

Lecture # 13.

#

 $0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 0$

P.S.

N.S.

0 0

0 1

0 1

1 0

1 0

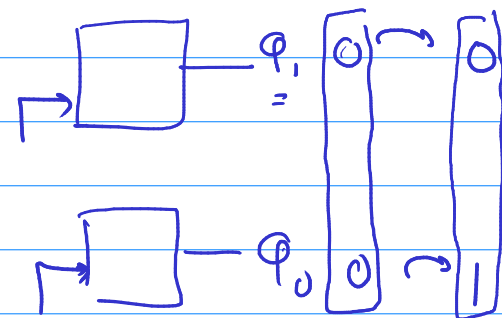
1 1

1 1

0 0

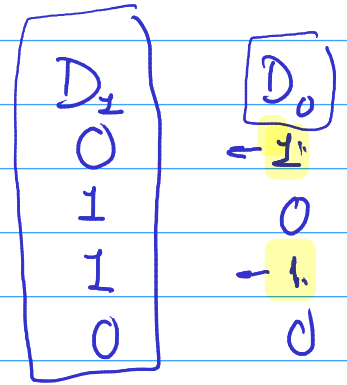
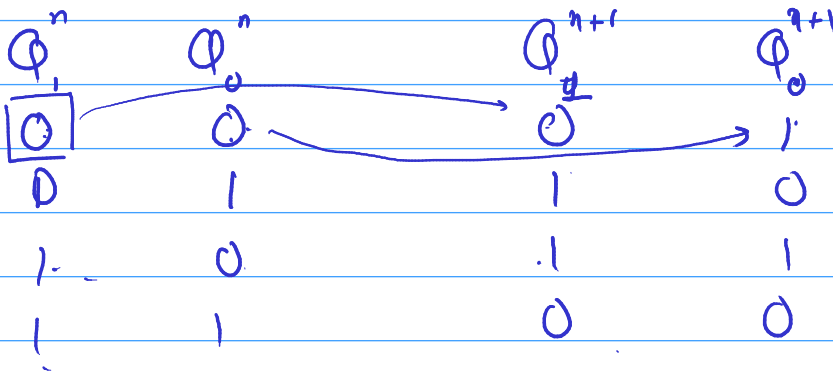
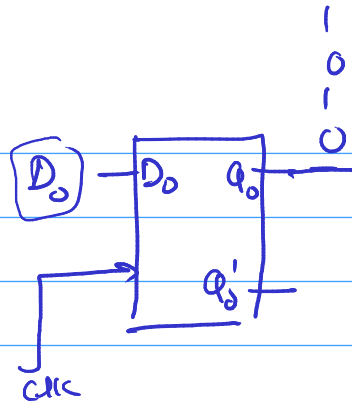
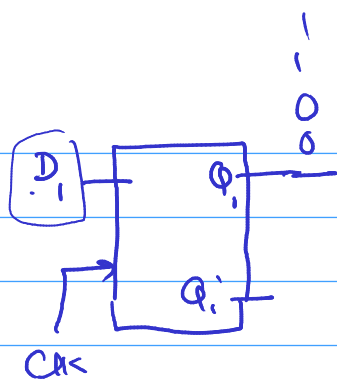
$$\begin{array}{cc} \boxed{\phi_1^n} & \phi_0^n \\ 0 & 0 \\ 0 & 1 \\ 1 & 0 \\ 1 & 1 \end{array}$$

$$\begin{array}{cc} \phi_1^{n+1} & \phi_0^{n+1} \\ \boxed{0} & 1 \\ 1 & 0 \\ 1 & 1 \\ 0 & 0 \end{array}$$



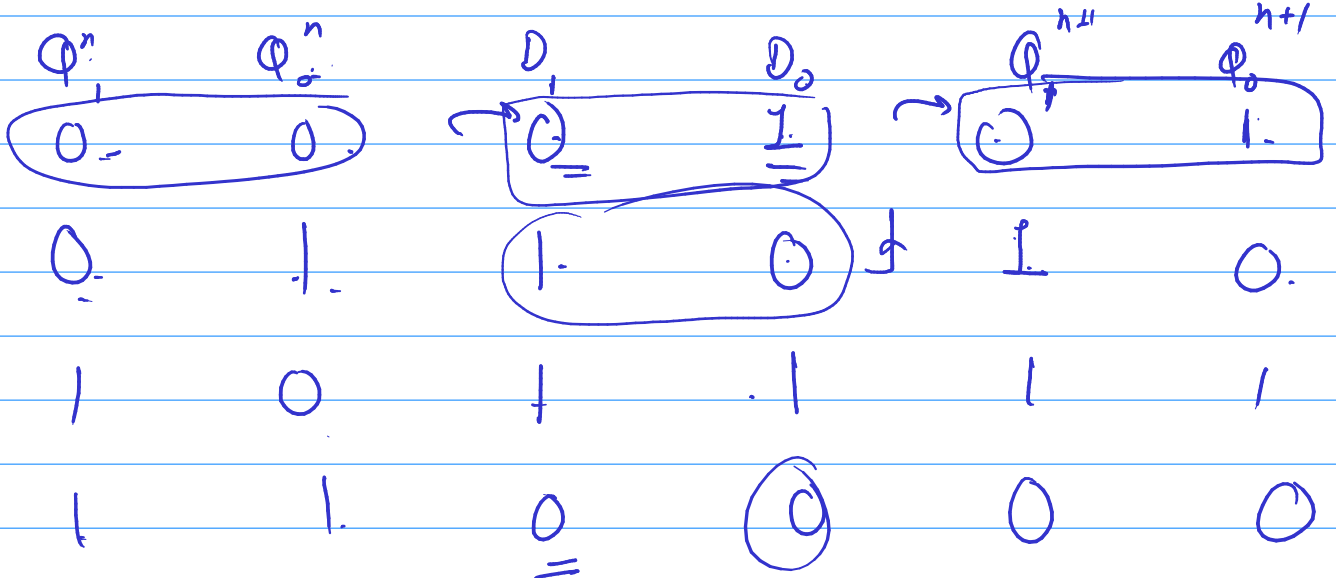
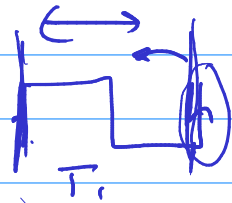
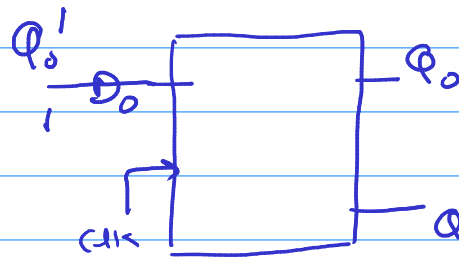
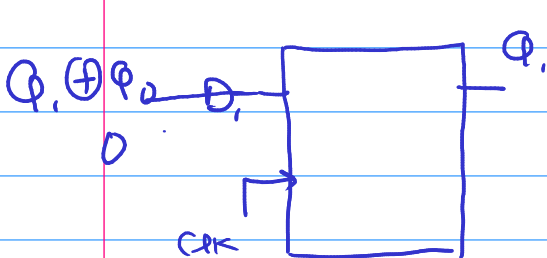
$$\begin{array}{ccc} \phi_n & \rightarrow & \phi_{n+1} \\ 0 & \rightarrow & 0 \\ 0 & \rightarrow & 1 \\ 1 & \rightarrow & 0 \\ 1 & \rightarrow & 1 \end{array}$$

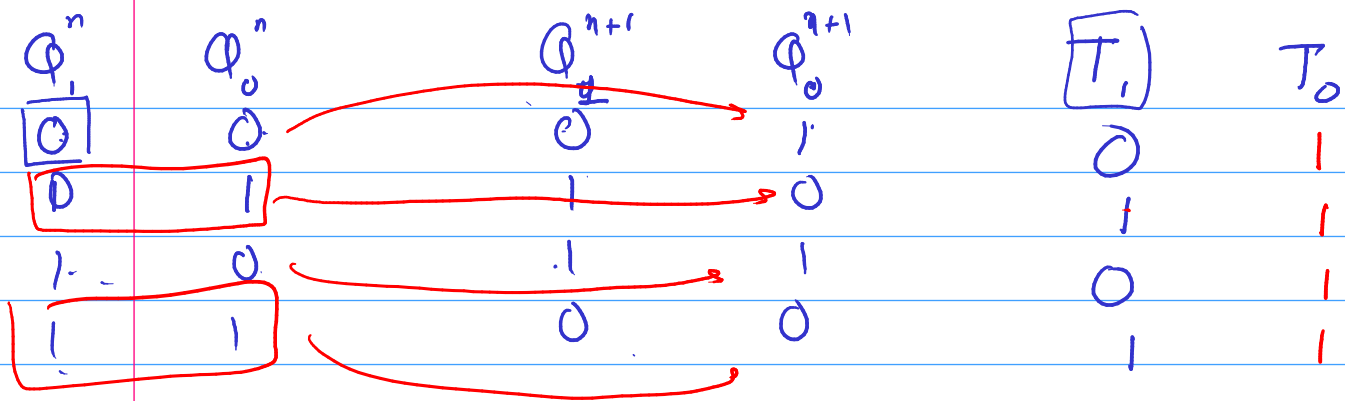
$$\begin{array}{ccc} \phi_n & \rightarrow & \phi_{n+1} \\ 0 & \rightarrow & 0 \\ 0 & \rightarrow & 1 \\ 1 & \rightarrow & 0 \\ 1 & \rightarrow & 1 \end{array}$$



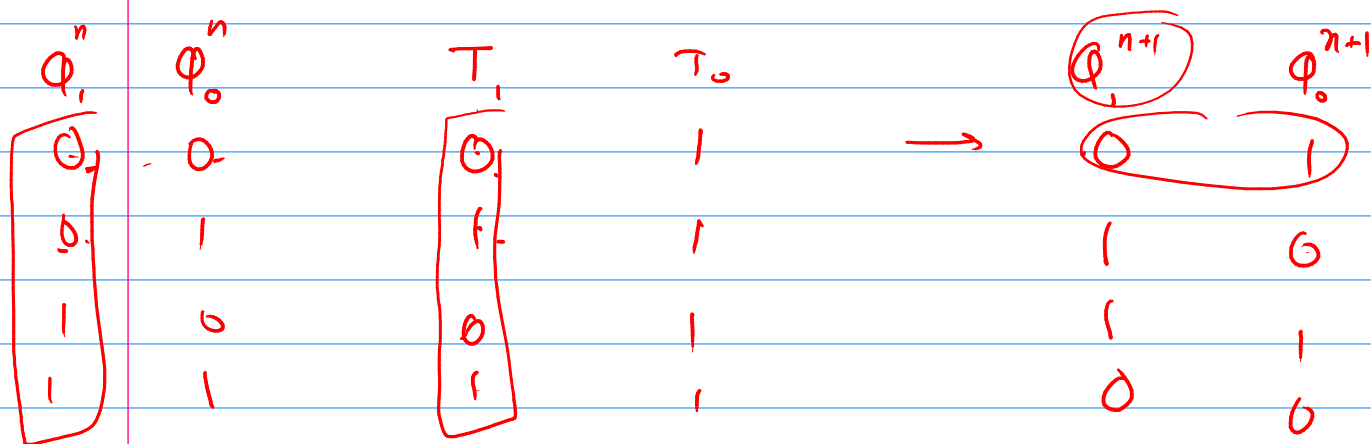
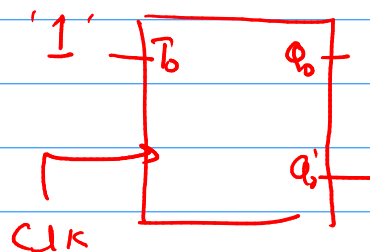
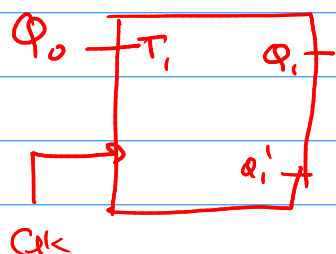
$$D_1 = Q_1 \oplus Q_0$$

$$D_0 = Q_0'$$





$$T_1 = Q_0 \quad T_0 = 1$$



$$0 \rightarrow 3 \rightarrow 5 \rightarrow 2 \rightarrow 6 \rightarrow 7 \rightarrow 1 \rightarrow 4 \rightarrow 0$$

	φ_2^n	φ_1^n	φ_0^n		φ_2^{n+1}	φ_1^{n+1}	φ_0^{n+1}	D_2	D_1	D_0
0	0	0	0	—	0	1	1	0	1	1
1	0	0	1	—	1	0	0	1	0	0
2	0	1	0	—	1	1	0	1	1	0
3	0	1	1	→	1	0	1	1	0	1
4	1	0	0	→	0	0	0	0	0	0
5	1	0	1	→	0	1	0	0	1	0
6	1	1	0	→	1	1	1	1	1	1
7	1	1	1	→	0	0	1	0	0	1

$$D_2 = f(\varphi_2 \ \varphi_1 \ \varphi_0) = \varphi_2' \varphi_0 + \varphi_1 \varphi_0'$$

$$D_1 = f(\varphi_2 \ \varphi_1 \ \varphi_0) =$$

$$D_0 = f(\varphi_2 \ \varphi_1 \ \varphi_0) =$$

	Q_2^n	Q_2^{n+1}	Q_0^n		Q_2^{n+1}	Q_1^{n+1}	Q_0^{n+1}	D_2	D_1	D_0
0	0	0	0	—	0	1	1	0	1	1
1	0	0	1	—	1	0	0	1	0	0
2	0	1	0	—	1	1	0	1	1	0
3	0	1	1	→	1	0	1	1	0	1
4	1	0	0	→	0	0	0	0	0	0
5	1	0	1	→	0	1	0	0	1	0
6	1	1	0	→	1	1	1	1	1	1
7	1	1	1	→	0	0	1	0	0	1

Q_1

	000	001	011	010
Q_2'	0	1	1	1
Q_2	0	0	0	1

Q_0

$$D_2 = Q_1 Q_0' + Q_2' Q_0$$

Q_1

	000	001	011	010
Q_2'	1	0	0	1
Q_2	0	1	0	1

Q_0

$$D_1 = Q_1 Q_0' + Q_2' Q_0' + Q_0 Q_2 Q_1'$$

~~5~~
4

~~3~~
2

$D_0 = ?$

0 1 2 7 0

1 1 0

0

1

2

7

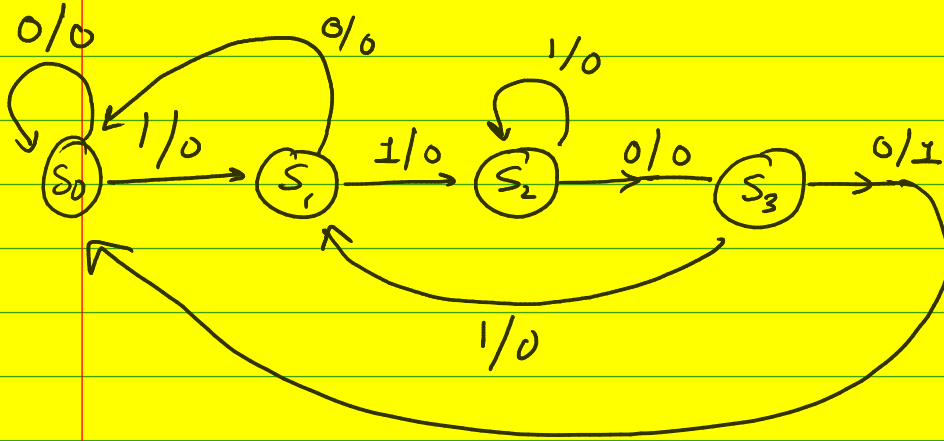
0

	Q_2^n	Q_1^n	Q_0^n	Q_2^{n+1}	Q_1^{n+1}	Q_0^{n+1}	J_2	K_2	J_1	K_1	J_0	K_0
0	0	0	0	0	0	1						
1	0	0	1	0	1	0						
2	0	1	0	1	1	1						
3	0	1	1	0	0	0						
4	1	0	0	0	0	0						
5	1	0	1	0	0	0						
6	1	1	0	0	0	0						
7	1	1	1	0	0	0						

	Q_2^n	Q_2^{n+1}	Q_1^n	Q_1^{n+1}	Q_0^n	Q_0^{n+1}	J_2	K_2	J_1	K_1	J_0	K_0
0	0	→ 0	0	→ 0	0	→ 1	0	x	0	x	1	x
1	0	→ 0	0	→ 1	1	→ 0	0	x	1	x	x	1
2	0	→ 1	1	→ 1	0	→ 1	1	x	x	0	1	x
3	0	→ 0	1	→ 0	1	→ 0	0	x	x	1	x	1
4	1	→ 0	0	→ 0	0	→ 0	x	1	0	x	0	x
5	1	→ 0	0	→ 0	1	→ 0	x	1	0	x	x	1
6	1	→ 0	1	→ 0	0	→ 0	x	1	x	1	0	x
7	1	→ 0	1	→ 0	1	→ 0	x	1	x	1	x	1

$$K_0 = 1$$

1 1 0 0



$S_0 \rightarrow \infty$

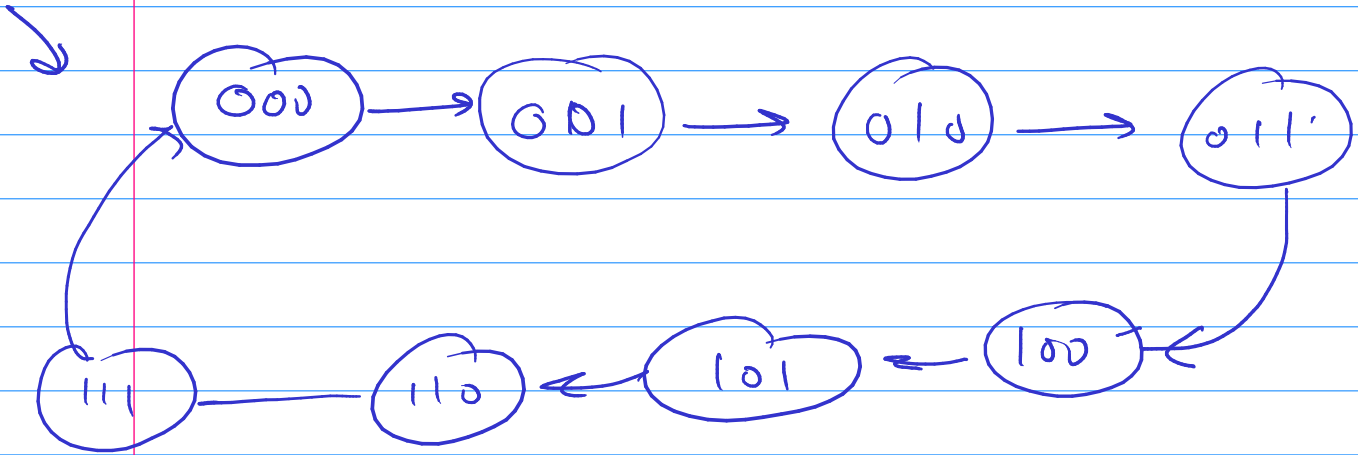
$S_1 \rightarrow 1$

$S_2 = 111$

$S_3 = 110$

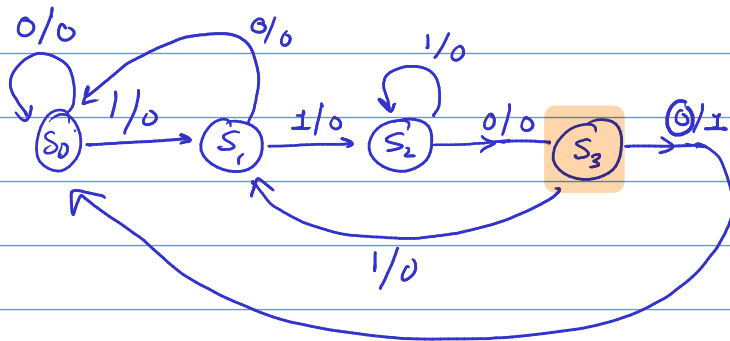
1101

1100



$$N.s = f(P.s, i/p)$$

1 1 0 0



$S_0 \rightarrow 00$

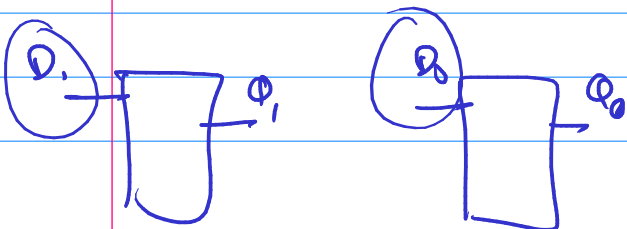
$S_1 \rightarrow 01$

$S_2 \rightarrow 10$

$S_3 \rightarrow 11$

i/p	P.S	N.S	o/p
0	$S_0 \rightarrow$	S_0	0
1	$S_0 \rightarrow$	S_1	0
0	$S_1 \rightarrow$	S_0	0
1	$S_1 \rightarrow$	S_2	0
0	$S_2 \rightarrow$	S_3	0
1	$S_2 \rightarrow$	S_2	0
0	$S_3 \rightarrow$	S_0	1
1	$S_3 \rightarrow$	S_1	0

i/p	P.S	N.S	o/p	Q_1^n, Q_0^n	$\rightarrow Q_1^{n+1}, Q_0^{n+1}$	o/p
0	$S_0 \rightarrow$	S_0	0	0 0	$\rightarrow 0, 0$	0
1	$S_0 \rightarrow$	S_1	0	0 0	$\rightarrow 0, 1$	0
0	$S_1 \rightarrow$	S_0	0	0 1	$\rightarrow 0, 0$	0
1	$S_1 \rightarrow$	S_2	0	0 1	$\rightarrow 1, 0$	0
0	$S_2 \rightarrow$	S_3	0	1 0	$\rightarrow 1, 1$	0
1	$S_2 \rightarrow$	S_2	0	1 0	$\rightarrow 1, 0$	0
0	$S_3 \rightarrow$	S_0	1	1 1	$\rightarrow 0, 0$	1
1	$S_3 \rightarrow$	S_1	0	1 1	$\rightarrow 0, 1$	0



$$Q_1 = f(Q, Q_0, x)$$

$$Q_0 = f(Q, Q_0, x)$$

i/p	P.S	N.S	o/p	Q_1, Q_0	$\rightarrow Q_1$	Q_0	o/p	D_1	D_0
0	<u>S_0</u>	S_0	0	<u>0</u> 0	\rightarrow 0	0	\rightarrow 0	0	0
1	S_0	S_1	0	0 <u>0</u>	\rightarrow 0	1	\rightarrow 0	1	1
0	S_1	S_0	0	0 1	\rightarrow 0	0	\rightarrow 0	0	0
1	S_1	S_2	0	0 1	\rightarrow 1	0	\rightarrow 0	1	0
0	S_2	S_3	0	1 0	\rightarrow 1	1	\rightarrow 0	1	1
1	S_2	S_2	0	1 0	\rightarrow 1	0	\rightarrow 0	1	0
0	<u>S_3</u>	S_0	1	<u>1</u> 1	\rightarrow 0	0	\rightarrow 1 \leftarrow	0	0
1	S_3	S_1	0	1 1	\rightarrow 0	1	\rightarrow 0	0	1

Q_1	0	0	1	0
Q_0	1	1	0	0

x

$$D_1 = Q_1 Q_0' + Q_0 \times Q_1'$$

$$D_0 = Q_0' Q_1' x + Q_1 Q_0' x' + Q_1 Q_0 x$$

$$O/p = Q_1 Q_0 x'$$