

Exercices sur les tableaux de KARNAUGH

I. Exercice 1 :

Simplifiez les fonctions suivantes en utilisant les tableaux de karnaugh :

$$F1 = a.b.\bar{c} + \bar{a}.\bar{b}.c + a.\bar{b}.\bar{c} + a.\bar{b}.c$$

$\begin{smallmatrix} \backslash b.c \\ a \end{smallmatrix}$	00	01	11	10
0	0	1	0	0
1	1	1	0	1

$$F1 = \bar{b}.c + a.\bar{c}$$

F1

$$F2 = a.b.c + \bar{a}.b.c + \bar{a}.\bar{b}.c + a.b.\bar{c}$$

$\begin{smallmatrix} \backslash c \\ a.b \end{smallmatrix}$	0	1
00	0	1
01	0	1
11	1	1
10	0	0

$$F2 = a.b + \bar{a}.c$$

F2

$$F3 = \bar{a}.\bar{b}.c.\bar{d} + \bar{a}.b.\bar{c}.\bar{d} + a.\bar{b}.c.\bar{d} + \bar{a}.\bar{b}.\bar{c}.\bar{d} + a.b.\bar{c}.d + \bar{a}.b.c.d + a.\bar{b}.\bar{c}.d$$

$\begin{smallmatrix} \backslash c.d \\ a.b \end{smallmatrix}$	00	01	11	10
00	1	0	0	1
01	0	1	1	
11	0	1	0	0
10	1	0	0	1

$$F3 = \bar{b}.\bar{d} + b.\bar{c}.d + \bar{a}.b.d$$

F3

$$F7 = \bar{a}.b.\bar{c}.\bar{d} + a.b.\bar{c}.\bar{d} + \bar{a}.\bar{b}.c.\bar{d} + a.\bar{b}.c.\bar{d} + \bar{a}.b.c.\bar{d} + \bar{a}.\bar{b}.\bar{c}.d + a.\bar{b}.\bar{c}.d$$

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

$$F7 = \bar{a}.\bar{b}.\bar{c}.d + b.\bar{c}.\bar{d} + \bar{a}.c.\bar{d} + \bar{b}.c.\bar{d}$$

F7

$$F8 = \bar{a}.\bar{b}.\bar{c}.\bar{d} + \bar{a}.\bar{b}.c.\bar{d} + a.\bar{b}.c.\bar{d} + \bar{a}.b.c.\bar{d} + \bar{a}.\bar{b}.\bar{c}.d + \bar{a}.\bar{b}.\bar{c}.d$$

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

$$F8 = \bar{a}.c.\bar{d} + \bar{b}.c.\bar{d} + \bar{a}.\bar{b}.\bar{c}$$

F8

$$F9 = \bar{a}.\bar{b}.\bar{c}.\bar{d} + \bar{a}.\bar{b}.\bar{c}.d + a.\bar{b}.\bar{c}.\bar{d} + a.\bar{b}.c.\bar{d} + \bar{a}.b.c.d + \bar{a}.\bar{b}.\bar{c}.d$$

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

$$F9 = b.\bar{c}.\bar{d} + \bar{a}.\bar{b}.\bar{c} + \bar{a}.b.c.d + a.\bar{b}.c.\bar{d}$$

F9