Lezione 18

Esercizio , Contatore sincrono, FF con ingressi asincroni (set & clear)

Esercizio , Contatore sincrono, FF con ingressi asincroni (set & clear)

Es. 4 3/7/2019

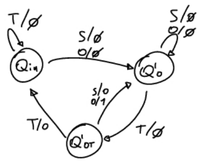
input O, S, T

riconosce STO, OTO
con eventuali sovrapposizioni
→ produce in uscita

	O	S	T
Q_{in}	$Q_O/0$	$Q_S/0$	$Q_{in}/0$
Q_O	$Q_O/0$	$Q_S/0$	$Q_{OT}/0$
Q_S	$Q_O/0$	$Q_S/0$	$Q_{ST}/0$
Q_{OT}	$Q_O/1$	$Q_S/0$	$Q_{in}/0$ •
Q_{ST}	$Q_O/1$	$Q_S/0$	$Q_{in}/0$ •

Q_O	in OT			
Q_S	in ST	OT ST		
Q_{OT}	X	X	X	
Q_{ST}	X	X	X	
	Q_{in}	Q_O	Q_S	Q_{OT}

	O	S	T
Q_{in}	$Q'_O/0$	$Q'_O/0$	$Q_{in}/0$
Q'_O	$Q'_O/0$	$Q'_O/0$	$Q'_{OT}/0$
Q'_{OT}	$Q'_O/1$	$Q'_O/0$	$Q_{in}/0$



Q_{in} $Q'_O = \{Q_O, Q_S\}$
$Q'_{OT} = \{Q_{OT}, Q_{ST}\}$

	$y_1 y_0$
Q_{in} =	00
Q'_O =	01
Q'_{OT} =	10

	$x_1 x_0$
O =	00
S =	01
T =	10

$x_1 x_0 y_1 y_0$	$Y_1 Y_0$	Z	$s\ r$	t
0 0 0 0	0 1	0	0 δ	1
0 0 0 1	0 1	0	0 δ	0
0 0 1 0	0 1	0	0 1	1
0 0 1 1	δ δ	δ	δ δ	δ
0 1 0 0	0 1	0	0 δ	1
0 1 0 1	0 1	0	0 δ	0
0 1 1 0	0 1	0	0 1	1
0 1 1 1	δ δ	δ	δ δ	δ
1 0 0 0	0 0	0	0 δ	0
1 0 0 1	1 0	0	1 0	1
1 0 1 0	0 0	0	0 1	0
1 0 1 1	δ δ	δ	δ δ	δ
1 1 0 0	δ	δ	δ	δ
1 1 0 1				
1 1 1 0				
1 1 1 1				

S

$x_1x_0 \backslash y_1y_0$	00	01	11	10
00	0	0	δ	0
01	0	0	δ	0
11	δ	δ	δ	δ
10	0	1	δ	0

$S = x_1 y_0$

r

$x_1x_0 \backslash y_1y_0$	00	01	11	10
00	δ	δ	δ	1
01	δ	δ	δ	1
11	δ	δ	δ	δ
10	δ	0	δ	1

$r = y_1$ oppure $\overline{y_0}$

t

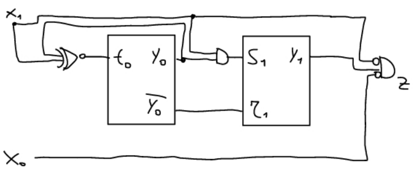
$x_1x_0 \backslash y_1y_0$	00	01	11	10
00	1	0	δ	1
01	1	0	δ	1
11	δ	δ	δ	δ
10	0	1	δ	0

$t = x_1 y_0 + \overline{x_1}\,\overline{y_0} = \overline{x_1 \oplus y_0}$

z

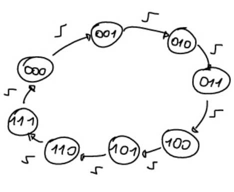
$x_1x_0 \backslash y_1y_0$	00	01	11	10
00	0	0	δ	1
01	0	0	δ	0
11	δ	δ	δ	δ
10	0	0	δ	0

$z = \overline{x_1}\,\overline{x_0}\, y_1$



- Contatore Sincrono

Mod 2^n

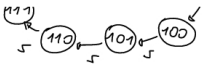


(x)	$y_2 y_1 y_0$	$Y_2 Y_1 Y_0$	$J_2 K_2$	$J_1 K_1$	$J_0 K_0$
1	0 0 0	0 0 1	0 δ	0 δ	1 δ
1	0 0 1	0 1 0	0 δ	1 δ	δ 1
1	0 1 0	0 1 1	0 δ	δ 0	1 δ
1	0 1 1	1 0 0	1 δ	δ 1	δ 1
1	1 0 0	1 0 1	δ 0	0 δ	1 δ
1	1 0 1	1 1 0	δ 0	1 δ	δ 1

$y_2 \backslash y_1 y_0$	00	01	11	10
0	0	0	1	0
1	δ	δ	δ	δ

$J_0 = K_0 = 1 = x$

$J_1 = K_1 = y_0 = x\,y_0$



1	011	100	1 δ	δ 1	δ1
1	100	101	δ 0	0 δ	1 δ
1	101	110	δ 0	1 δ	δ1
1	110	111	δ 0	δ 0	1 δ
1	111	000	δ 0	δ 1	δ1

$J_0 = K_0 = 1 = X$

$J_1 = K_1 = Y_0 = X Y_0$

$J_2 = K_2 = Y_1 Y_0 = X Y_1 Y_0$

Mod 2^n → n FF SR o T

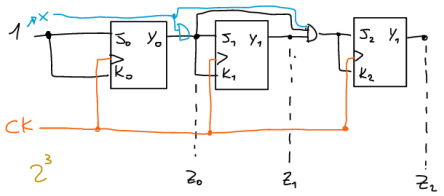
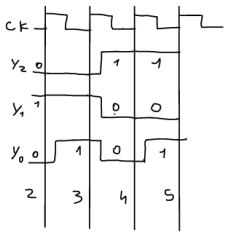
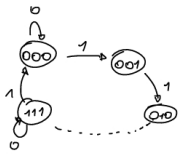
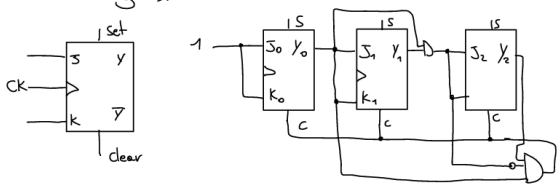


Diagramma temporale





- FF con ingressi asincroni Set e Clear



- PER CASA

  - Riconoscere di STO e OTO con codifiche diverse per stati e ingressi

  - Contatore mod 6 senza ingressi asincroni di 1 su una linea di ingressi