

Solution de la Série TD N° 4

Exo 1

4 Variables d'entrée $\Rightarrow 2^4$ combinaisons.

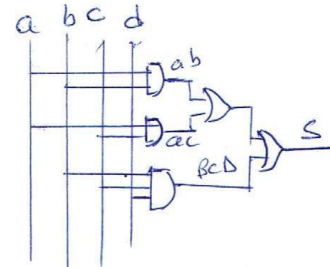
TV

a	b	c	d	S
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

TK

ab	00	01	11	10
00	0	0	1	0
01	0	0	1	0
11	0	1	1	1
10	0	0	1	1

$$S = ab + ac + BcD$$



Exo 2

3 Variables d'entrée $\Rightarrow 2^3$ combinaisons

a	b	c	S ₄	S ₈
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	0	0

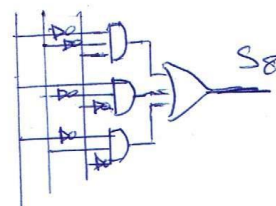
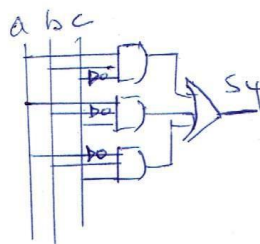
S₄

ab	00	01	11	10
00	0	0	1	0
01	1	0	1	0
11	1	0	1	1

S₈

ab	00	01	11	10
00	0	0	1	0
01	1	1	0	0
11	1	0	0	0

$$S_4 = ab\bar{c} + a\bar{b}c + \bar{a}bc \quad / \quad S_8 = \bar{a}\bar{b}c + a\bar{b}\bar{c} + \bar{a}b\bar{c}$$



Suite de la STN° 4

Exo 3

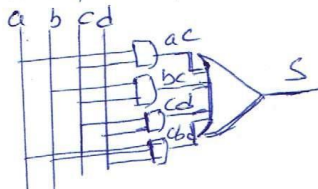
$a = 100 \text{ voix}$, $b = 150 \text{ voix}$, $c = 250 \text{ voix}$, $d = 175 \text{ voix}$
 $(a+b+c+d)/2 = (100+150+250+175)/2 = 337,5 \quad (50\%)$

a	b	c	d	Somme de voix	S
0	0	0	0	0	0
0	0	0	1	175	0
0	0	1	0	250	0
0	0	1	1	425	1
0	1	0	0	150	0
0	1	0	1	325	0
0	1	1	0	400	1
0	1	1	1	575	1
1	0	0	0	100	0
1	0	0	1	275	0
1	0	1	0	350	1
1	0	1	1	525	1
1	1	0	0	175	0
1	1	0	1	350	1
1	1	1	0	425	1
1	1	1	1	600	1

4/

ab	00	01	11	10
00	0	0	0	0
01	0	0	1	0
11	1	1	1	1
10	0	1	1	1

$$S = ac + bc + cd + abd$$



Exo 4

a ₁	a ₂	a ₃	L
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

4/

a ₁ a ₂ a ₃	000	001	011	100
000	0	0	1	0
001	0	0	1	0
011	1	1	0	1

$$\begin{aligned} L &= a_1 \bar{a}_2 \bar{a}_3 + \bar{a}_1 a_2 \bar{a}_3 + \bar{a}_1 \bar{a}_2 a_3 + a_1 a_2 a_3 \\ &= \bar{a}_1 (a_2 \bar{a}_3 + \bar{a}_2 a_3) + a_1 (\bar{a}_2 \bar{a}_3 + a_2 a_3) \\ &= \bar{a}_1 (\underbrace{a_2 \oplus a_3}_{\bar{g}}) + a_1 (\underbrace{\bar{a}_2 \bar{a}_3 + a_2 a_3}_{\bar{g}}) \end{aligned}$$

$$= \bar{a}_1 \bar{g} + a_1 \bar{g} = a_1 \oplus \bar{g} = a_1 \oplus a_2 \oplus a_3$$

$$L = a_1 \oplus a_2 \oplus a_3$$

