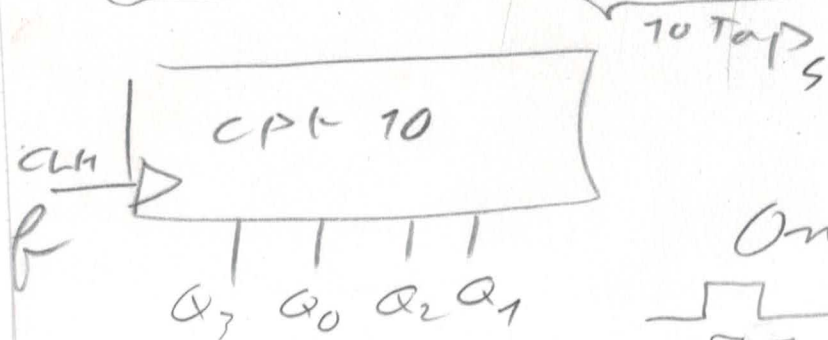
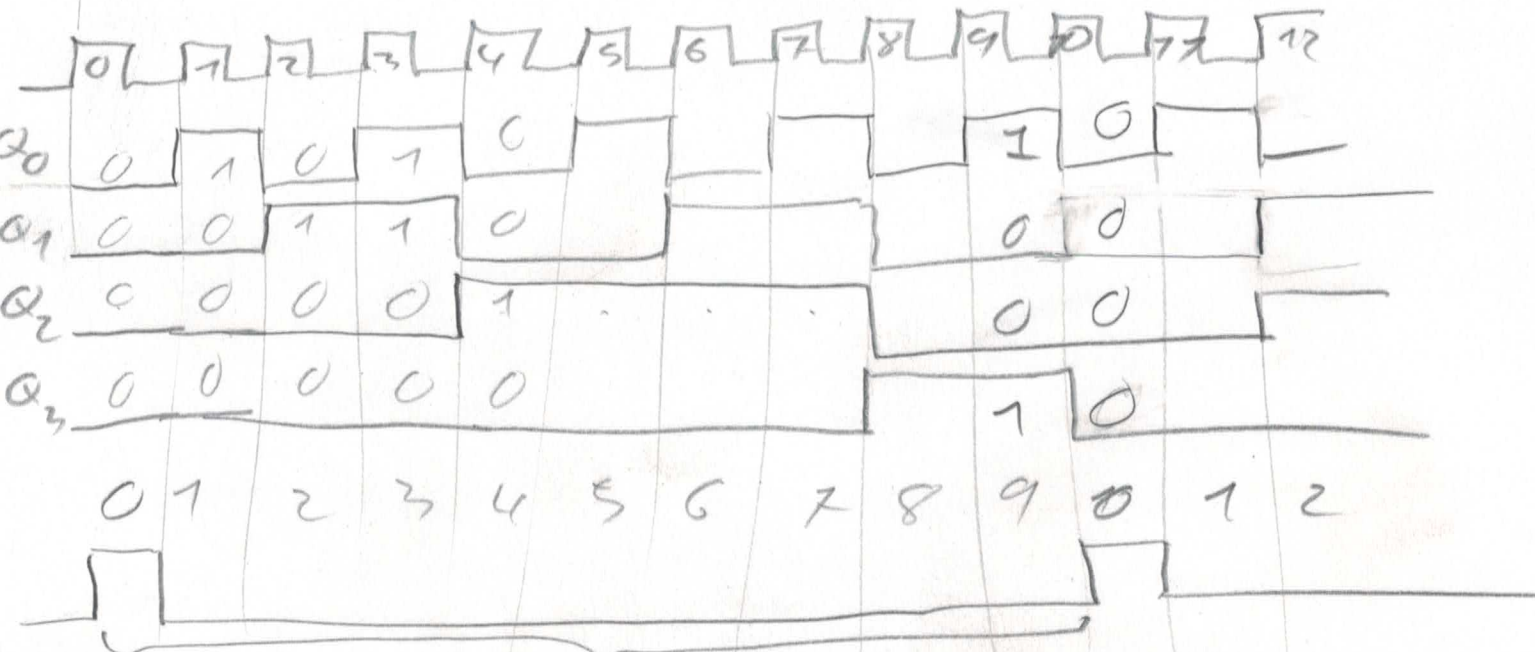


Compteur synchrone

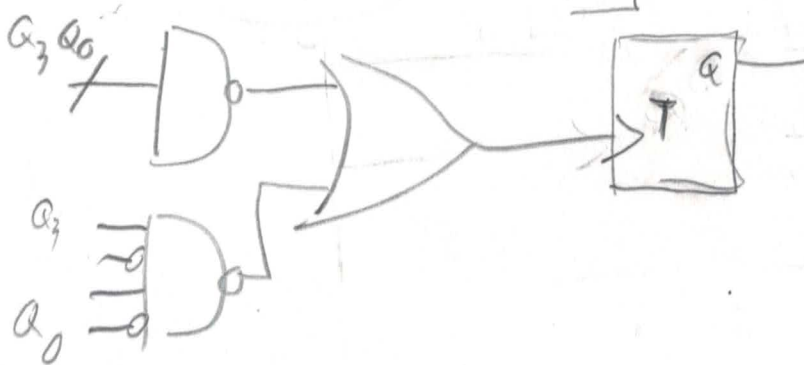
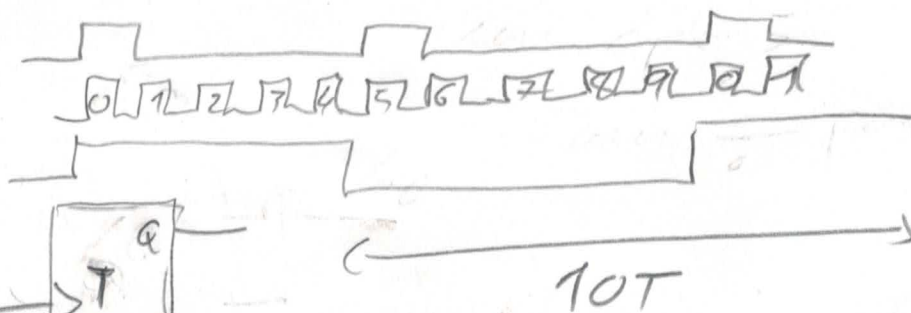
01/10/2019

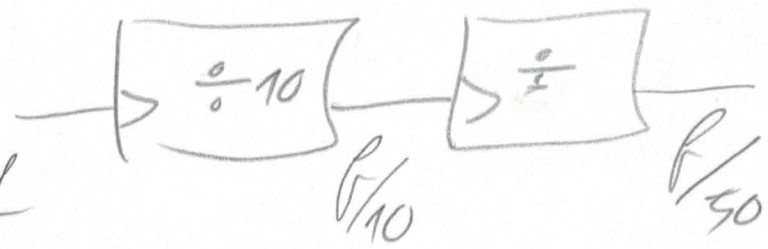
①

a) $10 = 0 \times 10 = 1010_b \Rightarrow$ Il faut 4 bits

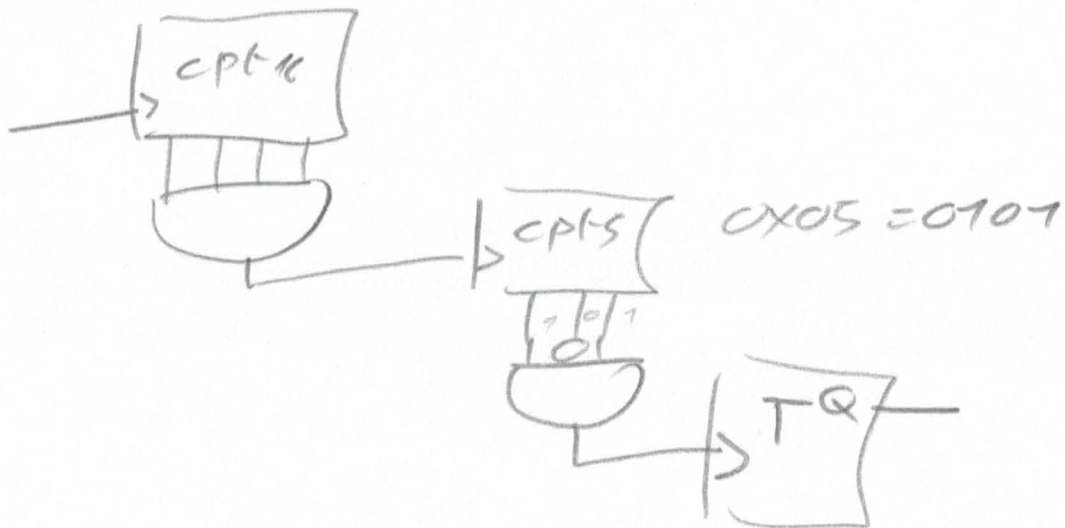


On décode les états 0 et 3





ou de façon approfondie



(3)

Tableau des Transitions

	Q_3	Q_2	Q_1	Q_0	$J_0 K_0$	$J_1 K_1$	$J_2 K_2$	$J_3 K_3$
0	0	0	0	0	1	0	0	0
1	0	0	0	1	1	1	0	0
2	0	0	1	0	1	0	0	0
3	0	0	1	1	1	1	1	0
4	0	1	0	0		0	0	0
5	0	1	0	1		1	0	0
6	0	1	1	0		0	0	0
7	0	1	1	1		1	1	1
8	1	0	0	0		0	0	0
9	1	0	0	1		0	0	1
10	0	0	0	0		0	0	0

Tabelleau $J_1 K_1$

(4)

$Q_1 Q_0$ $Q_3 Q_2$	00	01	11	10
00	0X	1X	X1	X0
01	0X	1X	X1	X0
11	XX			
10	0X	0X		

$$J_1 = Q_3 \bar{Q}_0$$

$$K_1 = Q_0$$

Plus

$$K_1 = Q_3 \bar{Q}_0$$

marche
aussi.

Tabelleau $J_2 K_2$

$Q_1 Q_0$ $Q_2 Q_1$	00	01	11	10
00	0X	0X	1X	0X
01	X0	X0	X1	X0
11				
10	0X	0X		

$$J_2 = Q_1 Q_0$$

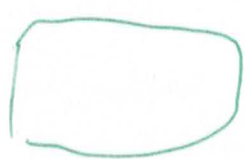
$$K_2 = Q_1 Q_0$$

Tableau $I_3 k_3$

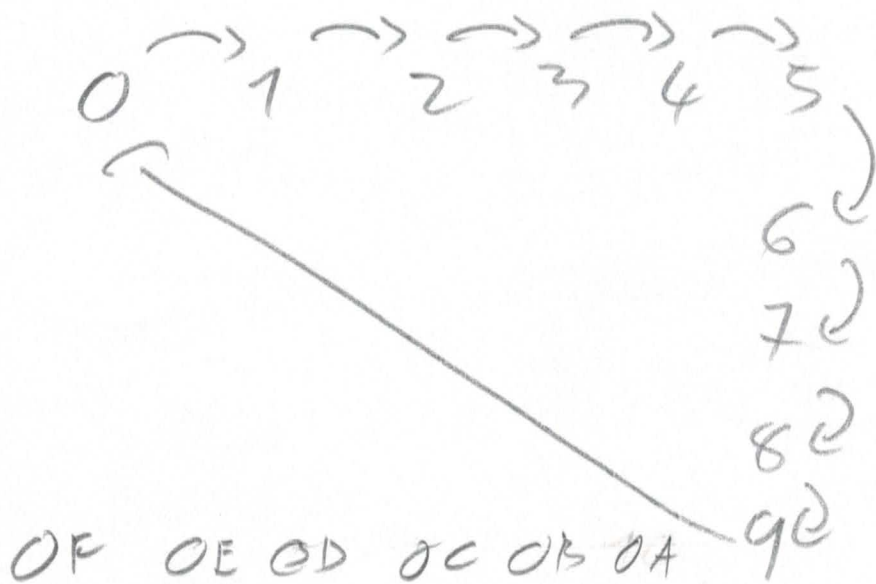
(5)

$Q_1 Q_0$	00	01	11	10	$I_3 = Q_2 Q_1 Q_0$ $k_3 = Q_0$
$Q_3 Q_2$					
00	0X	0X	0X	0X	
01	0X	0X	1X	0X	
11					
10	X0	X1			

La solution $I_3 = k_3 = Q_2 Q_1 Q_0 + Q_3 Q_0$

 +  est compatible

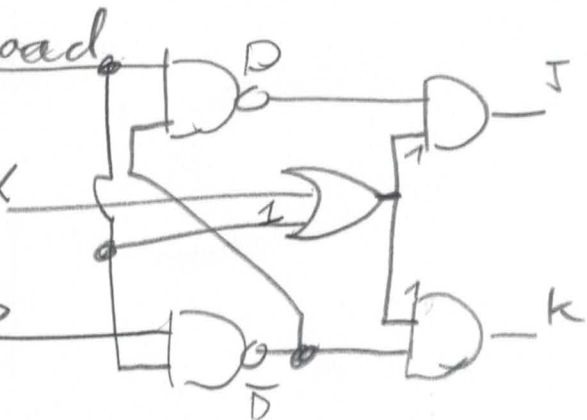
avec les 2 valeurs des charges



OF OE OD OC OB OA 9C

Il faut noter que ces états
retournent bien à un moment ou
à un autre car les états autorisés
 $\in \{0, 9\}$.

Étude de



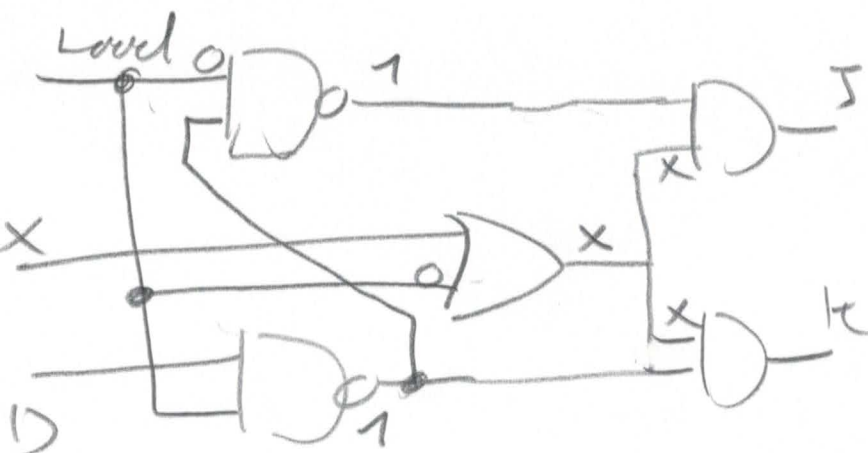
a) si $\overline{Load} = 0 \Rightarrow Load = 1$

$$J = D \quad K = \overline{D} \Rightarrow \overline{Q} = D$$

changement du complément

On charge 1, 13, 9, D si Load =

b) si $\overline{Load} = 1 \Rightarrow Load = 0$



$$J = K = X$$

$$EU = (ENP, ENT) = X$$

to ϕ compte sur $\overline{F}$

si $\overline{Load} = 1$ et $EN = 1$

$$J_0 = K_0 = 1 \quad \text{compte}$$

$$J_1 = K_1 = Q_0 Q_3 \quad (CFI)$$

$$J_2 = K_2 = Q_0 Q_1 \quad (CFI)$$

$$J_3 = K_3 = Q_2 \cdot Q_1 Q_0 + Q_0 Q_3 \quad (CFI)$$

On compte si $EN = 1$ et $\overline{Load} = 1$

Entree clear $\rightarrow$ RAZ du compteur

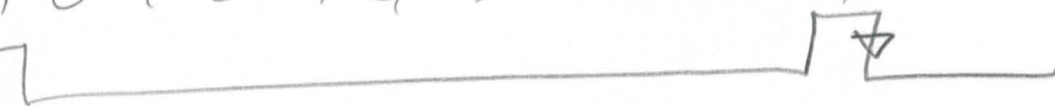
Sortie RCO (Ripple Carry Out)

si $ENT = 1$

$$RCO = Q_0 Q_3 \quad 1001 = 0x09$$

0 1 2 3 4 5 6 7 8 9

(9)



front 7 sur la fin de l'état 9

⇒ permet d'alloquer l'Horloge
de l'éventuel compteur qui suit.