Auto1 - Logique et numération

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Exercices supplémentaires

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Tables de vérité et équations non simplifiées

Donner l'équation non simplifiée de la sortie s

a	b	c	s
0	0	0	0
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

$s =$

a	b	c	s
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

$s =$

a	b	c	s
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

$s =$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	1
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	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

$s =$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

$s =$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	0
0	0	1	0	1
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	1
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	0
1	1	1	1	0

$s =$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

$s =$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

$s =$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	1
1	1	1	1	0

$s =$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	1	1	0

$s =$

Tables de vérité et équations non simplifiées (correction)

Donner l'équation non simplifiée de la sortie s

a	b	c	s
0	0	0	0
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

$s = a \cdot \overline{b} \cdot \overline{c} \vee b \cdot \overline{a} \cdot \overline{c}$

a	b	c	s
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

$s = a \cdot b \cdot c \vee a \cdot \overline{b} \cdot \overline{c}$

a	b	c	s
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

$s = a \cdot b \cdot \overline{c} \vee a \cdot c \cdot \overline{b} \vee \overline{a} \cdot \overline{b} \cdot \overline{c}$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	1
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	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

$s = a \cdot b \cdot \overline{c} \cdot \overline{d} \vee a \cdot c \cdot \overline{b} \cdot \overline{d} \vee b \cdot c \cdot d \cdot \overline{a} \vee d \cdot \overline{a} \cdot \overline{b} \cdot \overline{c} \vee \overline{a} \cdot \overline{b} \cdot \overline{c} \cdot \overline{d}$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

$$s = a \cdot b \cdot c \cdot \overline{d} \vee a \cdot b \cdot d \cdot \overline{c} \vee a \cdot c \cdot d \cdot \overline{b} \vee b \cdot d \cdot \overline{a} \cdot \overline{c} \vee c \cdot d \cdot \overline{a} \cdot \overline{b} \vee \overline{a} \cdot \overline{b} \cdot \overline{c} \cdot \overline{d}$$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	0
0	0	1	0	1
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	1
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	0
1	1	1	1	0

$$s = a \cdot b \cdot d \cdot \overline{c} \vee a \cdot b \cdot \overline{c} \cdot \overline{d} \vee a \cdot d \cdot \overline{b} \cdot \overline{c} \vee a \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} \vee b \cdot c \cdot d \cdot \overline{a} \vee c \cdot \overline{a} \cdot \overline{b} \cdot \overline{d} \vee \overline{a} \cdot \overline{b} \cdot \overline{c} \cdot \overline{d}$$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

$$s = a \cdot c \cdot d \cdot \overline{b} \vee a \cdot c \cdot \overline{b} \cdot \overline{d} \vee a \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} \vee b \cdot c \cdot \overline{a} \cdot \overline{d} \vee c \cdot \overline{a} \cdot \overline{b} \cdot \overline{d}$$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

$$s = a \cdot b \cdot \overline{c} \cdot \overline{d} \vee a \cdot c \cdot d \cdot \overline{b} \vee a \cdot c \cdot \overline{b} \cdot \overline{d} \vee a \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} \vee b \cdot c \cdot d \cdot \overline{a} \vee b \cdot d \cdot \overline{a} \cdot \overline{c} \vee b \cdot \overline{a} \cdot \overline{c} \cdot \overline{d} \vee c \cdot d \cdot \overline{a} \cdot \overline{b}$$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	1
1	1	1	1	0

$$s = a \cdot b \cdot c \cdot \overline{d} \vee a \cdot b \cdot \overline{c} \cdot \overline{d} \vee a \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} \vee b \cdot c \cdot d \cdot \overline{a} \vee b \cdot \overline{a} \cdot \overline{c} \cdot \overline{d} \vee d \cdot \overline{a} \cdot \overline{b} \cdot \overline{c} \vee \overline{a} \cdot \overline{b} \cdot \overline{c} \cdot \overline{d}$$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	1	1	0

$$s = a \cdot b \cdot d \cdot \overline{c} \vee a \cdot c \cdot \overline{b} \cdot \overline{d} \vee a \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} \vee b \cdot d \cdot \overline{a} \cdot \overline{c} \vee b \cdot \overline{a} \cdot \overline{c} \cdot \overline{d} \vee d \cdot \overline{a} \cdot \overline{b} \cdot \overline{c}$$

Simplification d'équations

Simplifier ces équations avec les règles de l'algèbre de Boole.

$a \cdot b + b \cdot \overline{a} =$

$a \cdot b + a \cdot \overline{b} + \overline{a} \cdot \overline{b} =$

$a \cdot b + a \cdot \overline{b} =$

$a \cdot \overline{b} + b \cdot \overline{a} + \overline{a} \cdot \overline{b} =$

$a \cdot b \cdot \overline{c} + a \cdot \overline{b} \cdot \overline{c} =$

$a \cdot b \cdot c + a \cdot c \cdot \overline{b} + a \cdot \overline{b} \cdot \overline{c} + b \cdot c \cdot \overline{a} =$

$b \cdot \overline{a} + b \cdot \overline{c} + a \cdot b \cdot c =$

$\overline{a} \cdot \overline{c} + \overline{b} \cdot \overline{c} + a \cdot b \cdot \overline{c} =$

$a \cdot b + a \cdot b \cdot c + a \cdot c \cdot \overline{b} + a \cdot \overline{b} \cdot \overline{c} + c \cdot \overline{a} \cdot \overline{b} =$

$b \cdot c + c \cdot \overline{b} + \overline{a} \cdot \overline{b} \cdot \overline{c} =$

$b \cdot \overline{c} + a \cdot b \cdot c + a \cdot b \cdot \overline{c} + a \cdot c \cdot \overline{b} + b \cdot \overline{a} \cdot \overline{c} =$

$a \cdot b \cdot c + a \cdot c \cdot \overline{b} + a \cdot \overline{b} \cdot \overline{c} =$

$c \cdot \overline{a} + a \cdot b \cdot c + a \cdot c \cdot \overline{b} + b \cdot c \cdot \overline{a} + c \cdot \overline{a} \cdot \overline{b} =$

$a \cdot b \cdot c + b \cdot c \cdot \overline{a} + b \cdot \overline{a} \cdot \overline{c} =$

$\overline{b} \cdot \overline{c} + a \cdot b \cdot \overline{c} + a \cdot c \cdot \overline{b} + c \cdot \overline{a} \cdot \overline{b} =$

$a \cdot b \cdot c + a \cdot c \cdot \overline{b} + b \cdot c \cdot \overline{a} + b \cdot \overline{a} \cdot \overline{c} + c \cdot \overline{a} \cdot \overline{b} =$

$b \cdot d \cdot \overline{c} + a \cdot c \cdot d \cdot \overline{b} + a \cdot c \cdot \overline{b} \cdot \overline{d} + a \cdot d \cdot \overline{b} \cdot \overline{c} + a \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} + d \cdot \overline{a} \cdot \overline{b} \cdot \overline{c} =$

$a \cdot b \cdot d + b \cdot c \cdot d + c \cdot d \cdot \overline{b} + a \cdot b \cdot \overline{c} \cdot \overline{d} =$

$c \cdot \overline{b} \cdot \overline{d} + a \cdot c \cdot d \cdot \overline{b} + a \cdot c \cdot \overline{b} \cdot \overline{d} + b \cdot d \cdot \overline{a} \cdot \overline{c} + b \cdot \overline{a} \cdot \overline{c} \cdot \overline{d} + c \cdot d \cdot \overline{a} \cdot \overline{b} + c \cdot \overline{a} \cdot \overline{b} \cdot \overline{d} =$

$a \cdot b \cdot d + a \cdot d \cdot \overline{c} + a \cdot c \cdot d \cdot \overline{b} + b \cdot c \cdot d \cdot \overline{a} + b \cdot d \cdot \overline{a} \cdot \overline{c} =$

$a \cdot b \cdot d + a \cdot b \cdot \overline{c} + b \cdot c \cdot d + a \cdot b \cdot c \cdot \overline{d} + a \cdot b \cdot \overline{c} \cdot \overline{d} + b \cdot c \cdot d \cdot \overline{a} =$

$a \cdot b \cdot d + a \cdot c \cdot \overline{d} + a \cdot \overline{b} \cdot \overline{d} + a \cdot b \cdot c \cdot d + a \cdot b \cdot \overline{c} \cdot \overline{d} =$

$a \cdot c \cdot d + b \cdot d \cdot \overline{a} + b \cdot d \cdot \overline{c} + c \cdot d \cdot \overline{b} + d \cdot \overline{a} \cdot \overline{b} + a \cdot b \cdot c \cdot d + a \cdot d \cdot \overline{b} \cdot \overline{c} + b \cdot c \cdot d \cdot \overline{a} + c \cdot \overline{a} \cdot \overline{b} \cdot \overline{d} =$

$a \cdot b \cdot d + a \cdot \overline{b} \cdot \overline{d} + a \cdot b \cdot c \cdot \overline{d} + a \cdot b \cdot \overline{c} \cdot \overline{d} + a \cdot c \cdot d \cdot \overline{b} + a \cdot d \cdot \overline{b} \cdot \overline{c} + a \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} + b \cdot c \cdot d \cdot \overline{a} + b \cdot c \cdot \overline{a} \cdot \overline{d} + b \cdot \overline{a} \cdot \overline{c} \cdot \overline{d} + c \cdot d \cdot \overline{a} \cdot \overline{b} =$

$b \cdot \overline{a} \cdot \overline{d} + c \cdot d \cdot \overline{a} + c \cdot \overline{a} \cdot \overline{b} \cdot \overline{d} + \overline{a} \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} =$

$a \cdot b \cdot d + a \cdot b \cdot \overline{c} + b \cdot d \cdot \overline{a} \cdot \overline{c} + b \cdot \overline{a} \cdot \overline{c} \cdot \overline{d} =$

$a \cdot \overline{b} \cdot \overline{c} + b \cdot c \cdot \overline{a} + b \cdot c \cdot \overline{d} + d \cdot \overline{b} \cdot \overline{c} + \overline{b} \cdot \overline{c} \cdot \overline{d} + a \cdot b \cdot c \cdot d + a \cdot d \cdot \overline{b} \cdot \overline{c} =$

$a \cdot d \cdot \overline{c} + a \cdot \overline{b} \cdot \overline{c} + a \cdot b \cdot d \cdot \overline{c} + a \cdot b \cdot \overline{c} \cdot \overline{d} + b \cdot \overline{a} \cdot \overline{c} \cdot \overline{d} + \overline{a} \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} =$

Simplification d'équations (correction)

Simplifier ces équations avec les règles de l'algèbre de Boole.

$a \cdot b + b \cdot \overline{a} = b$

$a \cdot b + a \cdot \overline{b} + \overline{a} \cdot \overline{b} = a + \overline{b}$

$a \cdot b + a \cdot \overline{b} = a$

$a \cdot \overline{b} + b \cdot \overline{a} + \overline{a} \cdot \overline{b} = \overline{a} + \overline{b}$

$a \cdot b \cdot \overline{c} + a \cdot \overline{b} \cdot \overline{c} = a \cdot \overline{c}$

$a \cdot b \cdot c + a \cdot c \cdot \overline{b} + a \cdot \overline{b} \cdot \overline{c} + b \cdot c \cdot \overline{a} = a \cdot \overline{b} + b \cdot c$

$b \cdot \overline{a} + b \cdot \overline{c} + a \cdot b \cdot c = b$

$\overline{a} \cdot \overline{c} + \overline{b} \cdot \overline{c} + a \cdot b \cdot \overline{c} = \overline{c}$

$a \cdot b + a \cdot b \cdot c + a \cdot c \cdot \overline{b} + a \cdot \overline{b} \cdot \overline{c} + c \cdot \overline{a} \cdot \overline{b} = a + c \cdot \overline{b}$

$b \cdot c + c \cdot \overline{b} + \overline{a} \cdot \overline{b} \cdot \overline{c} = c + \overline{a} \cdot \overline{b}$

$b \cdot \overline{c} + a \cdot b \cdot c + a \cdot b \cdot \overline{c} + a \cdot c \cdot \overline{b} + b \cdot \overline{a} \cdot \overline{c} = a \cdot c + b \cdot \overline{c}$

$a \cdot b \cdot c + a \cdot c \cdot \overline{b} + a \cdot \overline{b} \cdot \overline{c} = a \cdot c + a \cdot \overline{b}$

$c \cdot \overline{a} + a \cdot b \cdot c + a \cdot c \cdot \overline{b} + b \cdot c \cdot \overline{a} + c \cdot \overline{a} \cdot \overline{b} = c$

$a \cdot b \cdot c + b \cdot c \cdot \overline{a} + b \cdot \overline{a} \cdot \overline{c} = b \cdot c + b \cdot \overline{a}$

$\overline{b} \cdot \overline{c} + a \cdot b \cdot \overline{c} + a \cdot c \cdot \overline{b} + c \cdot \overline{a} \cdot \overline{b} = a \cdot \overline{c} + \overline{b}$

$a \cdot b \cdot c + a \cdot c \cdot \overline{b} + b \cdot c \cdot \overline{a} + b \cdot \overline{a} \cdot \overline{c} + c \cdot \overline{a} \cdot \overline{b} = c + b \cdot \overline{a}$

$b \cdot d \cdot \overline{c} + a \cdot c \cdot d \cdot \overline{b} + a \cdot c \cdot \overline{b} \cdot \overline{d} + a \cdot d \cdot \overline{b} \cdot \overline{c} + a \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} + d \cdot \overline{a} \cdot \overline{b} \cdot \overline{c} = a \cdot \overline{b} + d \cdot \overline{c}$

$a \cdot b \cdot d + b \cdot c \cdot d + c \cdot d \cdot \overline{b} + a \cdot b \cdot \overline{c} \cdot \overline{d} = c \cdot d + a \cdot b \cdot \overline{c}$

$c \cdot \overline{b} \cdot \overline{d} + a \cdot c \cdot d \cdot \overline{b} + a \cdot c \cdot \overline{b} \cdot \overline{d} + b \cdot d \cdot \overline{a} \cdot \overline{c} + b \cdot \overline{a} \cdot \overline{c} \cdot \overline{d} + c \cdot d \cdot \overline{a} \cdot \overline{b} + c \cdot \overline{a} \cdot \overline{b} \cdot \overline{d} = c \cdot \overline{b} + b \cdot \overline{a} \cdot \overline{c}$

$a \cdot b \cdot d + a \cdot d \cdot \overline{c} + a \cdot c \cdot d \cdot \overline{b} + b \cdot c \cdot d \cdot \overline{a} + b \cdot d \cdot \overline{a} \cdot \overline{c} = a \cdot d + b \cdot d$

$a \cdot b \cdot d + a \cdot b \cdot \overline{c} + b \cdot c \cdot d + a \cdot b \cdot c \cdot \overline{d} + a \cdot b \cdot \overline{c} \cdot \overline{d} + b \cdot c \cdot d \cdot \overline{a} = a \cdot b + b \cdot c \cdot d$

$a \cdot b \cdot d + a \cdot c \cdot \overline{d} + a \cdot \overline{b} \cdot \overline{d} + a \cdot b \cdot c \cdot d + a \cdot b \cdot \overline{c} \cdot \overline{d} = a \cdot b + a \cdot \overline{d}$

$a \cdot c \cdot d + b \cdot d \cdot \overline{a} + b \cdot d \cdot \overline{c} + c \cdot d \cdot \overline{b} + d \cdot \overline{a} \cdot \overline{b} + a \cdot b \cdot c \cdot d + a \cdot d \cdot \overline{b} \cdot \overline{c} + b \cdot c \cdot d \cdot \overline{a} + c \cdot \overline{a} \cdot \overline{b} \cdot \overline{d} = d + c \cdot \overline{a} \cdot \overline{b}$

$a \cdot b \cdot d + a \cdot \overline{b} \cdot \overline{d} + a \cdot b \cdot c \cdot \overline{d} + a \cdot b \cdot \overline{c} \cdot \overline{d} + a \cdot c \cdot d \cdot \overline{b} + a \cdot d \cdot \overline{b} \cdot \overline{c} + a \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} + b \cdot c \cdot d \cdot \overline{a} + b \cdot c \cdot \overline{a} \cdot \overline{d} + b \cdot \overline{a} \cdot \overline{c} \cdot \overline{d} + c \cdot d \cdot \overline{a} \cdot \overline{b} = a + b \cdot \overline{d} + c \cdot d$

$b \cdot \overline{a} \cdot \overline{d} + c \cdot d \cdot \overline{a} + c \cdot \overline{a} \cdot \overline{b} \cdot \overline{d} + \overline{a} \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} = c \cdot \overline{a} + \overline{a} \cdot \overline{d}$

$a \cdot b \cdot d + a \cdot b \cdot \overline{c} + b \cdot d \cdot \overline{a} \cdot \overline{c} + b \cdot \overline{a} \cdot \overline{c} \cdot \overline{d} = b \cdot \overline{c} + a \cdot b \cdot d$

$a \cdot \overline{b} \cdot \overline{c} + b \cdot c \cdot \overline{a} + b \cdot c \cdot \overline{d} + d \cdot \overline{b} \cdot \overline{c} + \overline{b} \cdot \overline{c} \cdot \overline{d} + a \cdot b \cdot c \cdot d + a \cdot d \cdot \overline{b} \cdot \overline{c} = b \cdot c + \overline{b} \cdot \overline{c}$

$a \cdot d \cdot \overline{c} + a \cdot \overline{b} \cdot \overline{c} + a \cdot b \cdot d \cdot \overline{c} + a \cdot b \cdot \overline{c} \cdot \overline{d} + b \cdot \overline{a} \cdot \overline{c} \cdot \overline{d} + \overline{a} \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} = a \cdot \overline{c} + \overline{c} \cdot \overline{d}$

Tableaux de Karnaugh

À partir de la table de vérité, utiliser la méthode du tableau de Karnaugh pour obtenir l'équation logique simplifiée.

a	b	c	s
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

$s =$

a	b	c	s
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

$s =$

a	b	c	s
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

$s =$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

$s =$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

$s =$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	0
0	0	1	0	1
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

$s =$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

$s =$

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	1
0	1	1	0	0
0	1	1	1	0
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

$s =$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	1	1	1

$s =$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	0
1	1	1	1	0

$s =$

Tableaux de Karnaugh (correction)

À partir de la table de vérité, utiliser la méthode du tableau de Karnaugh pour obtenir l'équation logique simplifiée.

a	b	c	s
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

$s = a \cdot c + b \cdot \overline{a}$

a	b	c	s
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

$s = b \cdot \overline{a} + \overline{b} \cdot \overline{c}$

a	b	c	s
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

$s = b \cdot c + \overline{a} \cdot \overline{c}$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

$s = c \cdot \overline{a} + c \cdot \overline{d} + a \cdot b \cdot \overline{c}$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

$$s = a \cdot \overline{b} + c \cdot \overline{b} + c \cdot d \cdot \overline{a}$$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	0
0	0	1	0	1
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

$$s = b \cdot c + c \cdot \overline{d} + \overline{a} \cdot \overline{d}$$

a	b	c	d	s
0	0	0	0	1
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

$$s = b \cdot c + \overline{b} \cdot \overline{c}$$

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	1
0	1	1	0	0
0	1	1	1	0
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

$$s = a \cdot b + a \cdot c + b \cdot d \cdot \overline{c}$$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	1	1	1

$$s = b \cdot d + d \cdot \overline{a} + d \cdot \overline{c}$$

a	b	c	d	s
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	0
1	1	1	1	0

$$s = a \cdot \overline{b} + a \cdot \overline{c} + c \cdot d \cdot \overline{b}$$

Conversions

Compléter les cases vides du tableau en convertissant entre les bases.

Binaire	Décimal	Hexadécimal
$1101_{(2)}$		
	$7_{(10)}$	
		$2_{(16)}$
$110100_{(2)}$		
	$21_{(10)}$	
		$10_{(16)}$
$10001_{(2)}$		
	$9_{(10)}$	
		$12_{(16)}$
$0_{(2)}$		
	$37_{(10)}$	
		$BC_{(16)}$
$1110001_{(2)}$		
	$378_{(10)}$	
		$A5_{(16)}$
$110001111_{(2)}$		
	$342_{(10)}$	
		$33_{(16)}$
$10101100_{(2)}$		
	$8628_{(10)}$	
		$1EF1_{(16)}$
$1000011111000_{(2)}$		
	$2289_{(10)}$	
		$1FE_{(16)}$
$110100110010_{(2)}$		
	$3678_{(10)}$	
		$F51_{(16)}$

Conversions (correction)

Compléter les cases vides du tableau en convertissant entre les bases.

Binaire	Décimal	Hexadécimal
$1101_{(2)}$	$13_{(10)}$	$D_{(16)}$
$111_{(2)}$	$7_{(10)}$	$7_{(16)}$
$10_{(2)}$	$2_{(10)}$	$2_{(16)}$
$110100_{(2)}$	$52_{(10)}$	$34_{(16)}$
$10101_{(2)}$	$21_{(10)}$	$15_{(16)}$
$10000_{(2)}$	$16_{(10)}$	$10_{(16)}$
$10001_{(2)}$	$17_{(10)}$	$11_{(16)}$
$1001_{(2)}$	$9_{(10)}$	$9_{(16)}$
$10010_{(2)}$	$18_{(10)}$	$12_{(16)}$
$0_{(2)}$	$0_{(10)}$	$0_{(16)}$
$100101_{(2)}$	$37_{(10)}$	$25_{(16)}$
$10111100_{(2)}$	$188_{(10)}$	$BC_{(16)}$
$1110001_{(2)}$	$113_{(10)}$	$71_{(16)}$
$101111010_{(2)}$	$378_{(10)}$	$17A_{(16)}$
$10100101_{(2)}$	$165_{(10)}$	$A5_{(16)}$
$110001111_{(2)}$	$399_{(10)}$	$18F_{(16)}$
$101010110_{(2)}$	$342_{(10)}$	$156_{(16)}$
$110011_{(2)}$	$51_{(10)}$	$33_{(16)}$
$10101100_{(2)}$	$172_{(10)}$	$AC_{(16)}$
$10000110110100_{(2)}$	$8628_{(10)}$	$21B4_{(16)}$
$1111011110001_{(2)}$	$7921_{(10)}$	$1EF1_{(16)}$
$1000011111000_{(2)}$	$4344_{(10)}$	$10F8_{(16)}$
$100011110001_{(2)}$	$2289_{(10)}$	$8F1_{(16)}$
$111111110_{(2)}$	$510_{(10)}$	$1FE_{(16)}$
$110100110010_{(2)}$	$3378_{(10)}$	$D32_{(16)}$
$111001011110_{(2)}$	$3678_{(10)}$	$E5E_{(16)}$
$111101010001_{(2)}$	$3921_{(10)}$	$F51_{(16)}$

Nombres binaires signés

Compléter les cases vides du tableau en utilisant si nécessaire la méthode du complément à deux.

Binaire signé sur 8 bits	Décimal signé
01111011	
	-42
11111010	
	0
10010101	
	-112
10101111	
	31
00001010	
	-1
01110111	
	53
00110000	
	-31
11111100	
	-55
00000110	
	-128
01011110	
	127
11000001	
	106
10111001	
	45
11110101	
	36
00001100	
	97
11100000	
	-101

Nombres binaires signés (correction)

Compléter les cases vides du tableau en utilisant si nécessaire la méthode du complément à deux.

Binaire signé sur 8 bits	Décimal signé
01111011	123
11010110	-42
11111010	-6
00000000	0
10010101	-107
10010000	-112
10101111	-81
00011111	31
00001010	10
11111111	-1
01110111	119
00110101	53
00110000	48
11100001	-31
11111100	-4
11001001	-55
00000110	6
10000000	-128
01011110	94
01111111	127
11000001	-63
01101010	106
10111001	-71
00101101	45
11110101	-11
00100100	36
00001100	12
01100001	97
11100000	-32
10011011	-101