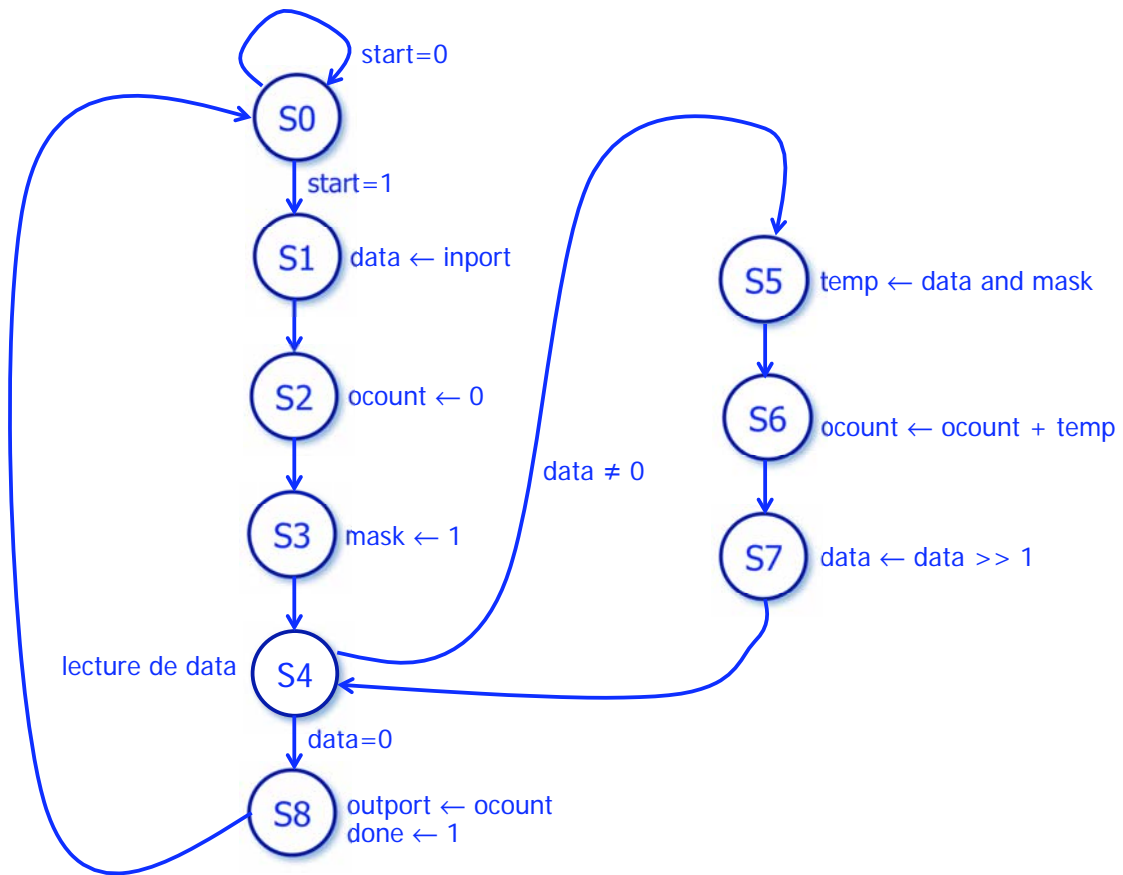


# Structure d'un processeur: Unité de contrôle

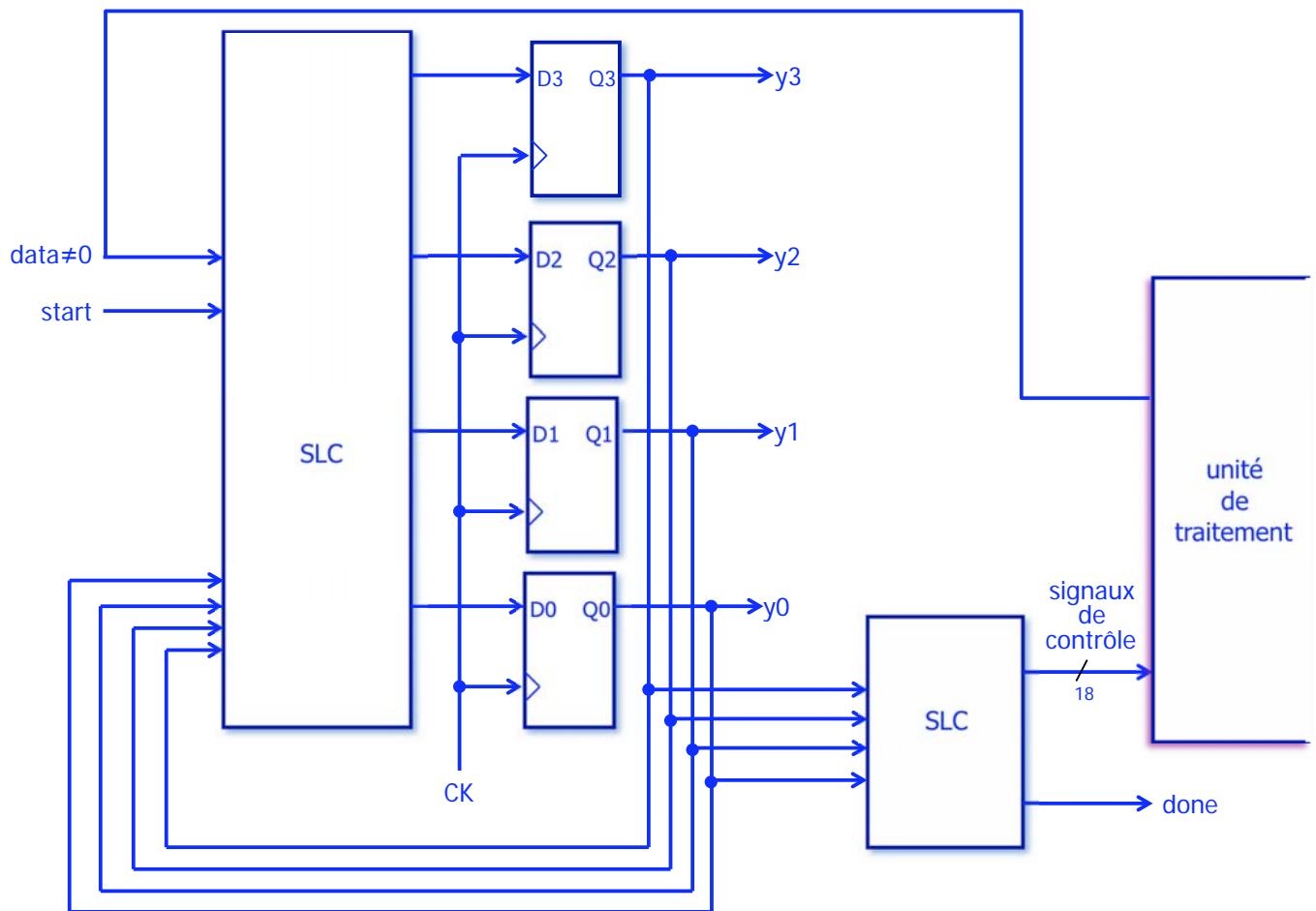
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## Unité de contrôle

- L'unité de contrôle est une machine séquentielle, chargée de séquencer l'algorithme et de générer les signaux de contrôle. Son graphe des états découle directement de l'algorithme:



- Une implémentation, sous forme de machine de Moore, de l'unité de contrôle serait:



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- Une table d'états possible est:

		start, data=0				
		00	01	11	10	
S0	0000	0000	0000	0001	0001	nop
S1	0001	0010	0010	0010	0010	data ← inport
S3	0011	0100	0100	0100	0100	mask ← 1
S2	0010	0011	0011	0011	0011	ocount ← 0
S4	0100	0101	1000	1000	0101	lecture de data
S5	0101	0110	0110	0110	0110	temp ← data and mask
S7	0111	0100	0100	0100	0100	data ← data >> 1
S6	0110	0111	0111	0111	0111	ocount ← ocount + temp
S8	1000	0000	0000	0000	0000	outport ← ocount

$Y_3Y_2Y_1Y_0$

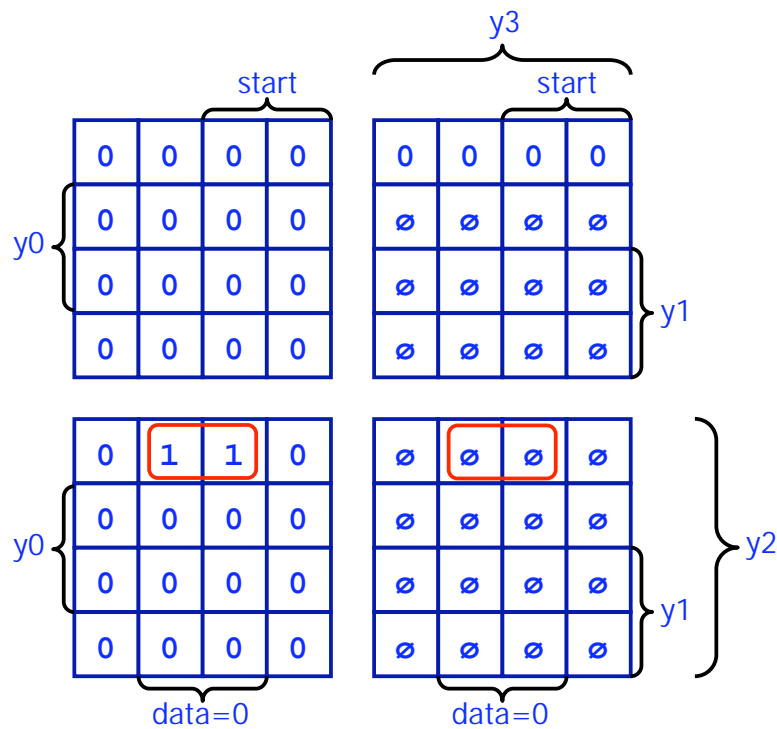
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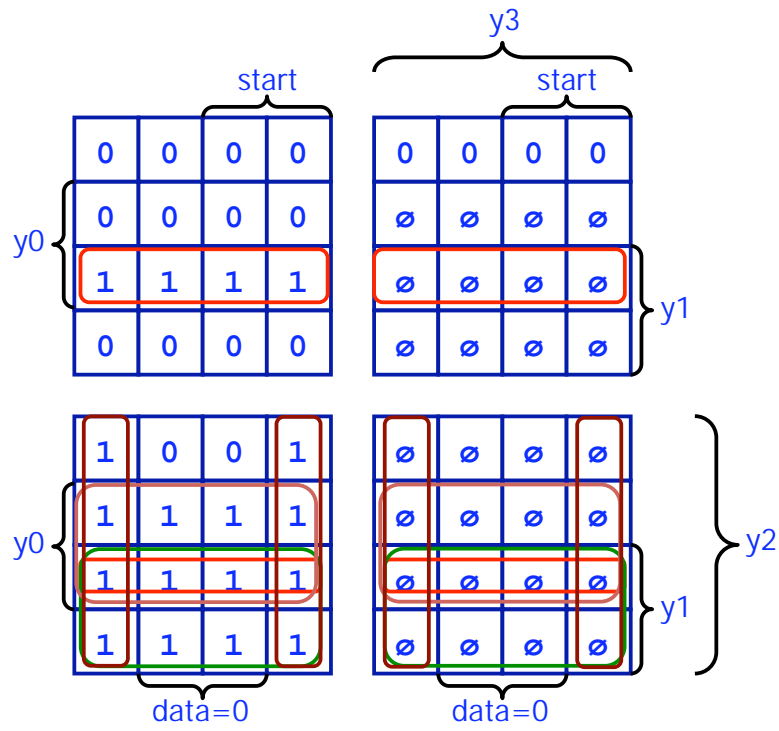
Le détail des signaux de sortie est:

	Y <sub>3</sub>	Y <sub>2</sub>	Y <sub>1</sub>	Y <sub>0</sub>		IE	WA2	WA1	WA0	WEN	RAA2	RAA1	RAA0	RAB2	RAB1	RAB0	M	S1	S0	SH2	SH1	SH0	OE	done	
S0	0000	nop					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S1	0001	data ← inport					1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S3	0011	mask ← 1					0	0	1	0	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1
S2	0010	ocount ← 0					0	0	1	1	1	0	0	0	0	0	0	1	0	1	1	1	1	1	1
S4	0100	lecture de data					0	0	0	0	0	0	1	0	0	0	1	0	1	1	1	1	1	1	1
S5	0101	temp ← data and mask					0	1	0	0	1	0	0	1	0	1	0	0	0	1	1	1	0	0	0
S7	0111	data ← data >> 1					0	0	0	1	1	0	0	1	0	0	0	1	0	1	0	1	0	0	
S6	0110	ocount ← ocount + temp					0	0	1	1	1	0	1	1	1	0	0	1	0	1	1	1	0	0	0
S8	1000	outport ← ocount					0	0	0	0	0	1	1	0	0	0	0	1	0	1	1	0	1	1	

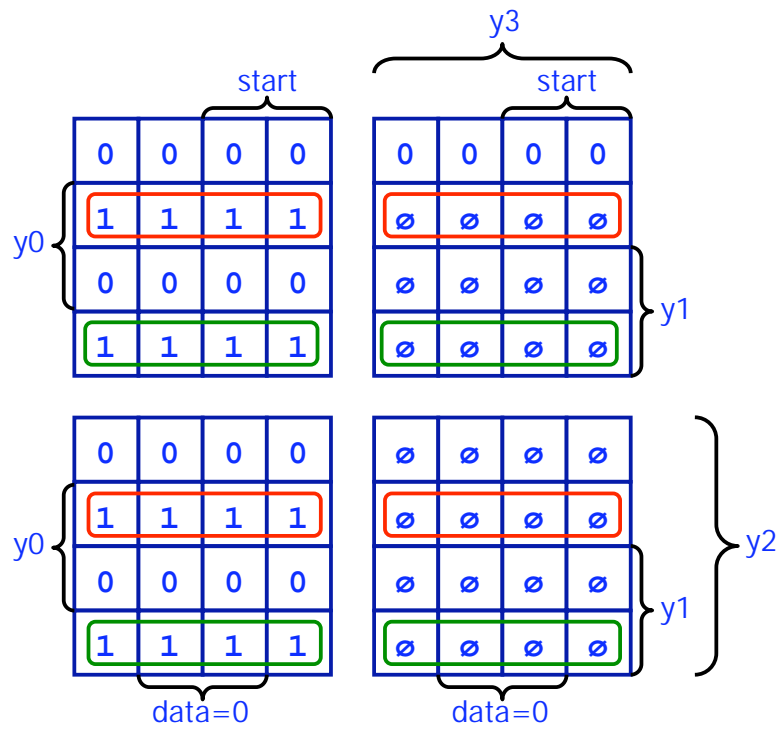
Le calcul des variables d'état est:



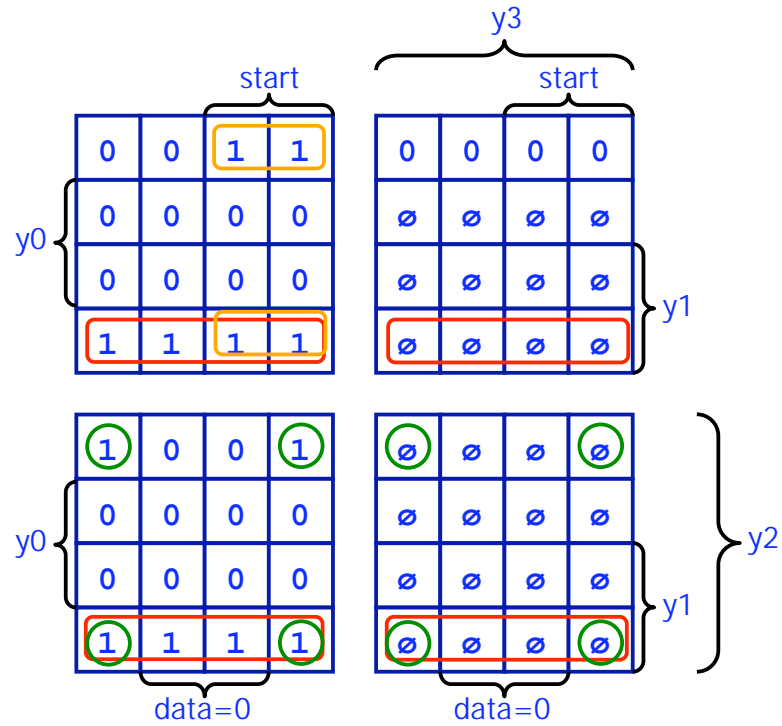
$$y3^+ = (data = 0) \overline{y2} \overline{y1} y0$$



$$y2^+ = y1y0 + y2y0 + y2y1 + \overline{(data = 0)}y2$$

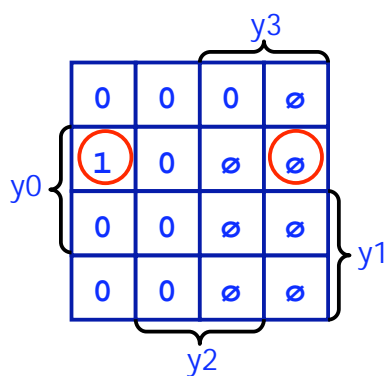


$$y1^+ = \overline{y1}y0 + y1\overline{y0}$$

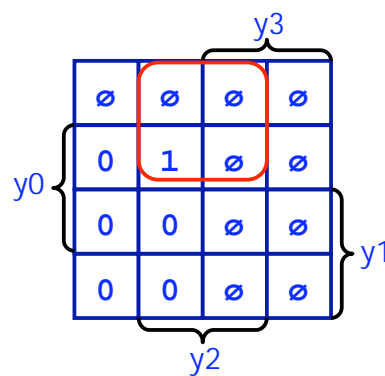


$$y_0^+ = y_1 \overline{y_0} + (\overline{data=0}) y_2 \overline{y_0} + (start) \overline{y_3} \overline{y_2} \overline{y_0}$$

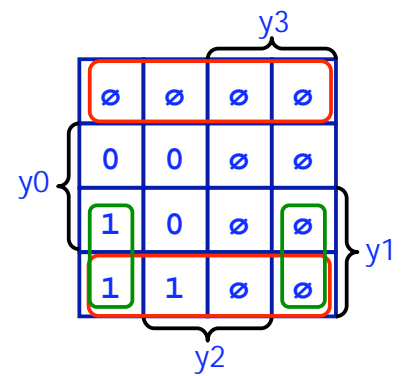
Le calcul des signaux de sortie est:



$$IE = \overline{y_2} \overline{y_1} \overline{y_0}$$



$$WA2 = \overline{y_2} \overline{y_1}$$



$$WA1 = \overline{y_0} + \overline{y_2} \overline{y_1}$$