Codification et Représentation de l'Information (CRI)

MI – USTHB – TD série N°3

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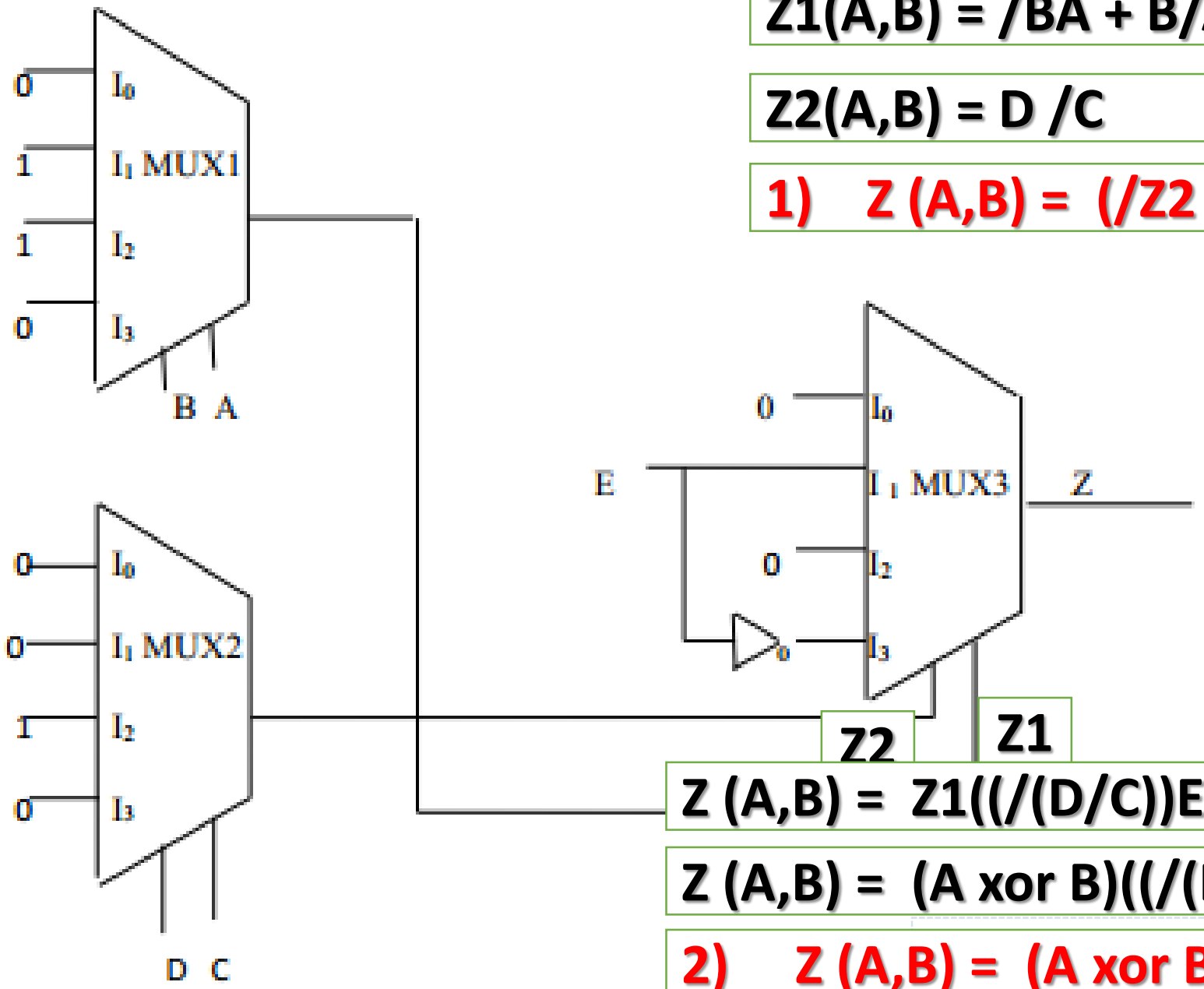
Exercice 4



$Z1(A,B) = /BA + B/A = A \text{ xor } B$

$Z2(A,B) = D\ /C$

1) $Z(A,B) = (/Z2\ Z1)E + (Z2\ Z1)/E$

$Z(A,B) = Z1((/(D/C))E + (D/C)/E)$

$Z(A,B) = (A \text{ xor } B)((/(D/C))E + (D/C)/E)$

2) $Z(A,B) = (A \text{ xor } B)(D/C \text{ xor } E)$

Exercice 4

Z(A,B,C,D,E) =

Exercice 4

$Z(A,B,C,D,E) = (D\overline{C} \oplus E)(A \oplus B)$

E0 = Z(A,B,0,0,0) = A

E1 = Z(A,B,0,0,1) = $(A \oplus B)$

E2 = Z(A,B,0,1,0) = $(A \oplus B)$

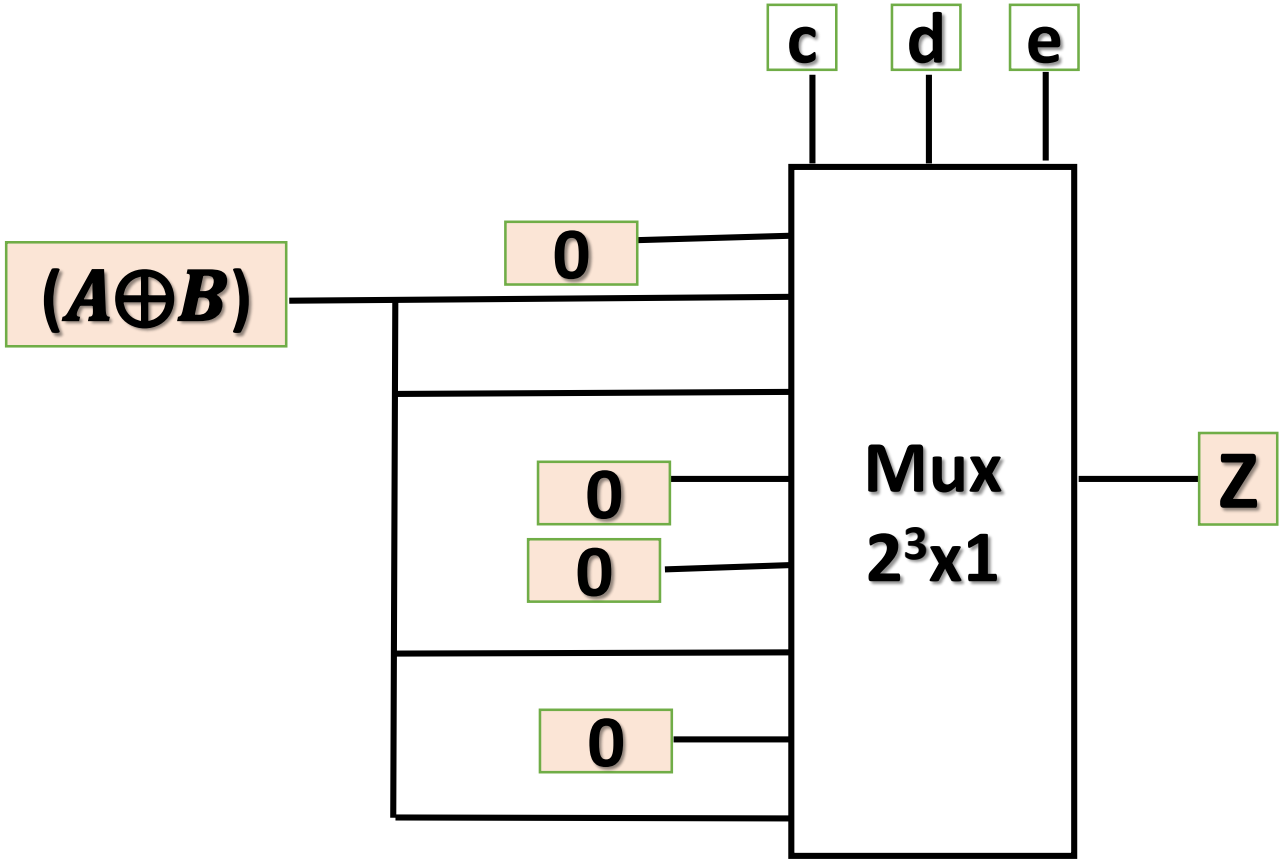
E3 = Z(A,B,0,1,1) = 0

E4 = Z(A,B,1,0,0) = 0

E5 = Z(A,B,1,0,1) = $(A \oplus B)$

E6 = Z(A,B,1,1,0) = 0

E7 = Z(A,B,1,1,1) = $(A \oplus B)$



Exercice 5

A	B	C	D	X	Y	Z
0	0	0	0	0	0	1
0	0	0	1	0	0	1
0	0	1	0	0	0	1
0	0	1	1	0	0	1
0	1	0	0	0	0	1
0	1	0	1	0	0	1
0	1	1	0	0	0	1
0	1	1	1	0	1	0
1	0	0	0	0	1	0
1	0	0	1	0	1	0
1	0	1	0	0	1	0
1	0	1	1	1	0	0
1	1	0	0	0	1	0
1	1	0	1	1	0	0
1	1	1	0	1	0	0
1	1	1	1	1	0	0

Exo 5

A	B	C	D	X	Y	Z
0	0	0	0	0	0	1
0	0	0	1	0	0	1
0	0	1	0	0	0	1
0	0	1	1	0	0	1
0	1	0	0	0	0	1
0	1	0	1	0	0	1
0	1	1	0	0	0	1
0	1	1	1	0	1	0
1	0	0	0	0	1	0
1	0	0	1	0	1	0
1	0	1	0	0	1	0
1	0	1	1	1	0	0
1	1	0	0	0	1	0
1	1	0	1	1	0	0
1	1	1	0	1	0	0
1	1	1	1	1	0	0

ab / cd	00	01	11	10
00	0	0	0	0
01	0	0	1	0
11	0	0	1	1
10	0	0	1	0

X(A,B,C,D) = abd + abc +acd

Exo 5

A	B	C	D	X	Y	Z
0	0	0	0			1
0	0	0	1			1
0	0	1	0			1
0	0	1	1			1
0	1	0	0			1
0	1	0	1			1
0	1	1	0			1
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		1	
1						
1						
1	1	1	1	1		

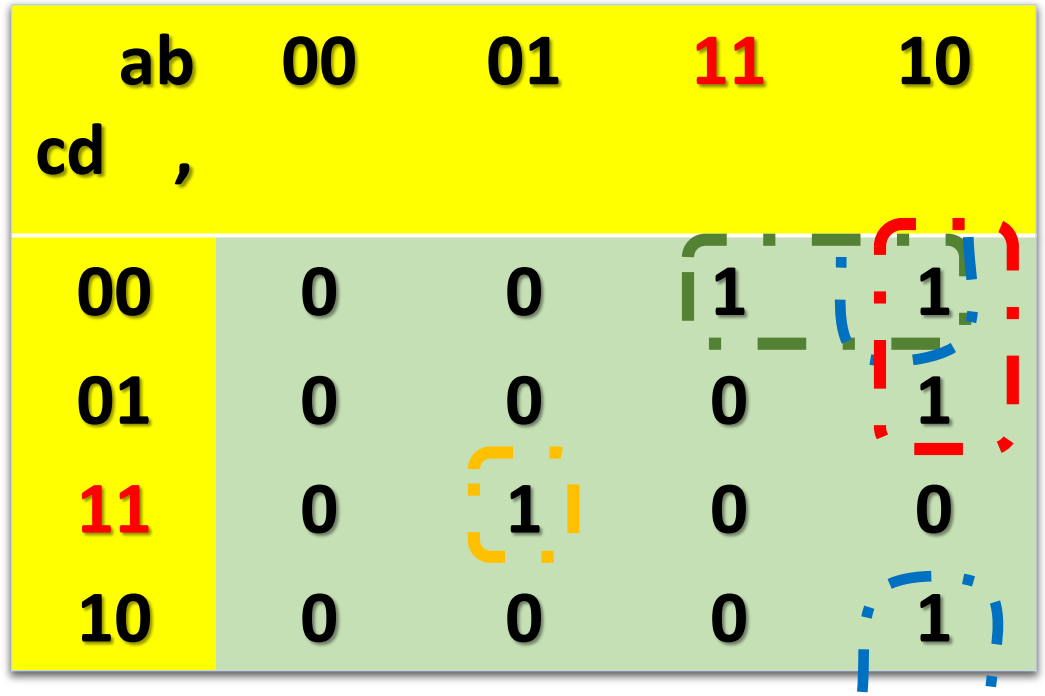
AB / CD	00	01	11	10
00	0	0	0	0
01	0	0	1	0
11	0	0	1	1
10	0	0	1	0

$$X(A,B,C,D) = ABD + ABC + ACD$$

Exo 5

A	B	C	D	X	Y	Z
0	0	0	0	0	0	1
0	0	0	1	0	0	1
0	0	1	0	0	0	1
0	0	1	1	0	0	1
0	1	0	0	0	0	1
0	1	0	1	0	0	1
0	1	1	0	0	0	1
0	1	1	1	0	1	0
1	0	0	0	0	1	0
1	0	0	1	0	1	0
1	0	1	0	0	1	0
1	0	1	1	1	0	0
1	1	0	0	0	1	0
1	1	0	1	1	0	0
1	1	1	0	1	0	0
1	1	1	1	1	0	0

ab / cd	00	01	11	10
00	0	0	1	1
01	0	0	0	1
11	0	1	0	0
10	0	0	0	1



$$Y(A,B,C,D) = /abcd + a/c/d + a/b/c + a/b/d$$

Exo 5

A	B	C	D	X	Y	Z
0	0	0	0			1
0	0	0	1			1
0	0	1	0			1
0	0	1	1			1
0	1	0	0			1
0	1	0	1			1
0	1	1	0			1
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		1	
1	1	1	1	1		

AB / CD	00	01	11	10
00	0	0	1	1
01	0	0	0	1
11	0	1	0	0
10	0	0	0	1

$$Y(A,B,C,D) = A\overline{C}\overline{D} + A\overline{B}\overline{C} + A\overline{B}\overline{D} + \overline{A}BCD$$

Exo 5

A	B	C	D	X	Y	Z
0	0	0	0	0	0	1
0	0	0	1	0	0	1
0	0	1	0	0	0	1
0	0	1	1	0	0	1
0	1	0	0	0	0	1
0	1	0	1	0	0	1
0	1	1	0	0	0	1
0	1	1	1	0	1	0
1	0	0	0	0	1	0
1	0	0	1	0	1	0
1	0	1	0	0	1	0
1	0	1				
1	1	0				
1	1	0				
1	1	1				
1	1	1				

ab / cd	00	01	11	10
00	1	1	0	0
01	1	1	0	0
11	1	0	0	0
				0

$\overline{Z}$(A,B,C,D) = a+ bcd

Z(A,B,C,D) = /a (/b+/c+/d)

$$Z(A,B,C,D) = \overline{a + (\overline{\overline{bb} + \overline{cc} + \overline{dd}})}$$

Exo 5

A	B	C	D	X	Y	Z
0	0	0	0			1
0	0	0	1			1
0	0	1	0			1
0	0	1	1			1
0	1	0	0			1
0	1	0	1			1
0	1	1	0			1
0	1	1	1		1	
1	0	0	0		1	
1	0	0	1		1	
1	0	1	0		1	
1						
1						
1	1	0	1	1		
1						
1						

AB / CD	00	01	11	10
00	1	1	0	0
01	1	1	0	0
11	1	0	0	0
10	1	1	0	0

$$/Z(A,B,C,D) = A + BCD$$

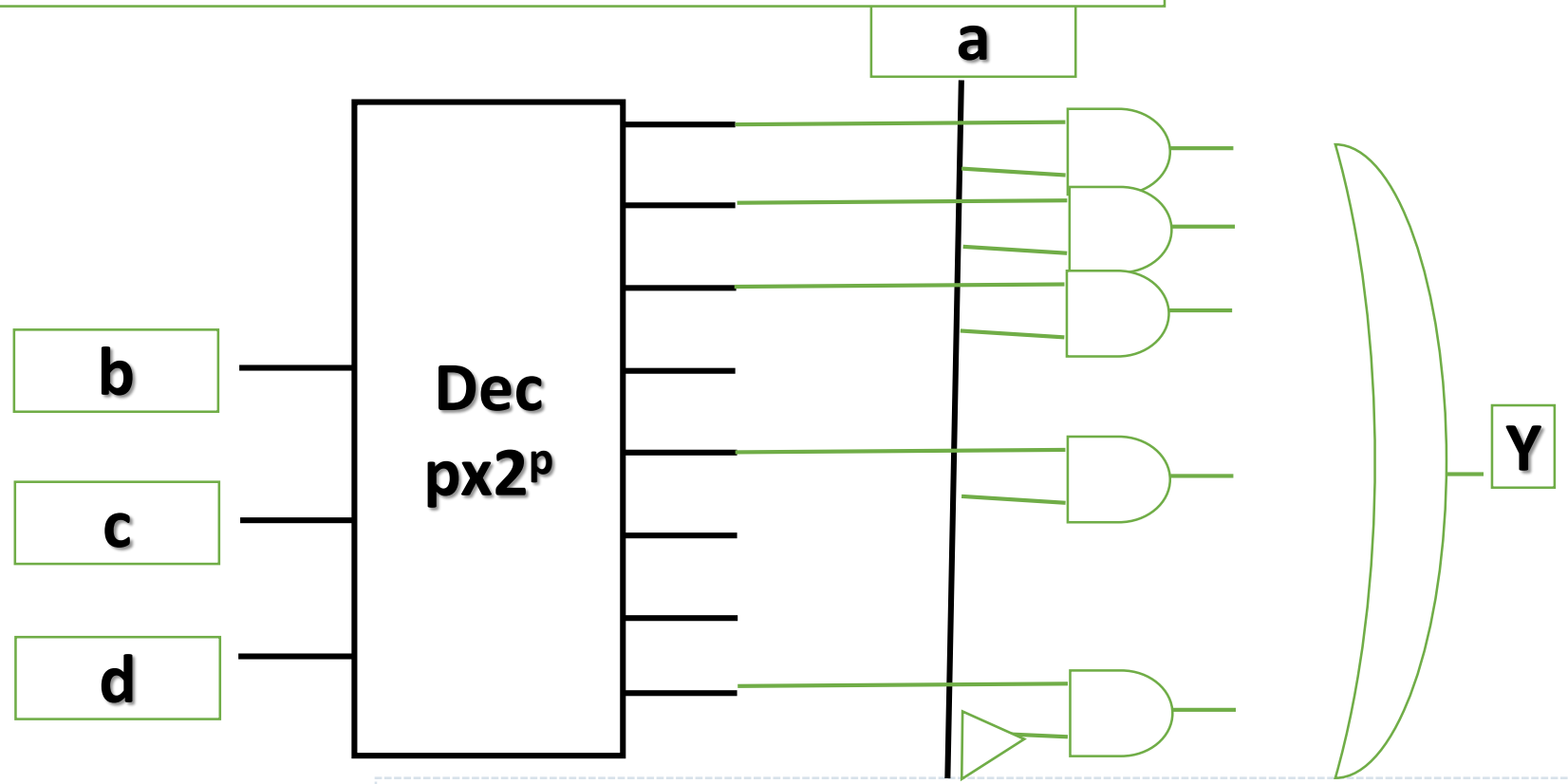
$$Z(A,B,C,D) = \overline{A}\,(\overline{B}+\overline{C}+\overline{D})$$

Y(A,B,C,D) = /abcd + a/c/d(b+/b) + a/b/c (d+/d) + a/b/d (c + /c)

Y(A,B,C,D) = /abcd + a/c/db+a/c/d/b + a/b/c d+ a/b/c /d) + a/b/d c + a/b/d /c)

Y(A,B,C,D) = /abcd + a/c/db+a/c/d/b + a/b/c d + a/b/d c

111 100 000 001 010



Exercice 5

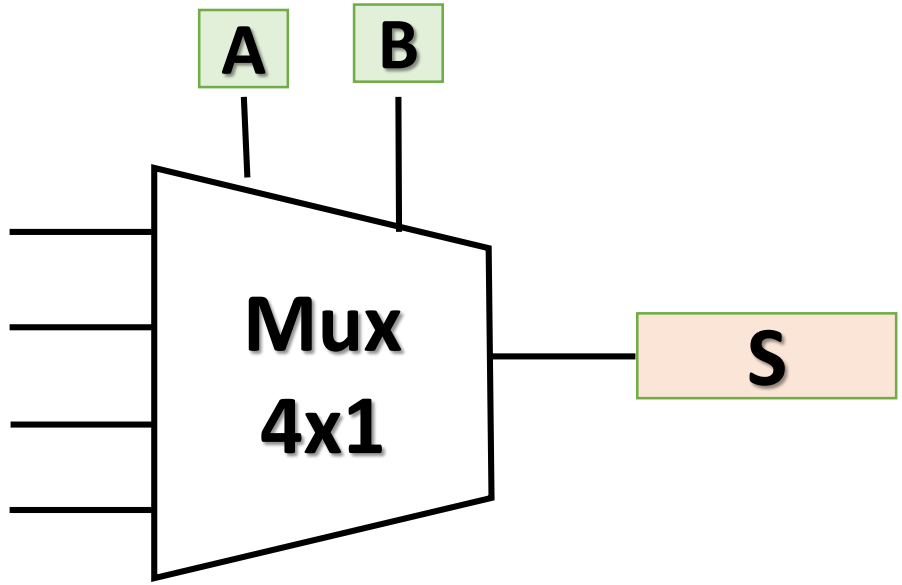
$$Y(A,B,C,D) = A\overline{C}\,\overline{D} + A\overline{B}\,\overline{C} + A\overline{B}\,\overline{D} + \overline{A}BCD$$

$E_0 = Y(0,0,C,D) = 0$

$E_1 = Y(0,1,C,D) = CD$

$E_2 = Y(1,0,C,D) = \cancel{/c/d} + /c + /d = /c + /d$

$E_3 = Y(1,1,C,D) = /c/d$



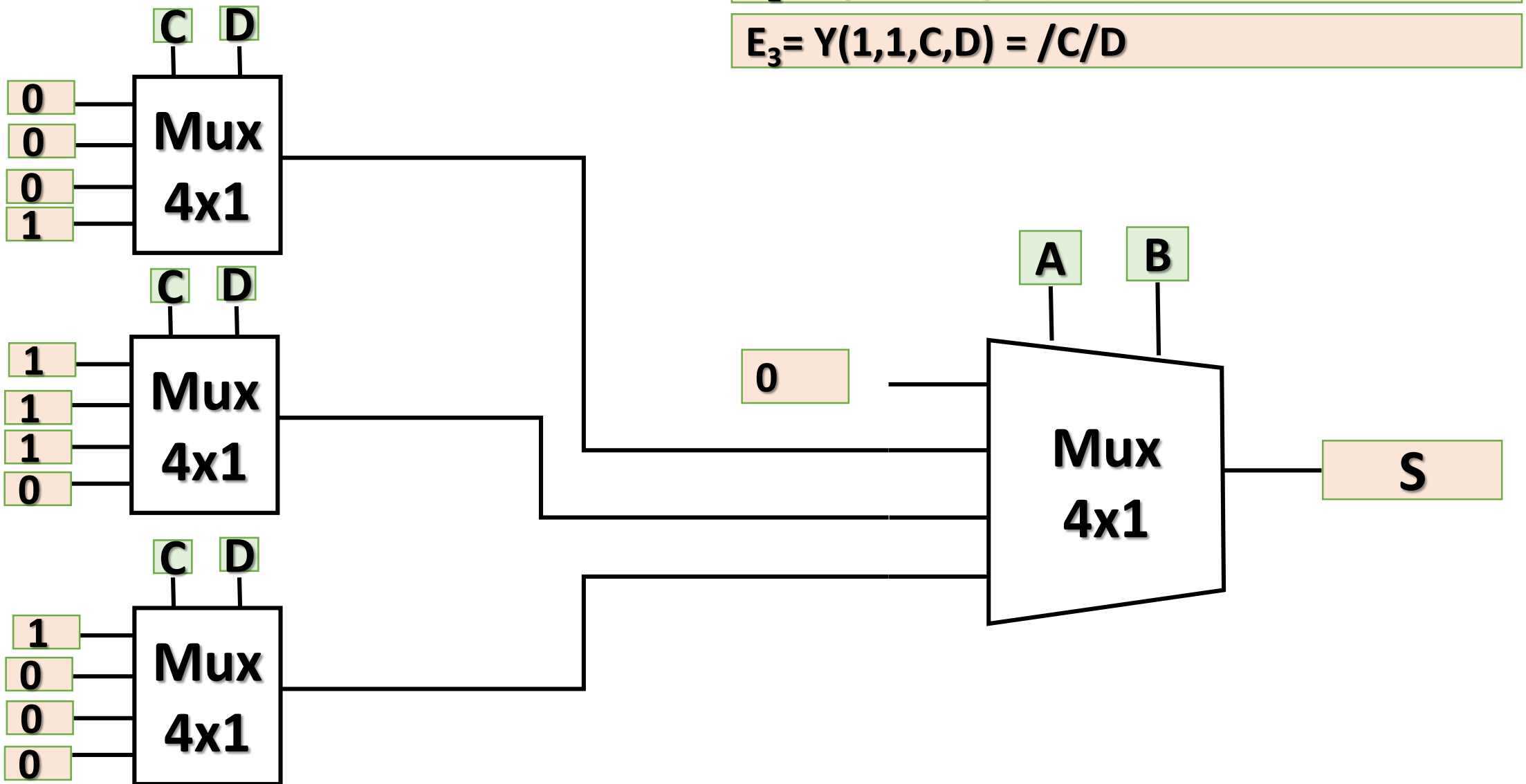
Exercice 5

E_0= Y(0,0,C,D) = 0

E_1= Y(0,1,C,D) = CD

E_2= Y(1,0,C,D) = /C + /D

E_3= Y(1,1,C,D) = /C/D



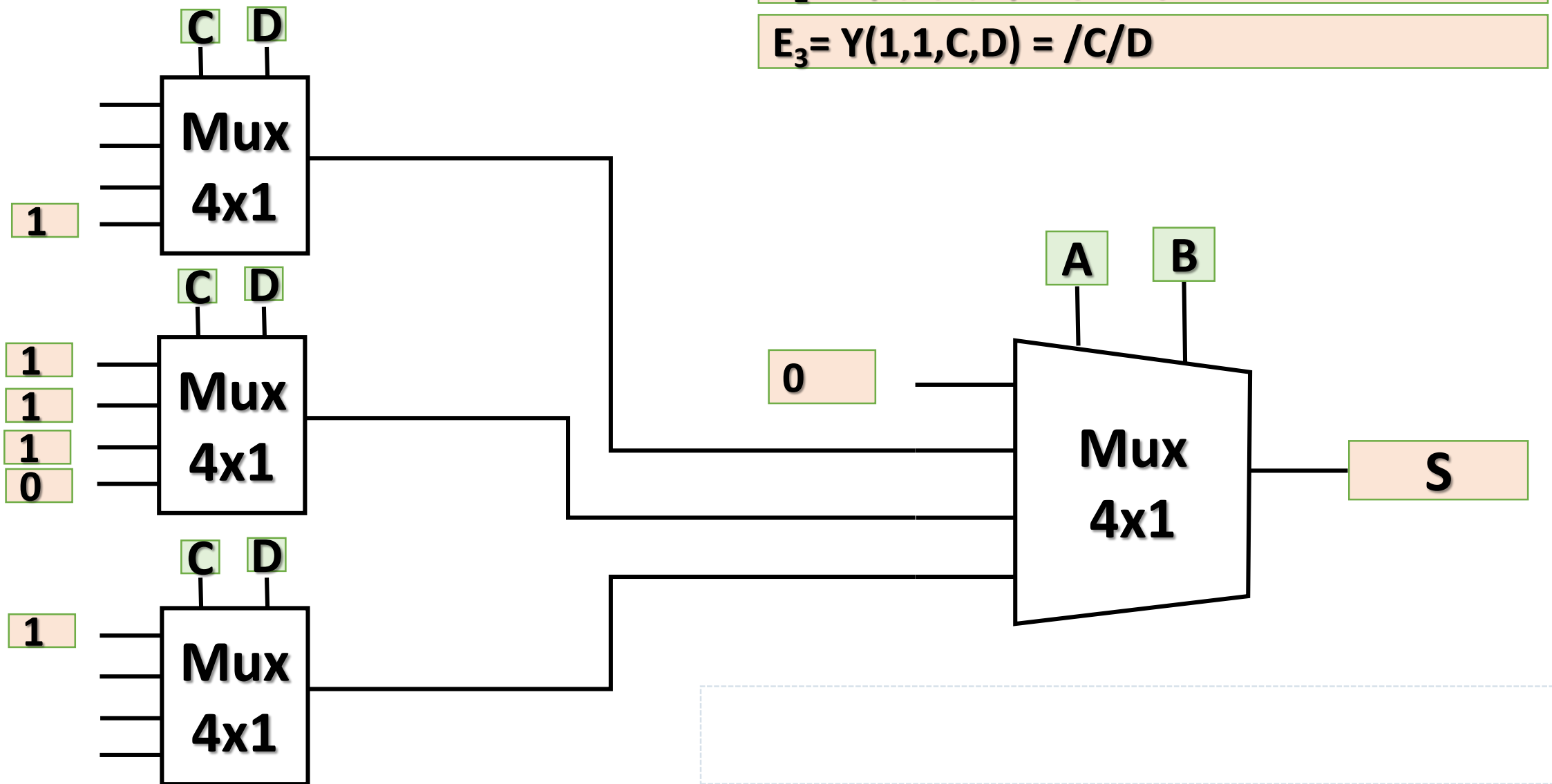
Exercice 5

E_0= Y(0,0,C,D) = 0

E_1= Y(0,1,C,D) = CD

E_2= Y(1,0,C,D) = /C + /D

E_3= Y(1,1,C,D) = /C/D



Exercice 6

G		D			
A	B	C	D	Fg	Fd
0	0	0	0	0	0
0	0	0	1	0	1
0	0	1	0	0	1
0	0	1	1	0	1
0	1	0	0	1	0
0	1	0	1	0	0
0	1	1	0	0	1
0	1	1	1	0	1
1	0	0	0	1	0
1	0	0	1	1	0
1	0	1	0	0	0
1	0	1	1	0	1
1	1	0	0	1	0
1	1	0	1	1	0
1	1	1	0	1	0
1	1	1	1	0	0

Exercice 6

G		D			
A	B	C	D	Fg	Fd
0	0	0	0	0	0
0	0	0	1	0	1
0	0	1	0	0	1
0	0	1	1	0	1
0	1	0	0	1	0
0	1	0	1	0	0
0	1	1	0	0	1
0	1	1	1	0	1
1	0	0	0	1	0
1	0	0	1	1	0
1	0	1	0	0	0
1	0	1	1	0	1
1	1	0	0	1	0
1	1	0	1	1	0
1	1	1	0	1	0
1	1	1	1	0	0

ab / cd	00	01	11	10
00	0	1	1	1
01	0	0	1	1
11	0	0	0	0
10	0	0	1	0

$$Fg(A,B,C,D) = a/c + b/c/d + ab/d$$

Exercice 6

G		D			
A	B	C	D	Fg	Fd
0	0	0	0	0	0
0	0	0	1	0	1
0	0	1	0	0	1
0	0	1	1	0	1
0	1	0	0	1	0
0	1	0	1	0	0
0	1	1	0	0	1
0	1	1	1	0	1
1	0	0	0	1	0
1	0	0	1	1	0
1	0	1	0	0	0
1	0	1	1	0	1
1	1	0	0	1	0
1	1	0	1	1	0
1	1	1	0	1	0
1	1	1	1	0	0

ab / cd	00	01	11	10
00	0	1	1	1
01	0	0	1	1
11	0	0	0	0
10	0	0	1	0

$$Fg(A,B,C,D) = a/c + b/c/d + ab/d$$

G		D			
A	B	C	D	Fg	Fd
0	0	0	0	0	0
0	0	0	1	0	1
0	0	1	0	0	1
0	0	1	1	0	1
0	1	0	0	1	0
0	1	0	1	0	0
0	1	1	0	0	1
0	1	1	1	0	1
1	0	0	0	1	0
1	0	0	1	1	0
1	0	1	0	0	0
1	0	1	1	0	1
1	1	0	0	1	0
1	1	0	1	1	0
1	1	1	0	1	0
1	1	1	1	0	0

Exercice 6

ab cd ,	00	01	11	10
00	0	0	0	0
01	1	0	0	0
11	1	1	0	1
10	1	1	0	0

Fd(A,B,C,D) = /ac + /a/bd + /bcd

Exercice 6

G		D			
A	B	C	D	Fg	Fd
0	0	0	0	0	0
0	0	0	1	0	1
0	0	1	0	0	1
0	0	1	1	0	1
0	1	0	0	1	0
0	1	0	1	0	0
0	1	1	0	0	1
0	1	1	1	0	1
1	0	0	0	1	0
1	0	0	1	1	0
1	0	1	0	0	0
1	0	1	1	0	1
1	1	0	0	1	0
1	1	0	1	1	0
1	1	1	0	1	0
1	1	1	1	0	0

ab cd ,	00	01	11	10
00	0	0	0	0
01	1	0	0	0
11	1	1	0	1
10	1	1	0	0

Fd(A,B,C,D) = /ac + /a/bd + /bcd

Exercice 6

Fg(A,B,C,D) = a/c + b/c/d + ab/d

Fg(A,B,C,D) = $\overline{\overline{A}\overline{C}} \quad \overline{B\overline{C}\overline{D}} \quad \overline{AB\,\overline{D}}$

Fg(A,B,C,D) = $\overline{\overline{A\overline{C}\overline{C}} \quad \overline{B\overline{C}\overline{C}\,\overline{D}\overline{D}} \quad \overline{AB\,\overline{D}\overline{D}}}$

Fg(A,B,C,D) = a/c + b/c/d + ab/d

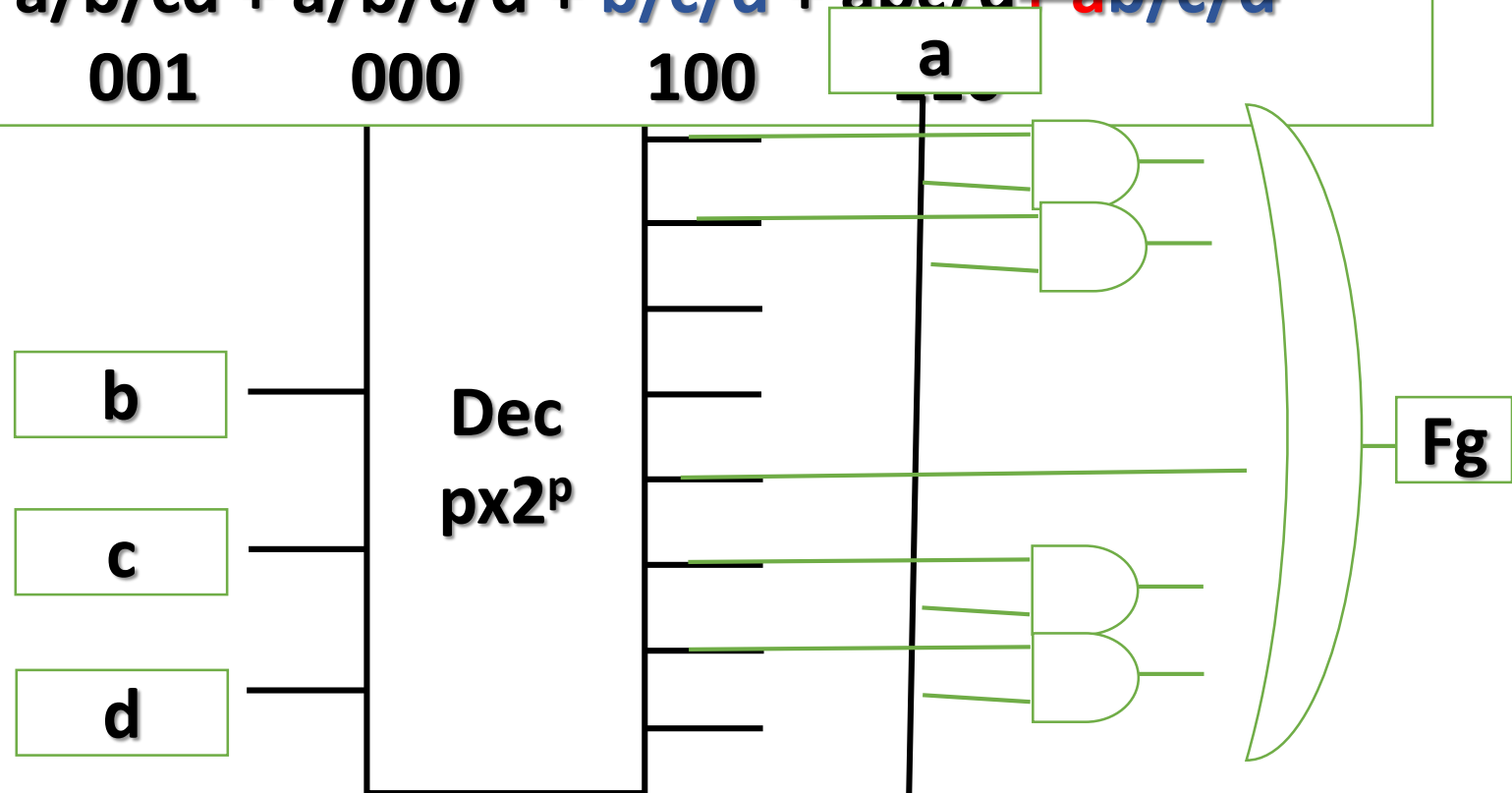
Fg(A,B,C,D) = a/c (b+/b)(d+/d) + b/c/d + ab/d (c+/c)

Fg(A,B,C,D) = a/cbd + a/cb/d + a/c/bd + a/c/b/d + b/c/d + ab/dc+ ab/d /c)

Fg(A,B,C,D) = ab/cd + ab/c/d + a/b/cd + a/b/c/d + b/c/d + abc/d+ ab/c/d

Fg(A,B,C,D) = ab/cd + ~~ab/c/d~~ + a/b/cd + a/b/c/d + b/c/d + abc/d~~+ ab/c/d~~

101 100 001 000 100



Exercice 6

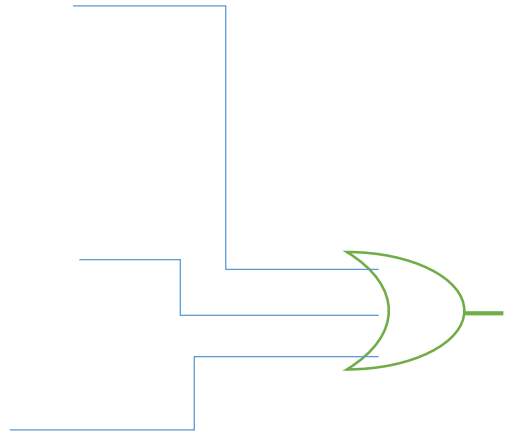
$Fg(A,B,C,D) = a/c + b/c/d + ab/d$

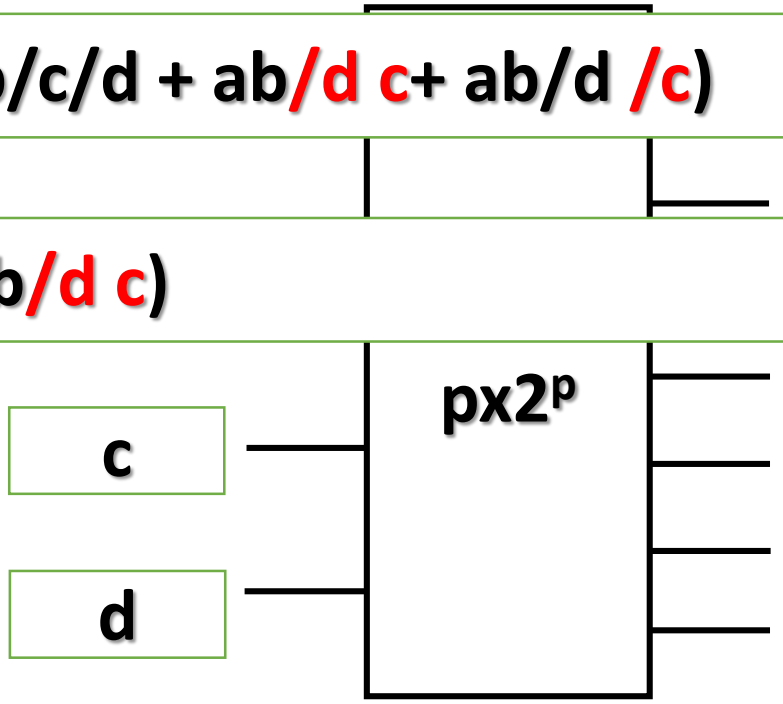
$Fg(A,B,C,D) = a/c\ (b+/b) + b/c/d + ab/d\ (c+/c)$

$Fg(A,B,C,D) = a/c\ (b+/b)(d+/d) + b/c/d + ab/d\ (c+/c)$

$Fg(A,B,C,D) = a/c\ bd + a/cb/d + a/c/bd + a/c/b/d + b/c/d + ab/d\ c + ab/d\ /c)$

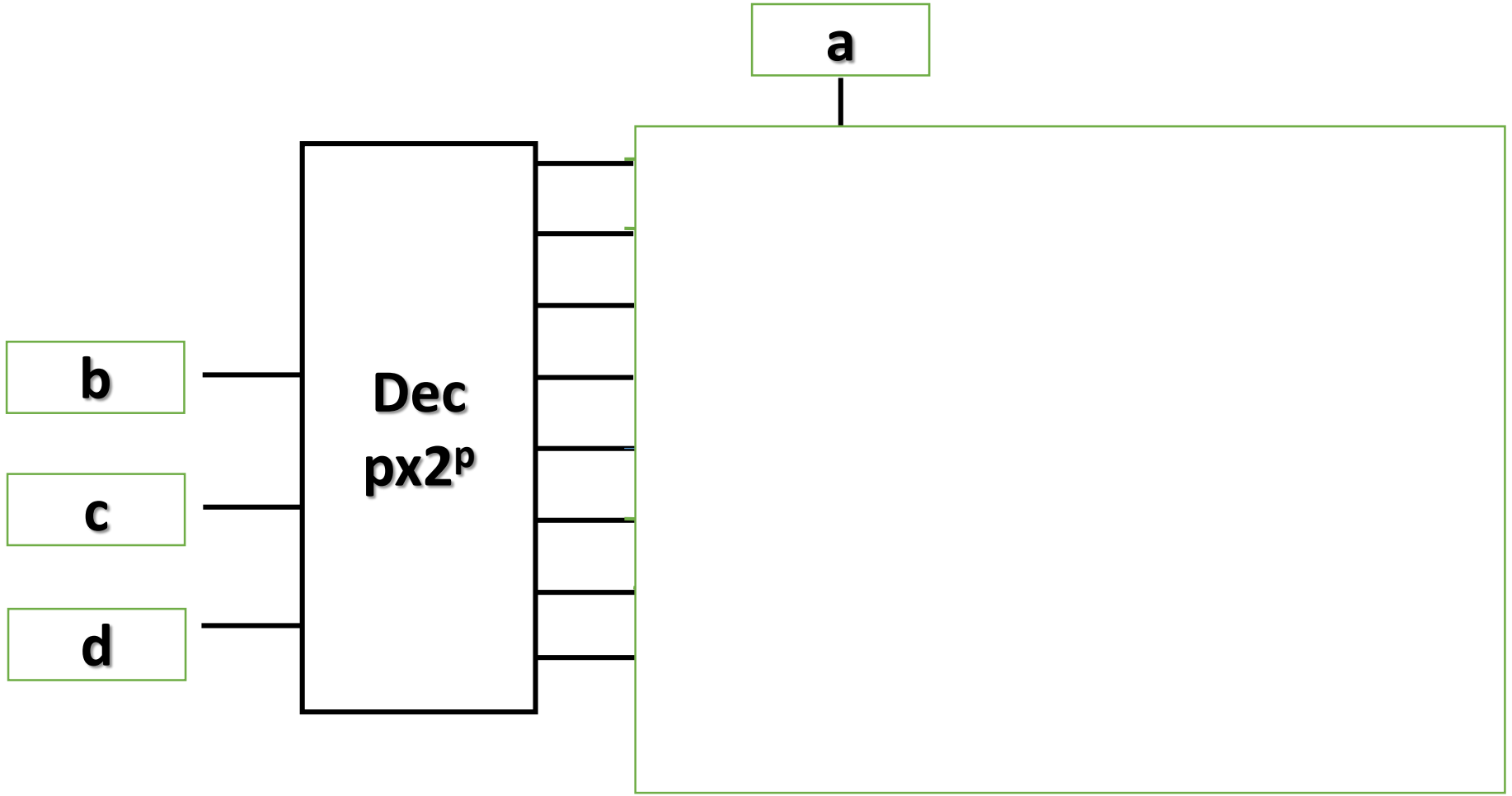
$Fg(A,B,C,D) = a/cbd + a/c/bd + a/c/b/d + b/c/d + ab/d\ c)$





Exercice 6

Fg(A,B,C,D) = a/cbd + a/c/bd + a/c/b/d + b/c/d + ab/d c)



Exercice 6

A + AB= A

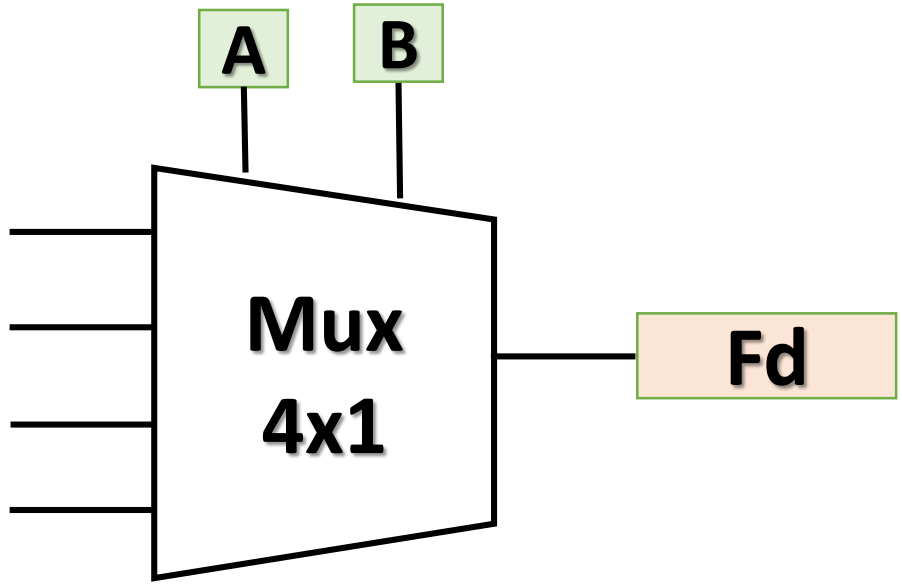
Fd(A,B,C,D) = /ac + /a/bd + /bcd

E_0= Y(0,0,C,D) = C + D ~~+ CD~~

E_1= Y(0,1,C,D) = C

E_2= Y(1,0,C,D) = CD

E_3= Y(1,1,C,D) = 0



Exercice 6

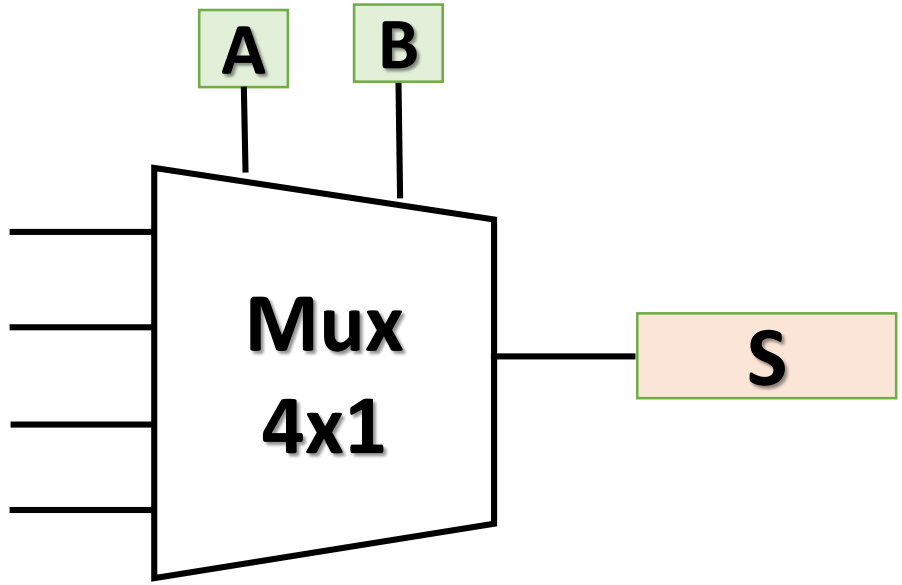
Fd(A,B,C,D) = /ac + /a/bd + /bcd

E_0= Y(0,0,C,D) = c +d

E_1= Y(0,1,C,D) = c

E_2= Y(1,0,C,D) = cd

E_3= Y(1,1,C,D) = 0



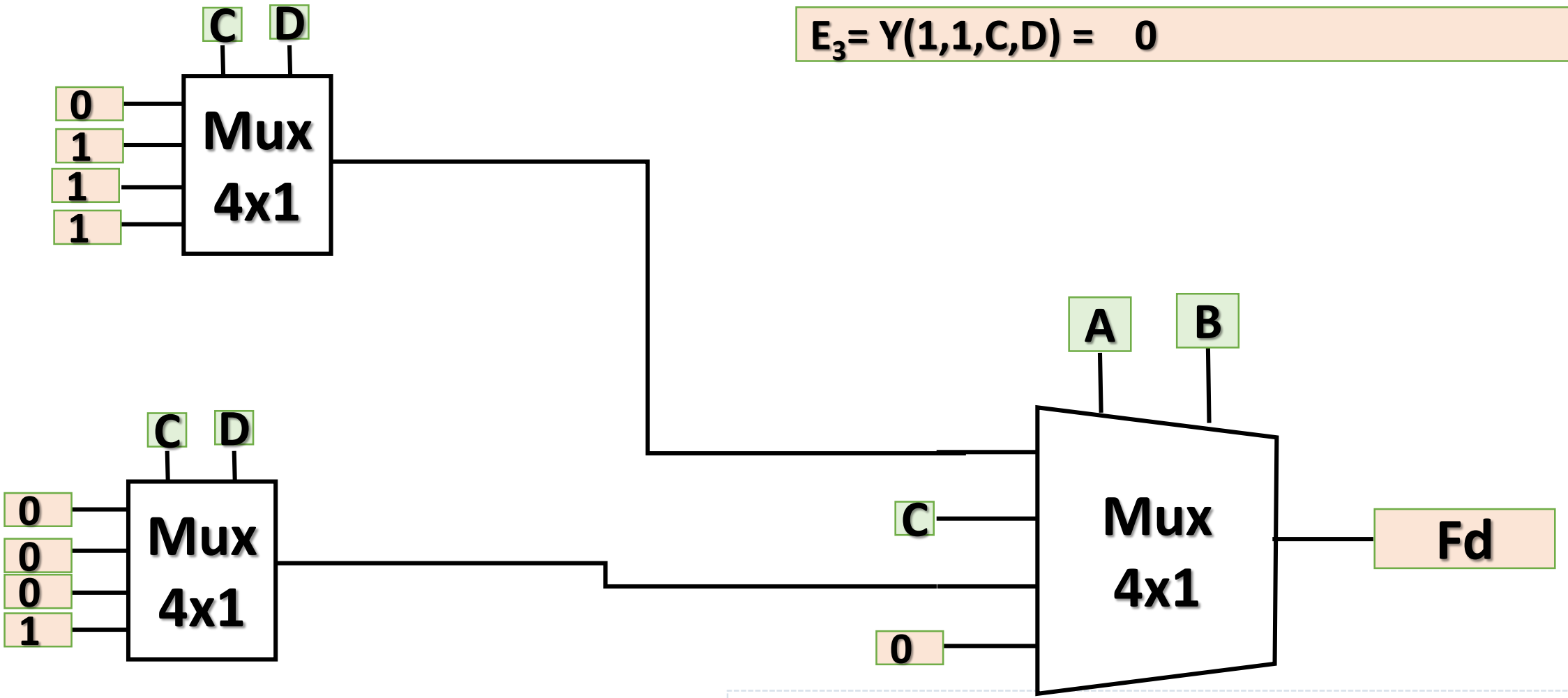
Exercice 6

E_0= Y(0,0,C,D) = c +d

E_1= Y(0,1,C,D) = c

E_2= Y(1,0,C,D) = cd

E_3= Y(1,1,C,D) = 0



Exercice 6

E_0= Y(0,0,C,D) = c +d

E_1= Y(0,1,C,D) = c

E_2= Y(1,0,C,D) = cd

E_3= Y(1,1,C,D) = 0

6) Un Mux 4x1 et des portes logiques