

Soluciones

Problema 1

Secuencia

MODULE: RTL_EX_FEB2018

INPUTS: Start, Din[7..0]

MEMORY: SEN[7..0], Add_M[7..0]

OUTPUTS: Add[7..0], Rd, Dout[7..0], Send, Lost

0. SEN[7..0] \leftarrow 0
 Add_M[7..0] \leftarrow 0
 \rightarrow (!Start,Start)/(0,1)
1. Rd=1
 Add_M[7..0] \leftarrow !encontre. INC2(Add_M[7..0]) + encontre. INC(Add_M[7..0])
 \rightarrow (!encontre.!fin_mem, !encontre.fin_mem, encontre)/(1,2,3)
2. Send = 1
 Lost = 1
 Dout[7..0] = SEN[7..0]
 SEN[7..0] \leftarrow INC(SEN[7..0])
 Add_M[7..0] \leftarrow 0
 \rightarrow (ultimo,!ultimo)/(0,1)
3. Rd=1
 Send = 1
 Dout[7..0] = Din[7..0]
 SEN[7..0] \leftarrow INC(SEN[7..0])
 Add_M[7..0] \leftarrow 0
 \rightarrow (ultimo,!ultimo)/(0,1)

END SEQUENCE

CONTROL RESET (0)

Add[7..0] = Add_M[7..0]

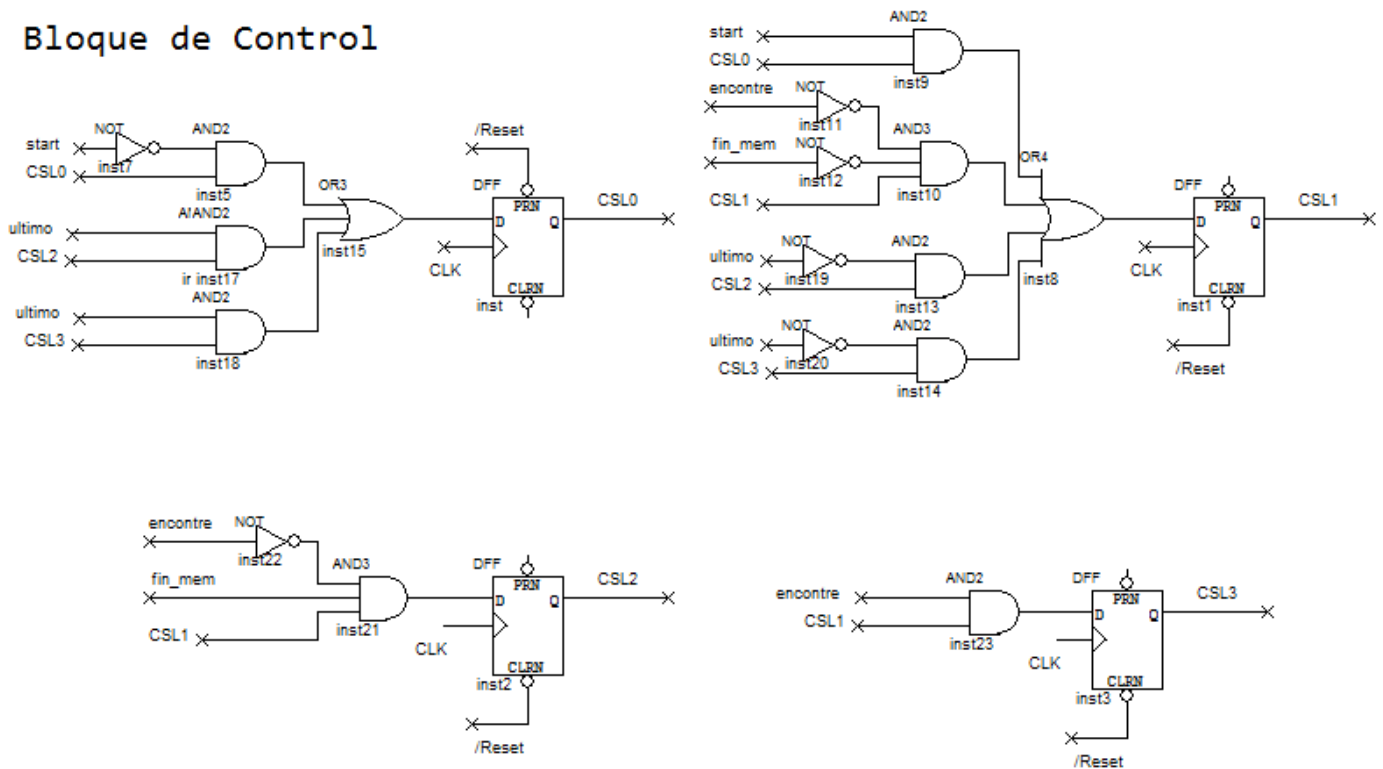
encontre = COMP(Din[7..0], SEN[7..0])

fin_mem = COMP(Add_M[7..0], 0XFE)

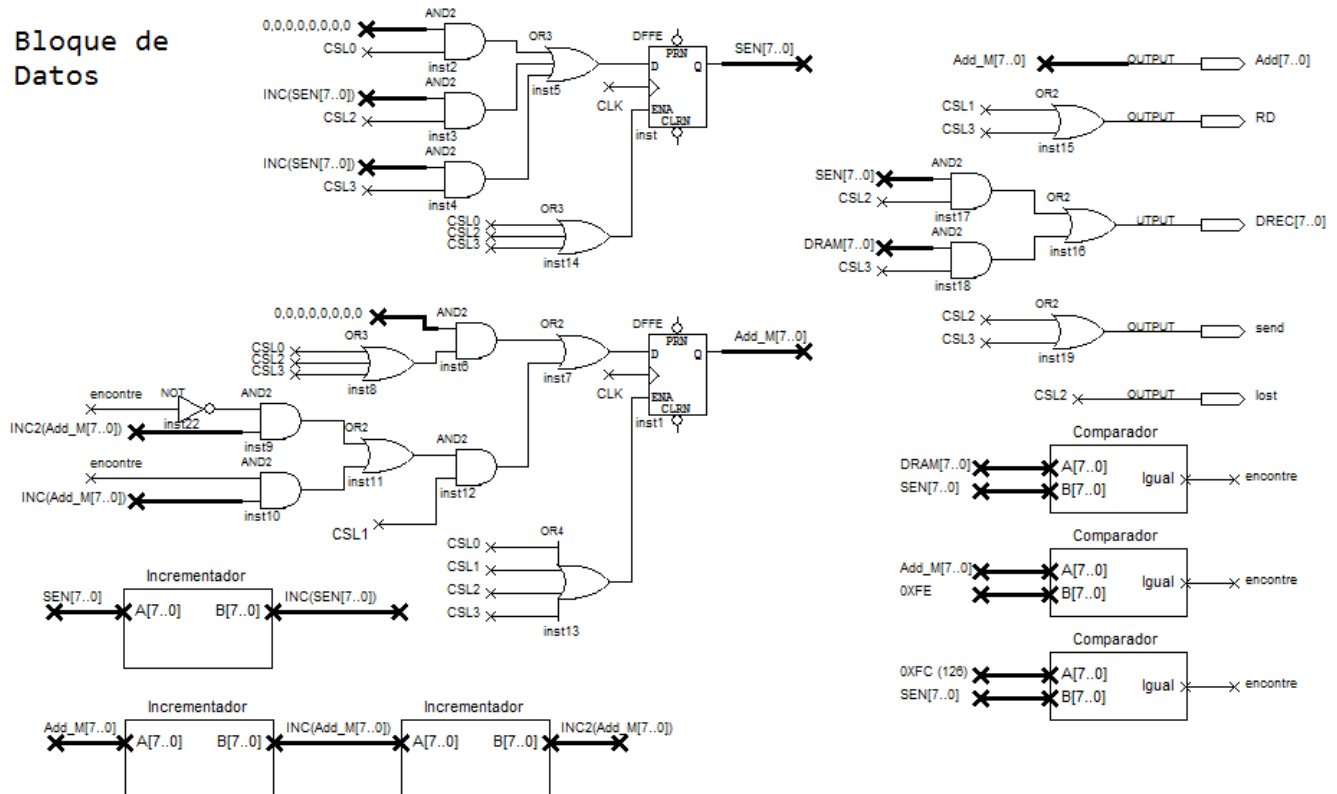
ultimo = COMP(SEN[7..0], 127)

END

Bloque de Control



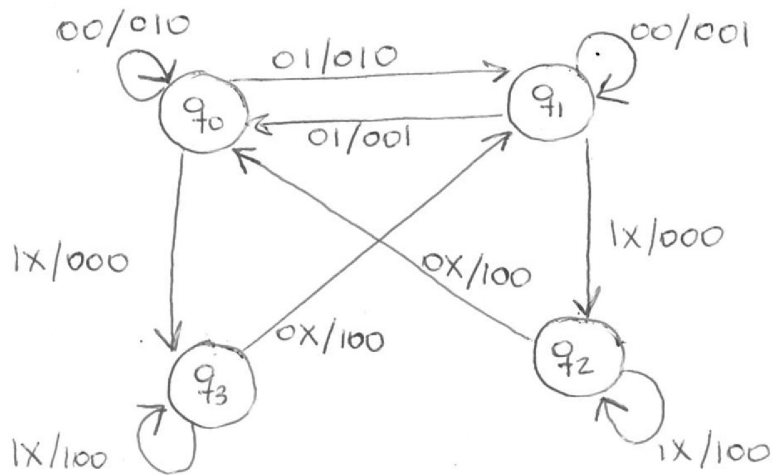
Bloque de Datos



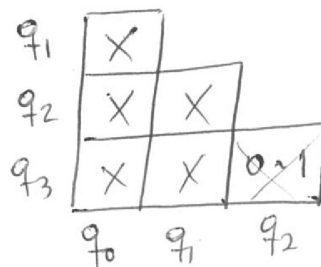
Problema 2

Solución Modo Reloj

TP Tout / R.A.V.Ca



TP Tout / R.A.V.Ca	q _{n+1}				R.A.V.Ca			
	00	01	11	10	00	01	11	10
q ₀	q ₀	q ₁	q ₃	q ₃	010	010	000	000
q ₁	q ₁	q ₀	q ₂	q ₂	001	001	000	000
q ₂	q ₀	q ₀	q ₂	q ₂	100	100	100	100
q ₃	q ₁	q ₁	q ₃	q ₃	100	100	100	100



Es mínimo

Codificación:

- q₀ - 00
- q₁ - 01
- q₂ - 11
- q₃ - 10

		q_{n+1}				R. Av. C_2			
		00 01 11 10				00 01 11 10			
$q_1 q_0$	TP _{Tact}	00	01	11	10	00	01	11	10
00		00	01	10	10	010	010	000	000
01		01	00	11	11	001	001	000	000
11		00	00	11	11	100	100	100	100
10		01	01	10	10	100	100	100	100

$q_1 q_0$	TP _{Tact}	00	01	11	10
00		0	0	1	1
01		0	0	1	1
11		0	0	1	1
10		0	0	1	1

$$D_1 = TP$$

$q_1 q_0$	TP _{Tact}	00	01	11	10
00		0	1	0	0
01		1	0	1	1
11		0	0	1	1
10		1	1	0	0

$$D_0 = q_0 TP + \bar{q}_0 \bar{TP} Tact + \bar{q}_1 q_0 Tact + q_1 \bar{q}_0 \bar{TP}$$

$q_1 q_0$	TP _{Tact}	00	01	11	10
00		0	0	0	0
01		0	0	0	0
11		1	1	1	1
10		1	1	1	1

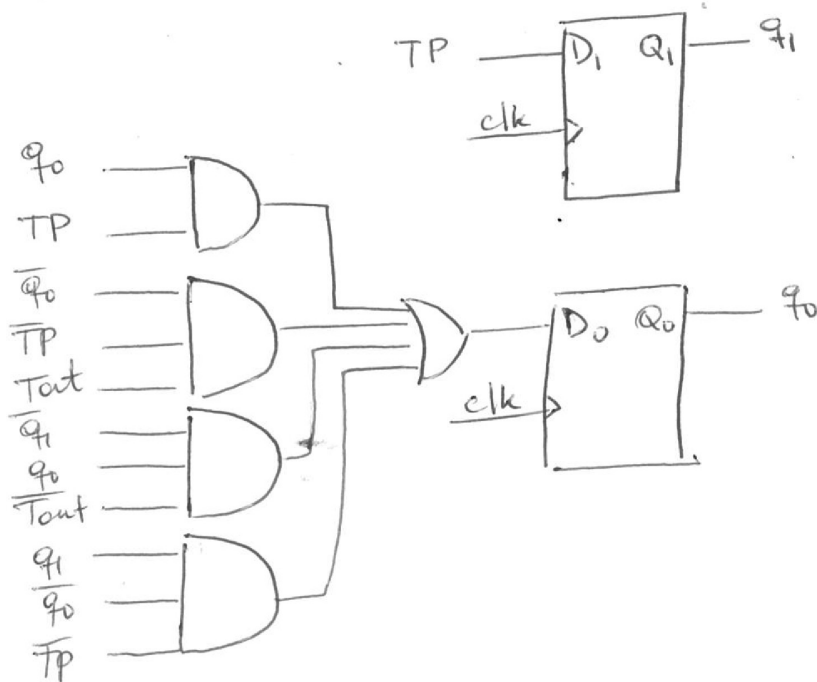
$$R = q_1$$

$q_1 q_0$	TP _{Tact}	00	01	11	10
00		1	1	0	0
01		0	0	0	0
11		0	0	0	0
10		0	0	0	0

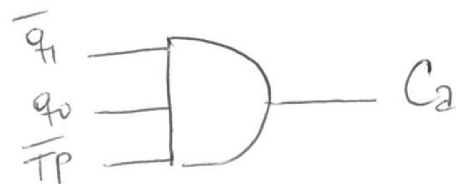
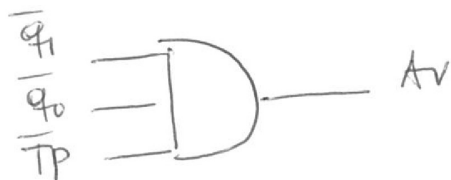
$$Av = \bar{q}_1 \bar{q}_0 \bar{TP}$$

$q_1 q_0$	TP _{Tact}	00	01	11	10
00		0	0	0	0
01		1	1	0	0
11		0	0	0	0
10		0	0	0	0

$$C_2 = \bar{q}_1 q_0 \bar{TP}$$



q_1 _____ R



Ejercicio 1

a) Palabra recibida: 1100100

$$V1 = P1 \oplus m0 \oplus m2 \oplus m3 = 1 \oplus 0 \oplus 1 \oplus 0 = 0$$

$$V2 = P2 \oplus m0 \oplus m1 \oplus m3 = 1 \oplus 0 \oplus 0 \oplus 0 = 1$$

$$V3 = P3 \oplus m0 \oplus m1 \oplus m2 = 0 \oplus 1 \oplus 0 \oplus 0 = 1$$

V3V2V1=110 Error en el bit 6: m1

La palabra codificada sin error es: 1100110 -> m3m2m1m0 = 0110

Palabra recibida: 0111010

$$V1 = P1 \oplus m0 \oplus m2 \oplus m3 = 0 \oplus 1 \oplus 0 \oplus 0 = 1$$

$$V2 = P2 \oplus m0 \oplus m1 \oplus m3 = 1 \oplus 1 \oplus 1 \oplus 0 = 1$$

$$V3 = P3 \oplus m0 \oplus m1 \oplus m2 = 1 \oplus 0 \oplus 1 \oplus 0 = 0$$

V3V2V1=110 Error en el bit 3: m3

La palabra codificada sin error es: 0101010 -> m3m2m1m0 = 0010

b) Palabra a codificar: 1101

$$P1 = m0 \oplus m2 \oplus m3 = 1$$

$$P2 = m0 \oplus m1 \oplus m3 = 0$$

$$P3 = m0 \oplus m1 \oplus m2 = 0$$

$$P1P2m3P3m2m1m0 = 1010101$$

Ejercicio 2

	00	01	11	10	00	01	11	10
a	a	a	b	c	0	1		
b	a	d	b	b			0	1
c	c	a	b	c	1			0
d	a	d	d	b		0	1	

Conjuntos de destino

(a,b,d)	(a,c)	(b,a,c)	(b,d)
(c)	(d,b)	(d)	(c,a)

Adyacentes: a y c, b y d; asigmo:

a = 00

c = 01

d = 10

b = 11

Hay que hacer 2 ciclos:

columna 00 b -> a por d

columna 11 a -> b por c

		00	01	11	10	00	01	11	10
00	a	a	a	b c	c	0	1	X	0
11	b	a d	d	b	b	1	0	0	1
01	c	c	a	b	c	1	1	0	0
10	d	a	d	d	b	1	0	1	1