buat sequential circuitnya dengan memanfaatkan combinational circuit sebelumnya