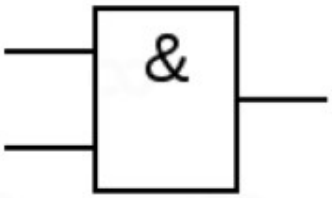
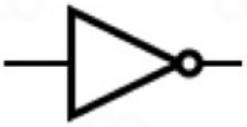
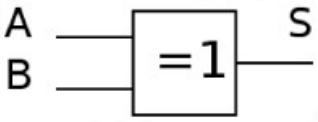
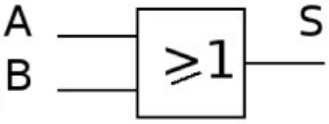
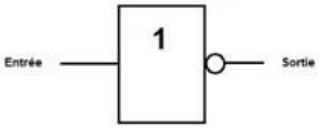
Nom & Prénom : ……

Devoir surveillé : Portes logiques

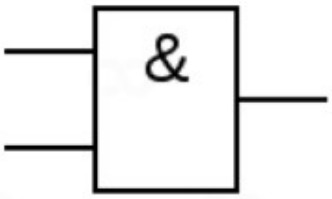
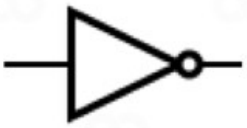
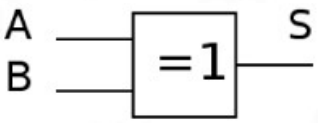
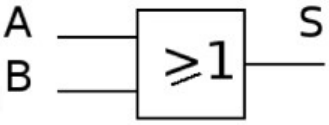
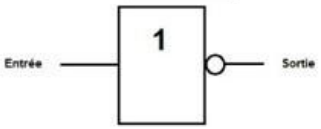
Partie 1 Vous avez cinq minutes pour relier correctement les Items du tableau

Notation américaine		Type de porte		Notation européenne
		NOT		
		AND		
		OR		
		XOR		

Nom & Prénom : ……

Devoir surveillé : Portes logiques

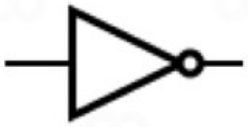
Cours Partie 1 Vous avez cinq minutes pour relier correctement les Items du tableau

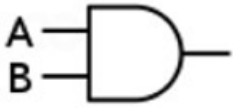
Notation américaine		Type de porte		Notation européenne
		NOT		
		AND		
		OR		
		XOR		

Nom & Prénom : ……

Devoir surveillé : Portes logiques

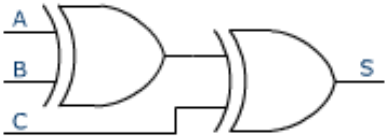
Cours Partie 2 Dresser les tables de vérité des portes suivantes :

Type de porte	Table de vérité
Not 	A | Sortie 1 | 0 |
OR 	A | B | Sortie 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |

Type de porte	Table de vérité
AND 	A | B | Sortie 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
XOR 	A | B | Sortie 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |

Exercice d'application

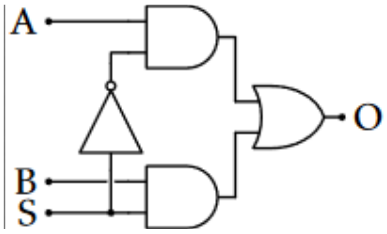
1) Donner l'expression booléenne de S



……

2) Au dos tracer le circuit correspondant à l'expression booléenne : S=(e_0 XOR i_0) AND (e_1 XOR i_1)

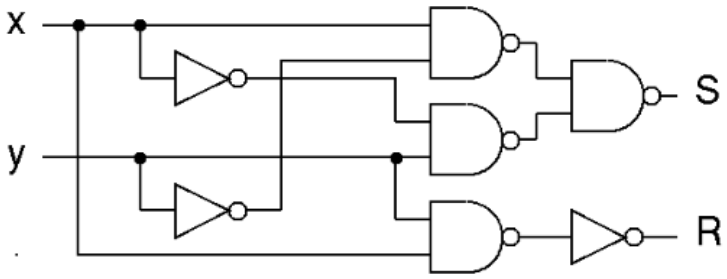
3) Dresser la table de vérité des circuits-ci-dessous, puis déterminer son expression booléenne.



A	B	S	O
0	0		
0	1		
1	0		
1	1		
0	0		
0	1		
1	0		
1	1		

……

4) Donner la table de vérité du circuit ci-contre :

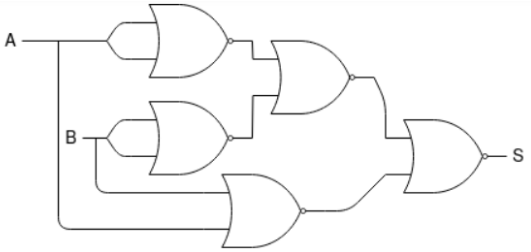


X	Y	S	R
0	0		
0	1		
1	0		
1	1		

Déduire de la table de vérité une version largement plus simple du circuit à tracer ci-dessous.

Bonus : quelle est l'utilité d'un tel circuit ?

5) Après avoir donné la table de vérité du circuit en déduire à quelle porte de base est il équivalent :

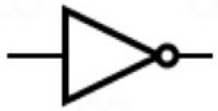
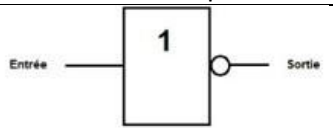
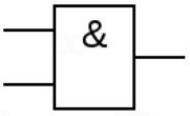
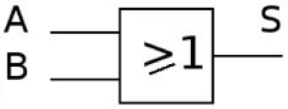
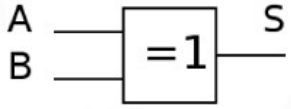


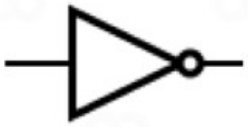
……

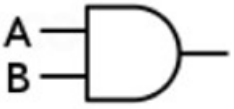
Correction Devoir surveillé : Portes logiques

Cours Partie 1

Cours Partie 2 Dresser les tables de vérité des portes suivantes :

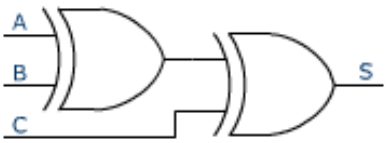
Notation américaine	Type de porte	Notation européenne
	NOT	
	AND	
	OR	
	XOR	

Type de porte	Table de vérité
Not 	A | Non A , Ā 1 | 0 0 | 1
OR 	A | B | A **OU** B 0 | 0 | 0 0 | 1 | 1 1 | 0 | 1 1 | 1 | 1

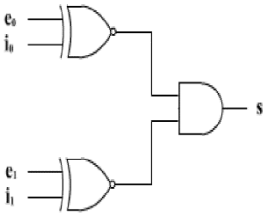
Type de porte	Table de vérité
AND 	A | B | A **ET** B 0 | 0 | 0 0 | 1 | 0 1 | 0 | 0 1 | 1 | 1
XOR 	A | B | A **XOR** B 0 | 0 | 0 0 | 1 | 1 1 | 0 | 1 1 | 1 | 0

Exercice d'application

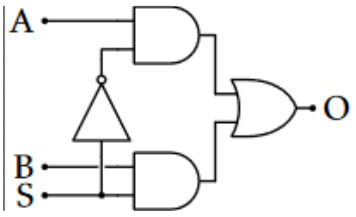
1) Pour chaque circuit donner l'expression booléenne de S



S= C XOR (A XOR B)

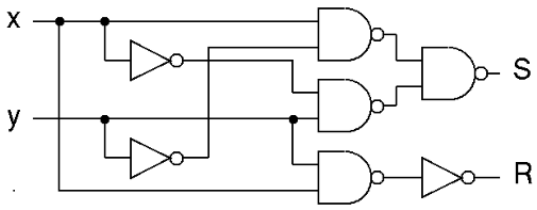
2) 

S=(e_0 XOR i_0) AND (e_1 XOR i_1)

3) . 

Expression booléenne : (A et Non(S)) ou (B et S)

A	B	S	O
0	0	0	0
0	1	0	0
1	0	0	1
1	1	0	1
0	0	1	0
0	1	1	1
1	0	1	0
1	1	1	1

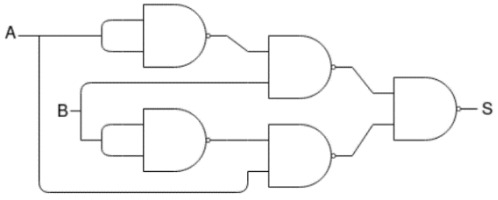


4) S=x XOR y. R = x AND y

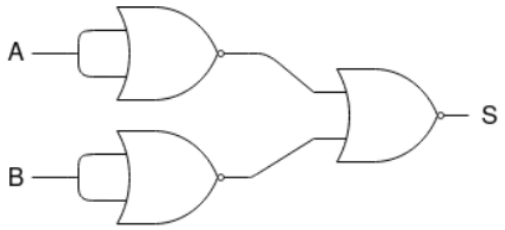
Bonus : C'est un demi additionneur (pas de retenue à l'entrée il est idéal pour faire l'addition du chiffre des unités.

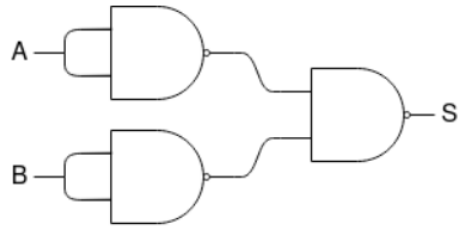
x	y	S	R
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

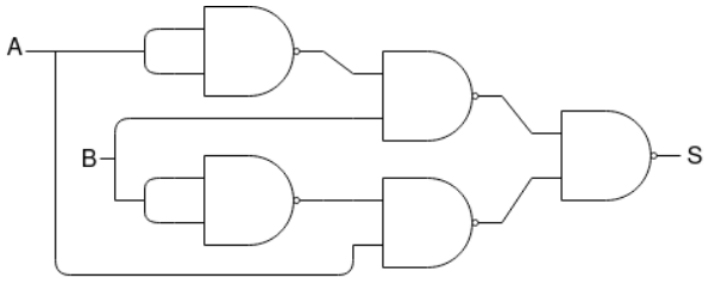
5) (table de vérité voir tableau cours partie 2)



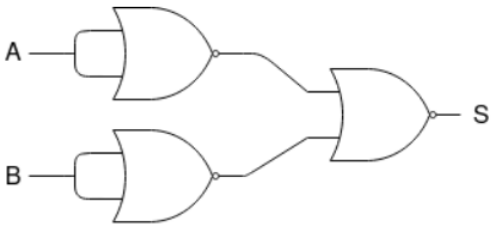
Circuit Porte XOR avec NAND



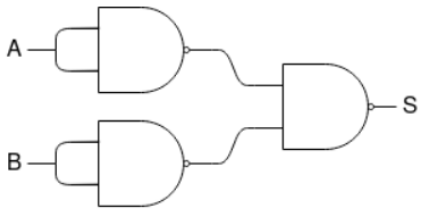




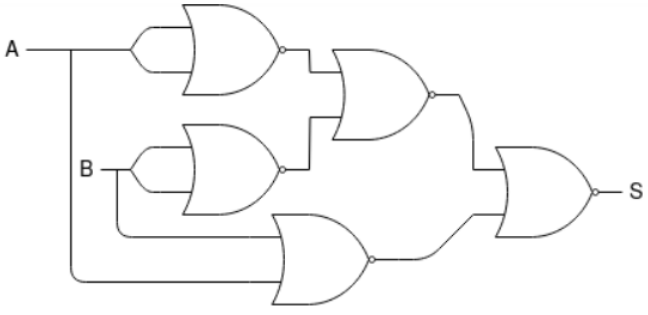
correction



Circuit Porte AND



Circuit Porte OR



Circuit Porte XOR
avec des NOR