

lufe 1140

Q.1

$$3_{10} + (-32)_{10} =$$

(two complement)

Tp R

①

$$\begin{array}{r}
 000011 \text{ (3)} \\
 + 100000 \text{ (-32)} \\
 \hline
 100011 \text{ (-29)}
 \end{array}$$

Q.2

$$AB_{16} + 2E_{16} =$$

$$\begin{array}{r}
 10101011 \text{ (AB}_{16}) \\
 + 0011110 \\
 \hline
 11101001 \rightarrow ES_{16}
 \end{array}$$

Q.3

$$-28_{10} - 3_{10} =$$

16+8+4

$$28 = 011100$$

$$-28 = 100011 + 1 = 100100$$

$$3_{10} = 000011$$

$$-3_{10} = 111101$$

$$\begin{array}{r}
 111 \\
 \Rightarrow 100\cancel{1}00 \\
 111101 \\
 \hline
 110001
 \end{array}$$

↓
OVF

Q.4

$$Y = (A+B)(\bar{A}+\bar{B}) = A\bar{A} + A\bar{B} + B\bar{B} + B\bar{A}$$

$$= A\bar{B} + \bar{A}B = A \oplus B \quad (\text{xOR})$$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

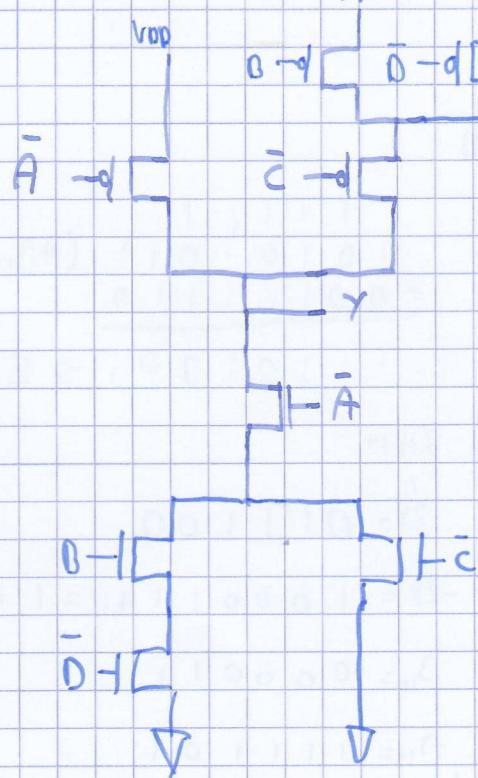
Q.5

$$Y = \bar{C}(\bar{A}+\bar{B}) = Y = \bar{A}\bar{C} + \bar{B}\bar{C}$$

A	B	C	Y
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

7.6

$$Y = A + \bar{B}C + CD = A + C(\bar{B} + D)$$



Linf 01140

TP 8

①

8.1

CD	00	01	11	10
00	0	0	1	1
01	0	0	0	0
11	0	0	0	0
10	1	X	X	1

$$Y = \underline{\bar{B}\bar{D}} + \underline{A\bar{D}}$$

8.2

CD	00	01	11	10
00	1	0	X	1
01	1	0	X	1
11	0	0	0	0
10	0	0	1	1

$$Y = \underline{\bar{B}\bar{C}} + \underline{A\bar{D}}$$

8.3

CD	00	01	11	10
00	X	0	1	1
01	X	X	0	0
11	0	X	0	0
10	X	0	X	X

$$Y = A\bar{D} + A\bar{D} + AC$$

8.4

CD	00	01	11	10
00	0	0	0	0
01	1	X	0	0
11	X	X	1	1
10	X	X	X	0

$$Y = \underline{A\bar{B}\bar{C}\bar{D}} + \underline{\bar{A}D} + \underline{CD} + \underline{BD}$$

8.5

A	0	1
B	0	1
C	0	1
D	0	1
E	0	1

$$X = A + \overline{D}C + \overline{B}\overline{C}$$

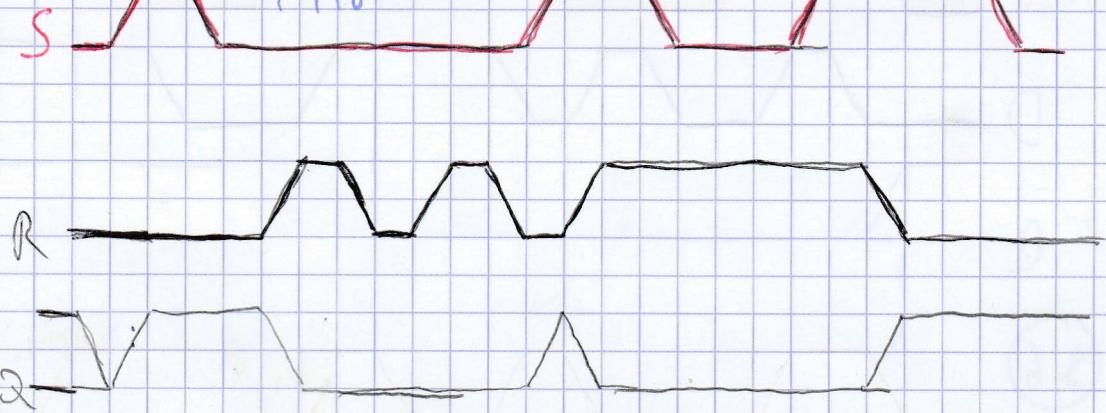
8.6

AD	0	0	0	1	1	1	0
CD	0	0	1	0	0	0	1
00	0	0	1	0	0	0	1
01	0	1	0	0	0	0	0
11	1	0	0	0	0	0	0
10	1	0	0	0	0	0	0

$$X = \underline{\overline{A}\overline{D}} + \underline{\overline{A}\overline{C}\overline{D}} + \underline{\overline{B}\overline{C}\overline{D}}$$

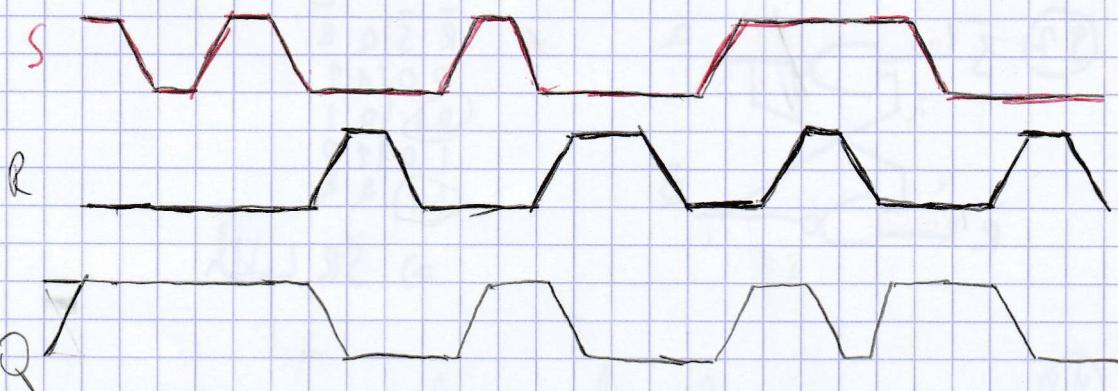
lundi 11/4/05
TP 9

Rappel: SR | Y
0 0 0 0
1 1 1 0



(normalement légèrement décalés sur la droite)

S.2



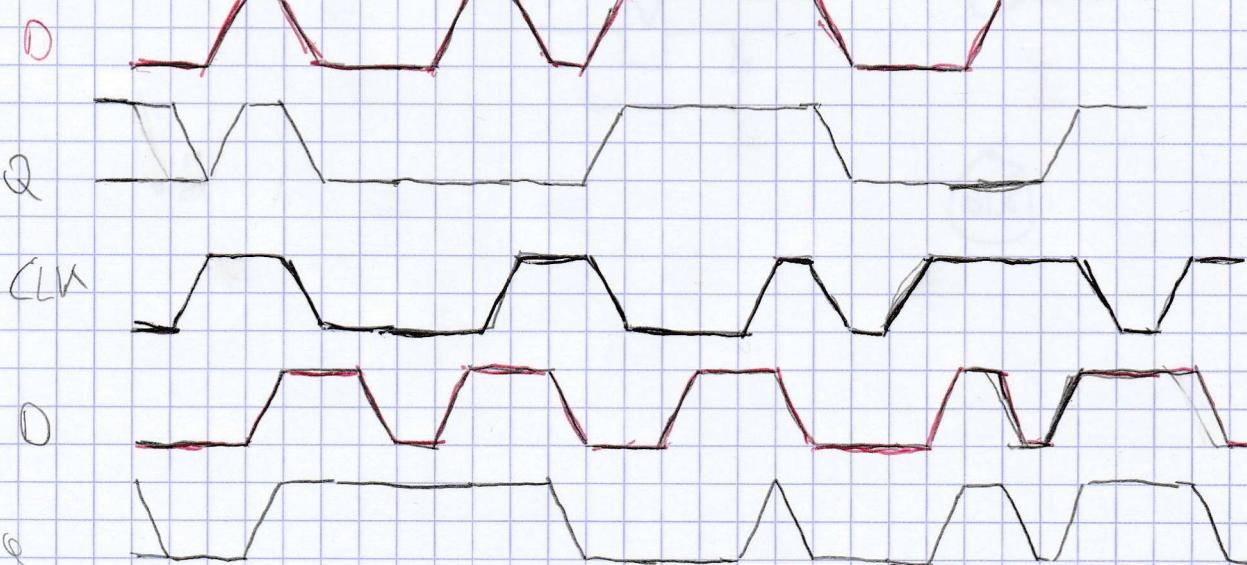
S.3



Rappel:

CLK D |
0 X 0
1 0 0
1 1 1

S.4



D-FF

9.5

CLK

D

Q

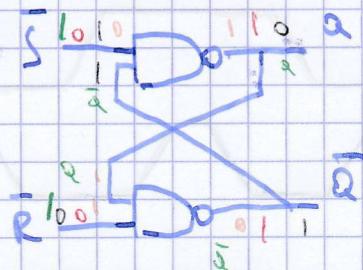
9.6

CLK

D

Q

9.7



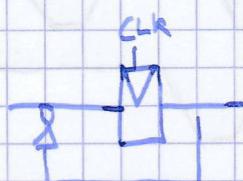
\bar{R}	\bar{S}	Q	\bar{a}
0	0	1	1
0	1	0	1
1	0	1	0
1	1	0	0

\Rightarrow SR Latch

9.8

Séquentiel car il boucle sur lui-même

9.9



9.10

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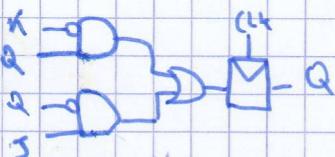
TPG

(?)

8.10

JK		Q	Q'
00	01	11	10
00	00	01	11
10	00	01	10

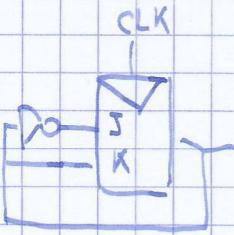
$$\bar{Q} + \bar{J}\bar{Q}$$



① b



②

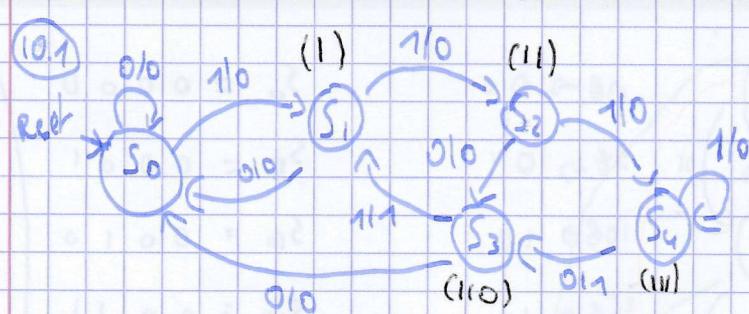


Q	0	1
0	01	01
1	01	01

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FP10

4



$$\begin{matrix} S_0 & = & 0 & 0 & 0 \\ S_{01} & = & 0 & 0 & 1 \\ S_2 & = & 0 & 1 & 0 \\ S_3 & = & 1 & 0 & 0 \\ S_4 & = & 1 & 0 & 1 \end{matrix}$$

S_2	S_1	S_0	Q
0 0 0	0 0 0	0 0 0	0
0 0 0	1	0 0 0	0
0 0 1	0	0 0 0	0
0 0 1	1	0 0 0	0
0 1 0	0	1 0 0	0
0 1 0	1	0 0 0	0
1 0 0	0	0 0 0	0
1 0 0	0	0 0 0	1
1 0 0	0	0 0 0	0
1 0 1	0	1 0 0	1
1 0 1	0	0 0 0	0
1 0 1	0	0 0 0	0

$$S_2 = S_1 + S_2 S_3$$

$$S_1 =$$

$$S_0 = 1$$

Q =

S_2	S_1	S_0	00	01	11	10
1	0	0	0	1	X	0
0	1	0	0	1	X	0
1	1	0	X	X	1	
1	0	0	X	X		1

$$S_2 = S_1 + S_2 S_0$$

S1

$$\frac{dy}{dx} = \Delta$$

S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S_{10}
00	00	00	11	11	11	10			
00	00	00	x	0					
01	00	00	x	0					
11	1*	x	x	0					
10	0	x	x	0					

$$\vec{s}_i = \bar{s}_i s_{0,i}$$

A hand-drawn logic diagram on lined paper. It shows an OR gate symbol with three input lines labeled S_2 , S_0 , and S_1 from left to right, and one output line labeled Q .

S_0	0	0	0	1	1	1	0
S_0	0	0	X	0			
S_1	1	1	X	1			
S_1	0	X	X	1			
S_0	0	X	X	0			

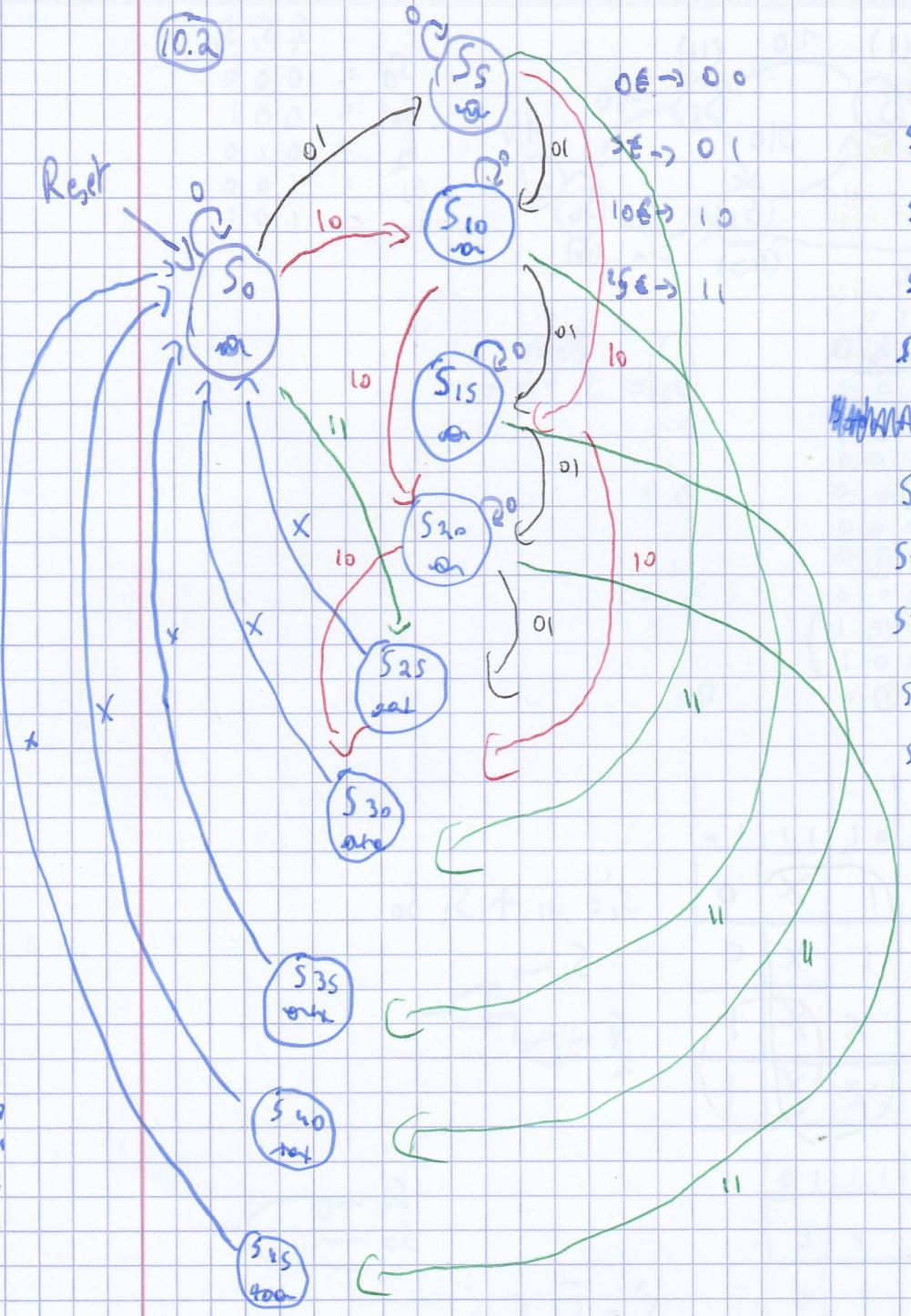
$$S_0 = \bar{S}_0 a + S_1 a$$

Δ	1	0	0	0	1	1	1	0
0	0	0	0	X	0			
0	1	0	0		X	0		
1	1	0	X			1	1	
1	0	X		X			1	

$$Q = S_2 S_0$$

$$S_2 = \overline{S_0}$$

10.2



$$S_0 = 00000$$

$$S_5 = 00001$$

$$S_{10} = 00100$$

Rückw.

$$S_{15} = 00111$$

$$S_{20} = 01000$$

Rückwärts

$$S_{25} = 10000 \text{ (Satz)}$$

$$S_{30} = 10001 \text{ (Satz + rechts)}$$

$$S_{35} = 10100 \text{ (Satz + rechts 10)}$$

$$S_{40} = 10111 \text{ (Satz + rechts 15)}$$

$$S_{45} = 11000 \text{ (Satz + rechts 20)}$$

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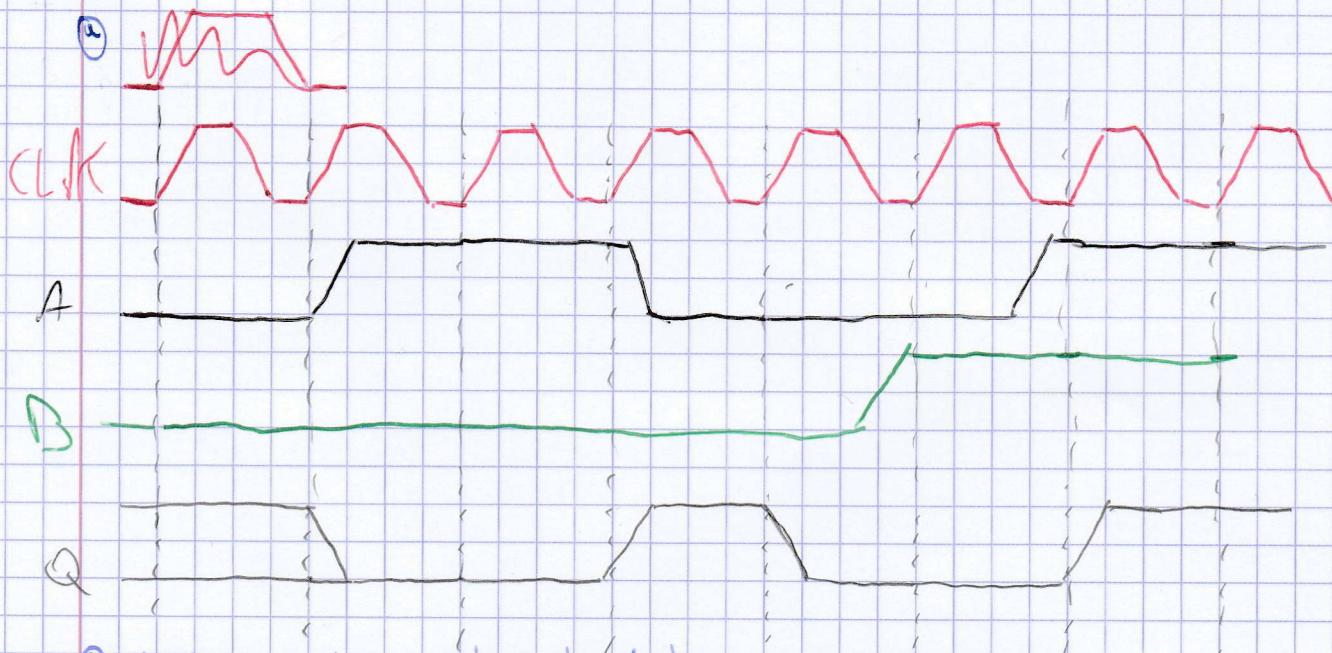
TP10	(0)	$S_3\ S_2\ S_1\ S_0\ a_1\ a_0$	$S_3\ S_2\ S_1\ S_0$	(0)
		0 0 0 0 0 0	0 0 0 0 0 0	(0)
		0 0 0 0 0 1	0 0 0 0 1 0	(0)
		0 0 0 0 1 0	0 0 0 1 0 0	(0)
		0 0 0 0 1 1	0 0 0 0 0 0	(0)
		0 0 0 1 0 0	0 0 0 0 1 0	(0)
		0 0 0 1 0 1	0 0 0 1 0 0	(0)
		0 0 0 1 1 0	0 0 0 0 1 1	(0)
		0 0 0 1 1 1	0 0 0 0 0 0	(0)
		0 0 0 1 1 0	0 0 0 0 1 0	(0)
		0 0 1 0 0 0	0 0 0 1 1 0	(0)
		0 0 1 0 0 1	0 0 0 1 0 0	(0)
		0 0 1 0 1 0	0 0 0 0 1 0	(0)
		0 0 1 0 1 1	0 0 0 0 0 0	(0)
		0 0 1 1 0 0	0 0 0 0 1 0	(0)
		0 0 1 1 0 1	0 0 0 1 0 0	(0)
		0 0 1 1 1 0	0 0 0 0 0 0	(0)
		0 0 1 1 1 1	0 0 0 0 1 0	(0)
		0 0 1 1 1 0	0 0 0 0 0 0	(0)
		0 1 0 0 0 0	0 1 0 0 0 0	(0)
		0 1 0 0 0 1	1 0 0 0 0 0	(0)
		0 1 0 0 1 0	0 0 0 1 0 0	(0)
		0 1 0 0 1 1	0 0 0 0 1 0	(0)
		0 1 0 0 1 0	0 0 0 0 0 0	(0)
		1 0 0 0 X X 0 0 0 0		
	(25)	1 0 0 1 X X 0 0 0 0		
	(33)	1 0 1 0 X X 0 0 0 0		
	(40)	1 0 1 1 X X 0 0 0 0		
	(45)	1 1 0 0 X X 0 0 0 0		

(Là faut faire des Karnaugh en 3D)

Je me suis pas rendu ici pour tout ça ! EY ?!

10.3 $Z_m = A_m A_{m-1}$ (if $B_m=0$)

$Z_m = A_m + A_{m+1}$ (if $B_m=1$)



③ Mealy \Rightarrow prend en compte les transitions

AB

C S₀

S₁

S ₀		A B	Q	S ₁
0	0	0 0	0 0	
0	0	0 1	0 0	
0	1	0 0	0 1	
0	1	1 1	1 1	
1	0	0 0	0 0	
1	0	0 1	1 0	
1	1	0 0	1 1	
1	1	1 1	1 1	

$$S = A$$

$$Q = A \bar{S}_0 + B S_0$$

S ₀	AB	0 0	0 1	1 1	1 0
0	0 0	0 0	0 0	1 1	1 0
1	1 0	1 1	1 1	1 0	0 0

