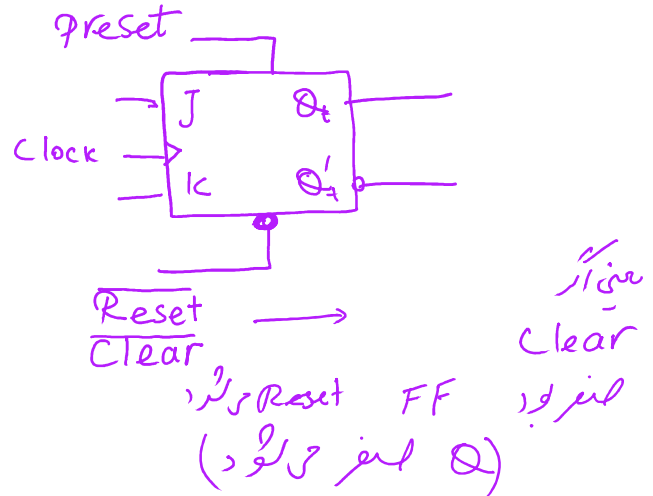
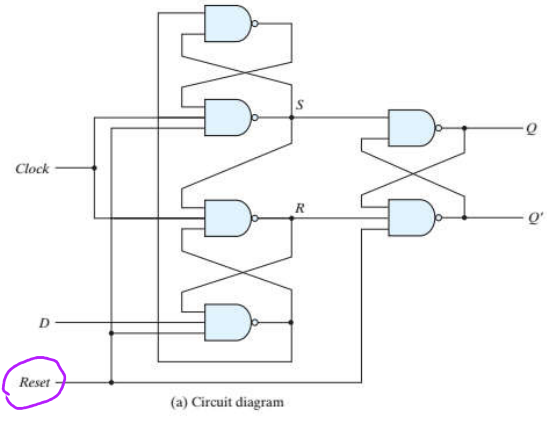


# Sequential Circuit Analysis

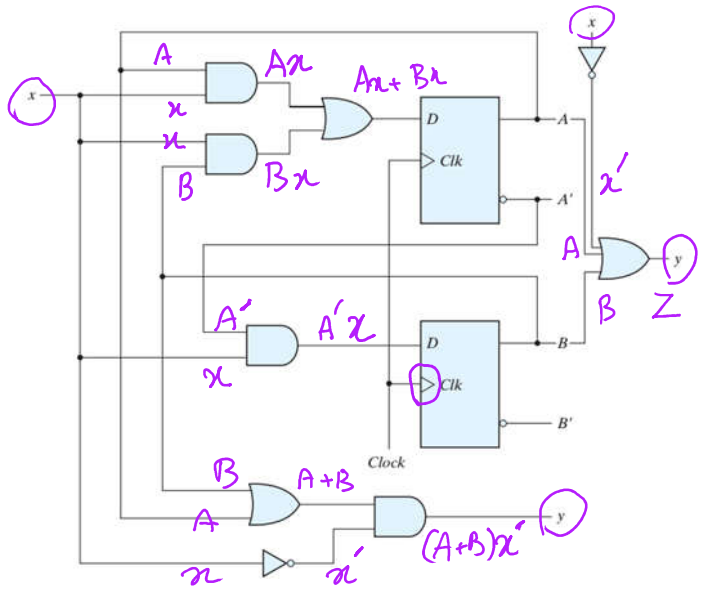
Tuesday, May 5, 2020 3:57 PM

S	R	$Q_{t+1}$	J	K	$Q_{t+1}$	T	$Q_{t+1}$
0	0	$Q_t$	0	0	$Q_t$	0	$Q_t$
0	1	0	0	1	0	1	$Q_t'$
1	0	1	1	0	1	0	$Q_t'$
1	1	غیرباز	1	1	$Q_t'$	1	$Q_t$

$D \quad Q_{t+1} = D$   
 $JK \quad Q_{t+1} = JQ_t' + K'Q_t$   
 $T \quad Q_{t+1} = T \oplus Q_t$



(پست ریست  $Q = 1$ ) preset  
 (ورودی های آسنکرون)



ورودی $x$	$A_t$	$B_t$	خروجی $A_{t+1}$	خروجی $B_{t+1}$	$y$	$Z$
0	0	0	0	0		
0	0	1	0	1		
0	1	0	1	0		
1	0	0	0	1		
1	1	0	1	1		
1	1	1	0	0		

State Table جدول حالات

$D_A = A \oplus B = (A+B) \cdot x$   
 $D_B = A \oplus B'$

$D_A = A\alpha + B\alpha = (A+B)\alpha$   
 $D_B = A'\alpha$   
 $y = (A+B)\alpha'$   
 $z = (\alpha' + A + B)$

$A_{t+1} = D_A = (A_t + B_t)\alpha$   
 $B_{t+1} = D_B = A_t'\alpha$

$\alpha$	$A_t$	$B_t$	$A+B$	$A_{t+1} = (A+B)\alpha$	$B_{t+1} = A'\alpha$	$y = (A+B)\alpha'$	$z = (A+B)\alpha'$
0	0	0	0	0	0	0	1
0	0	1	1	0	0	1	1
0	1	0	1	0	0	1	1
0	1	1	0	0	0	1	1
1	0	0	0	0	1	0	0
1	0	1	1	0	1	0	0
1	1	0	1	0	1	0	0
1	1	1	0	0	1	0	0

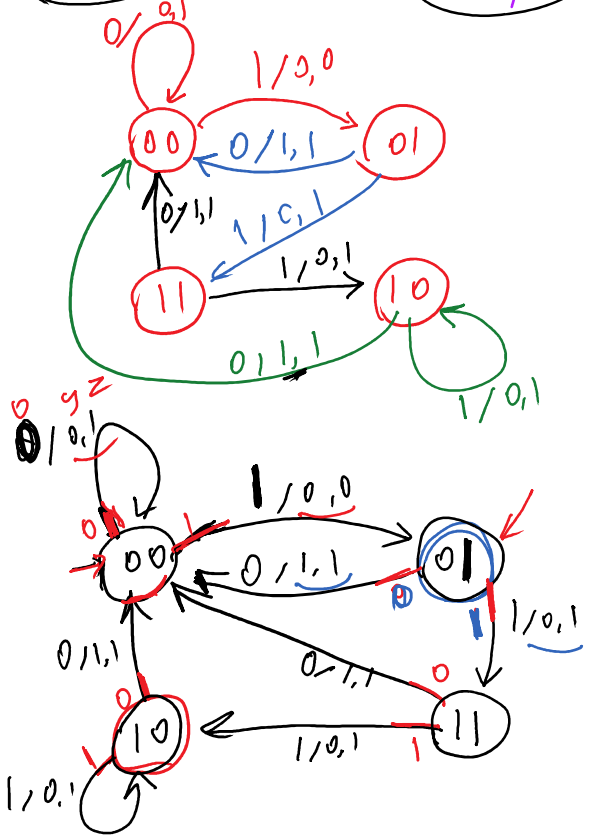
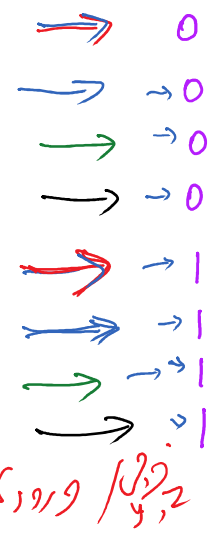
State-Table

صورت  
نوع

دیاگرام حالت  
State Diagram

FF 2,2

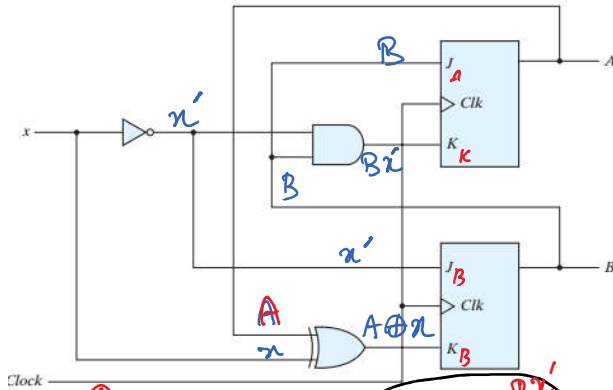
00  
01  
10  
11



$\alpha$	$A_t$	$B_t$	$A_{t+1}$	$B_{t+1}$	$y$	$z$
0	0	0	0	0	0	1
0	0	1	0	0	1	1
0	1	0	0	0	1	1
0	1	1	0	0	1	1
1	0	0	0	1	0	0
1	0	1	0	1	0	0
1	1	0	0	1	0	0
1	1	1	0	1	0	0

$\alpha=0$		$\alpha=1$		$\alpha=0$		$\alpha=1$	
$A_t$	$B_t$	$A_{t+1}$	$B_{t+1}$	$A_{t+1}$	$B_{t+1}$	$y$	$z$
0	0	0	0	0	0	0	1
0	1	0	0	0	0	1	1
1	0	0	0	0	1	0	0
1	1	0	0	0	1	0	0

0	0	0	0	0	0
0	0	0	0	1	0
0	1	1	1	1	0
1	0	1	1	1	0
1	1	1	1	1	1



$$\begin{cases} J_A = B_t \\ K_A = B_t x' \end{cases} \quad \begin{cases} J_B = x' \\ K_B = A_t \oplus x \end{cases}$$

$A_{t+1} = ?$        $B_{t+1} = ?$

$x$	$A_t$	$B_t$	$J_A$	$K_A$	$J_B$	$K_B$	$A_{t+1}$	$B_{t+1}$
0	0	0	0	0	1	0	0	1
0	0	1	1	1	1	0	1	1
0	1	0	0	0	1	1	1	1
0	1	1	1	1	1	0	1	1
1	0	0	0	0	0	1	0	0
1	0	1	1	1	0	1	1	0
1	1	0	0	0	0	1	1	0
1	1	1	1	1	0	0	1	1

J	K	$Q_{t+1}$
0	0	$Q_t$
0	1	0
1	0	1
1	1	$Q_t'$

D	$Q_{t+1}$
0	0
1	1

$Q_{t+1} = D$

$$\begin{cases} J_A = B_t \\ K_A = B_t x' \end{cases} \quad \begin{cases} J_B = x' \\ K_B = A_t \oplus x \end{cases}$$

$$Q_{t+1} = J Q_t' + K' Q_t$$

$$A_{t+1} = \bar{J}_A A_t' + K_A' A_t$$

$$A_{t+1} = B_t \cdot A_t' + (B_t x') A_t$$

$$A_{t+1} = B A' + (B' + x) A$$

$$= \underbrace{A'B + AB'}_{A_{t+1}} + Ax = A \oplus B + Ax$$

$$B_{t+1} = \bar{J}_B B_t' + K_B' B_t$$

$$B_{t+1} = x' B_t' + (A_t \oplus x) B_t$$

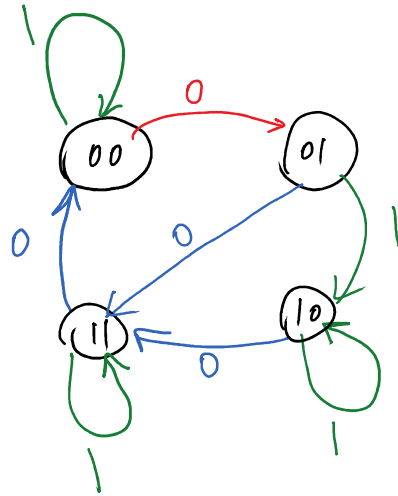
$$B_{t+1} = x' B' + (A \oplus x) B$$

$$B_t = B x' + (A x' + A x) B$$

$$= \underbrace{A'B + AB + \dots}_{A_{t+1}} = \dots$$

$x$	A	B	$A \oplus B$	$Ax$	$(A \oplus B) + Ax$	$B'x'$	$A \oplus x$	$(A \oplus x)B$	$x'B' + (A \oplus x)B$
0	0	0	0	0	0	1	1	0	1

$x$	A	B	$A_{t+1}$	$B_{t+1}$
0	0	0	0	1
0	0	1	1	1
0	1	0	1	1
0	1	1	0	0
1	0	0	0	0
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1



$\overline{F} \overline{F} \overline{b_2}$   
 00  
 01  
 10  
 11