



Université Mohammed V de Rabat  
Faculté des sciences

SMI Semestre 3

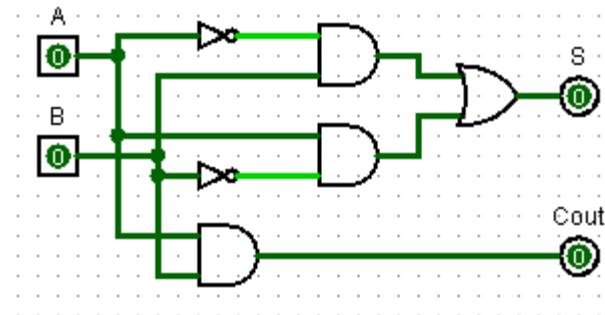
Module: Electronique

# TP 3: Opérations arithmétiques et drapeaux d'état

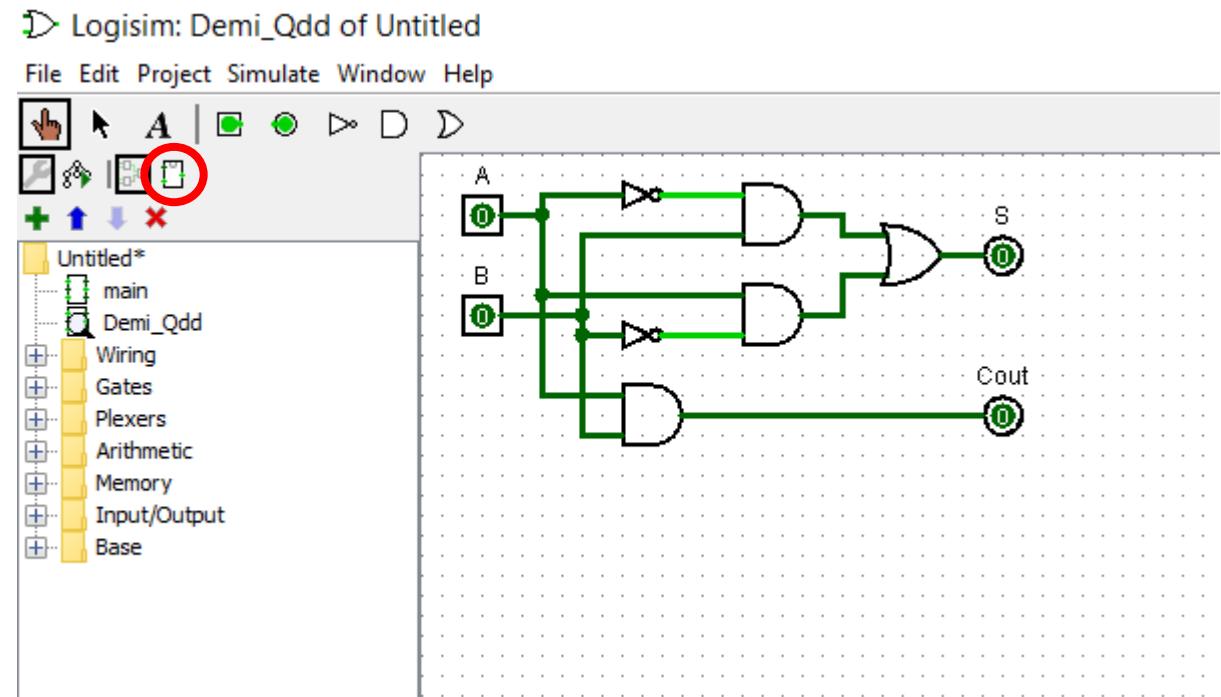
# 1. Demi-additionneur d'un bit



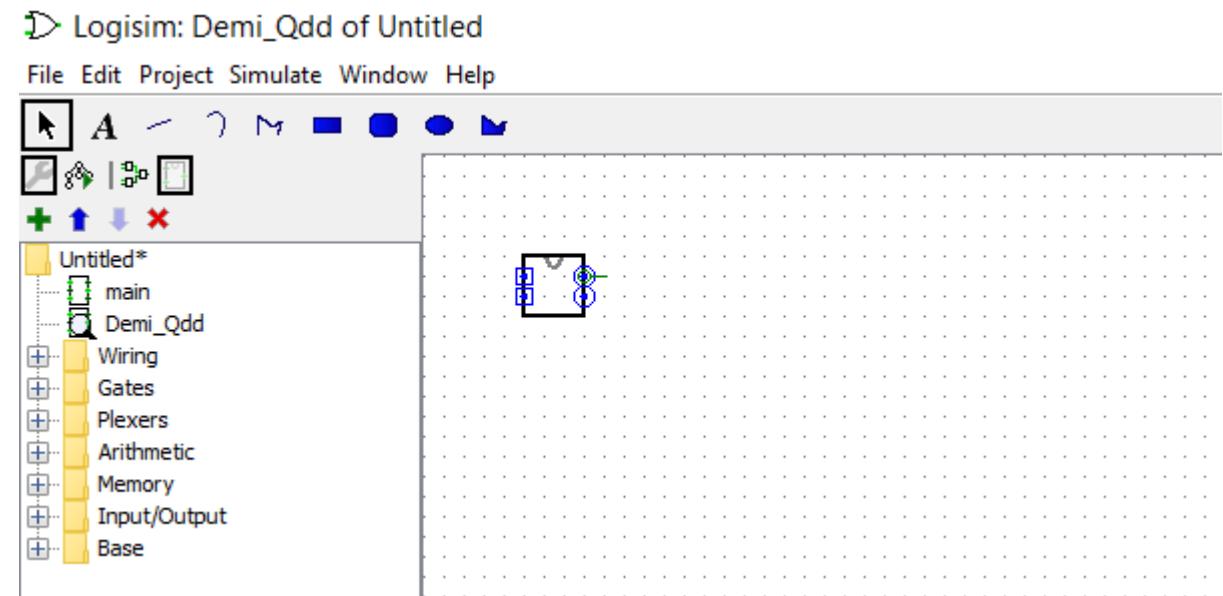
A	B	S	Cout
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1



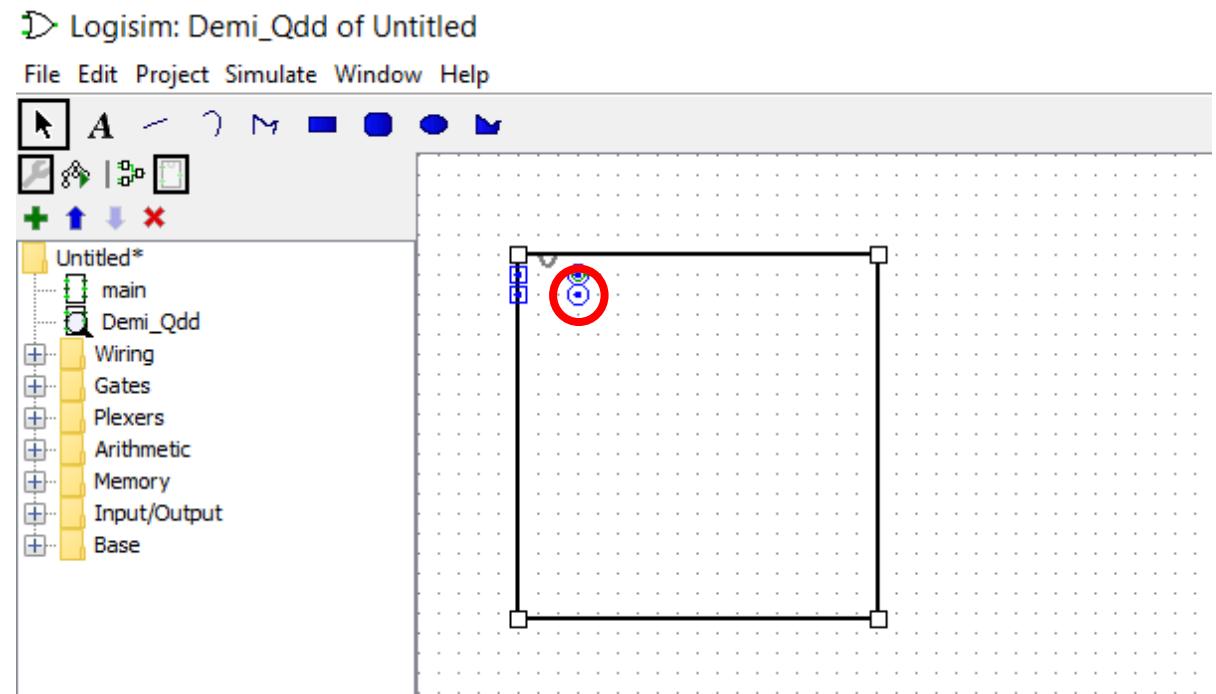
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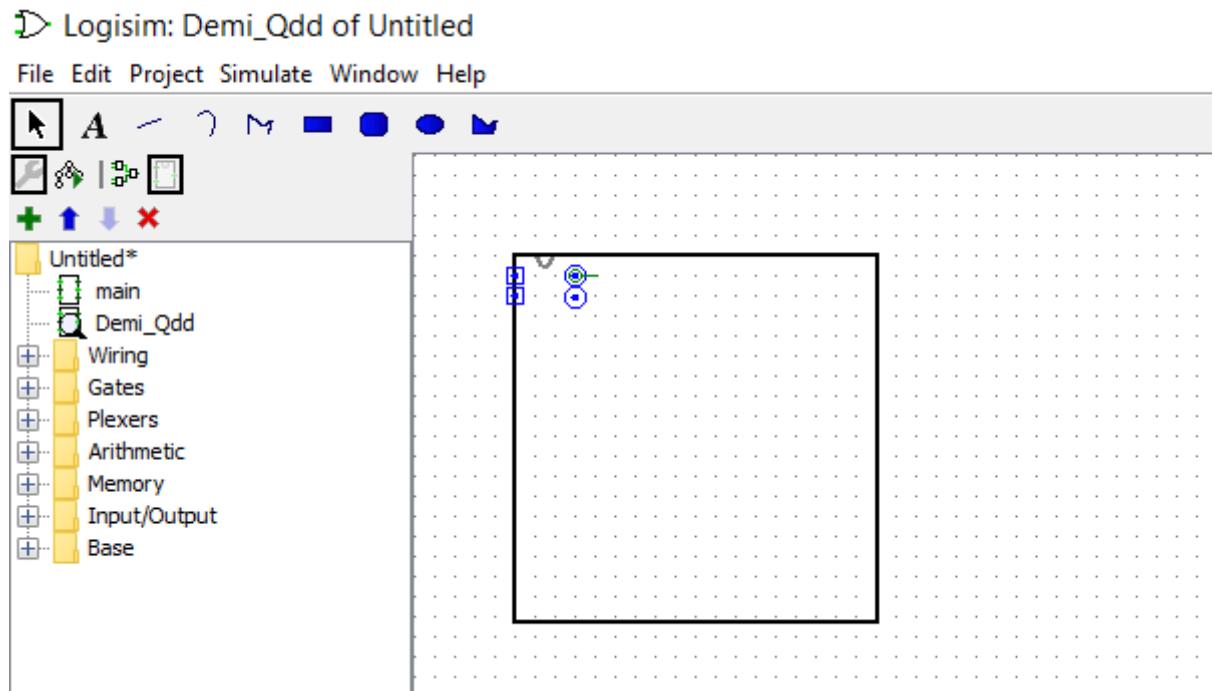
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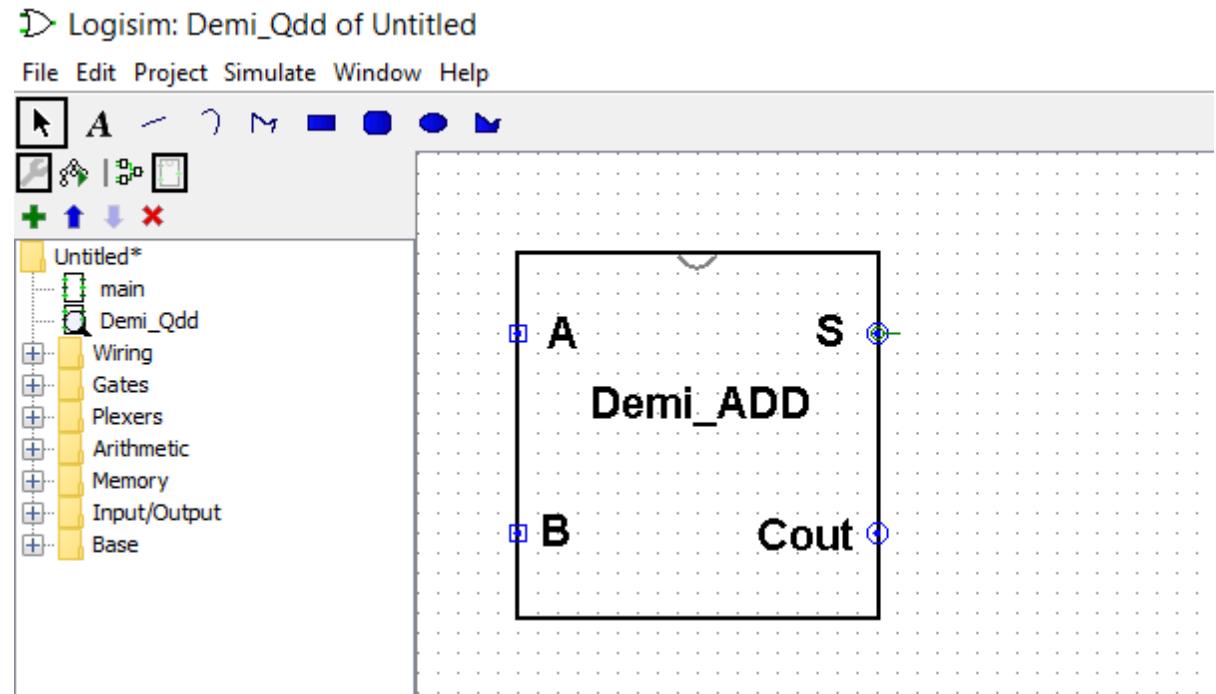
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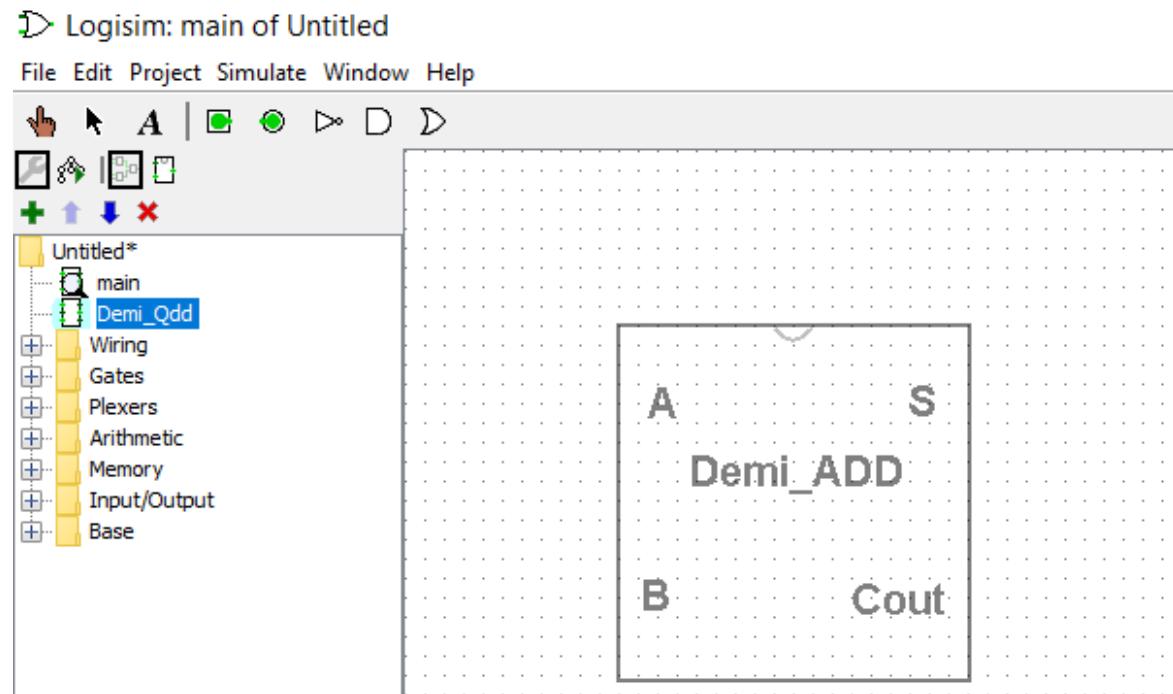
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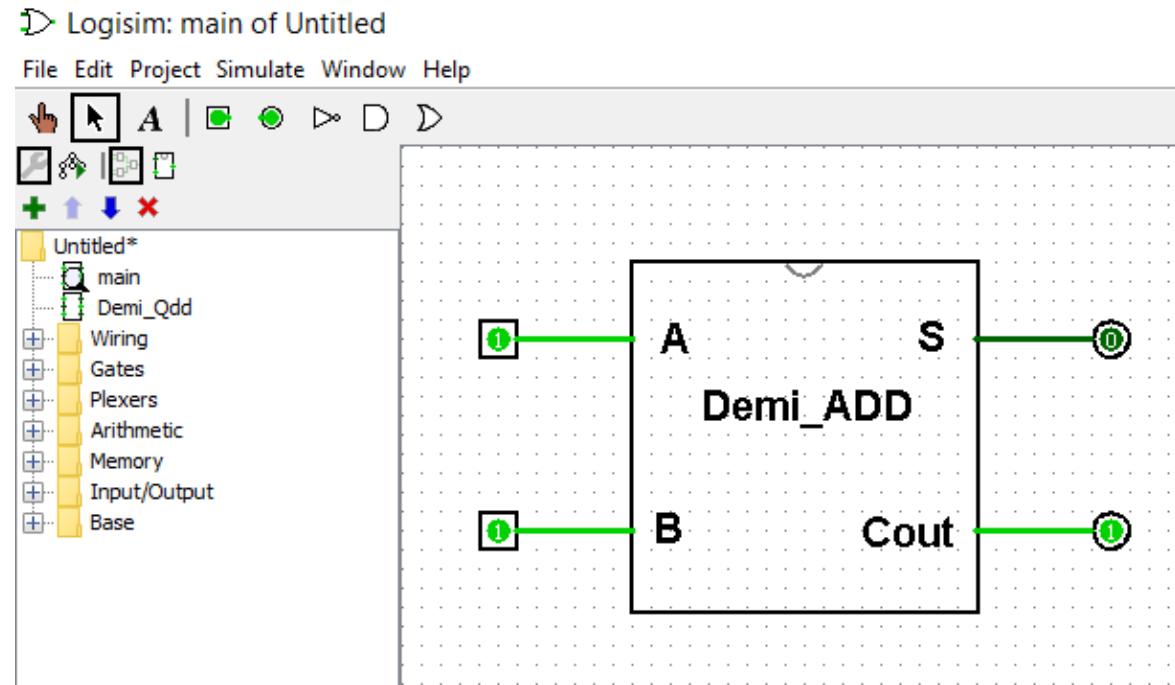
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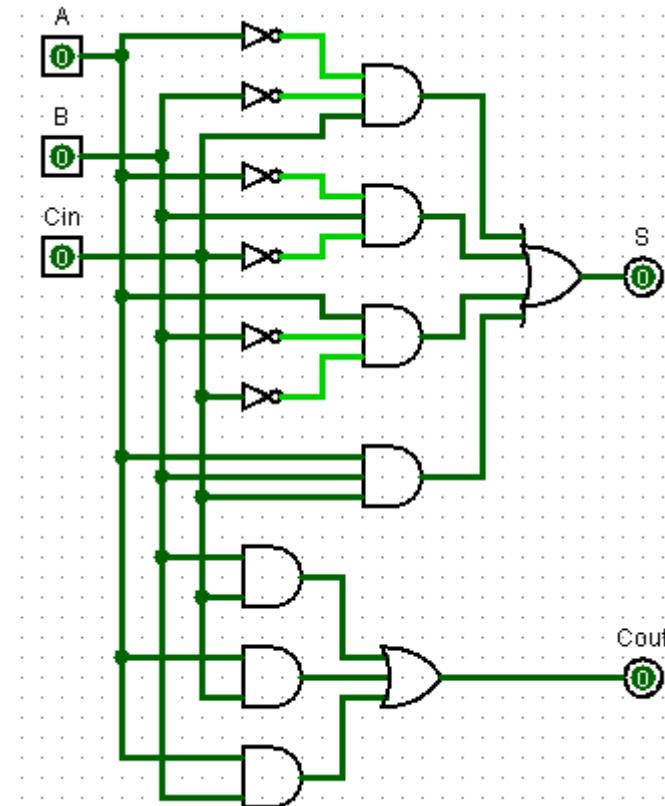
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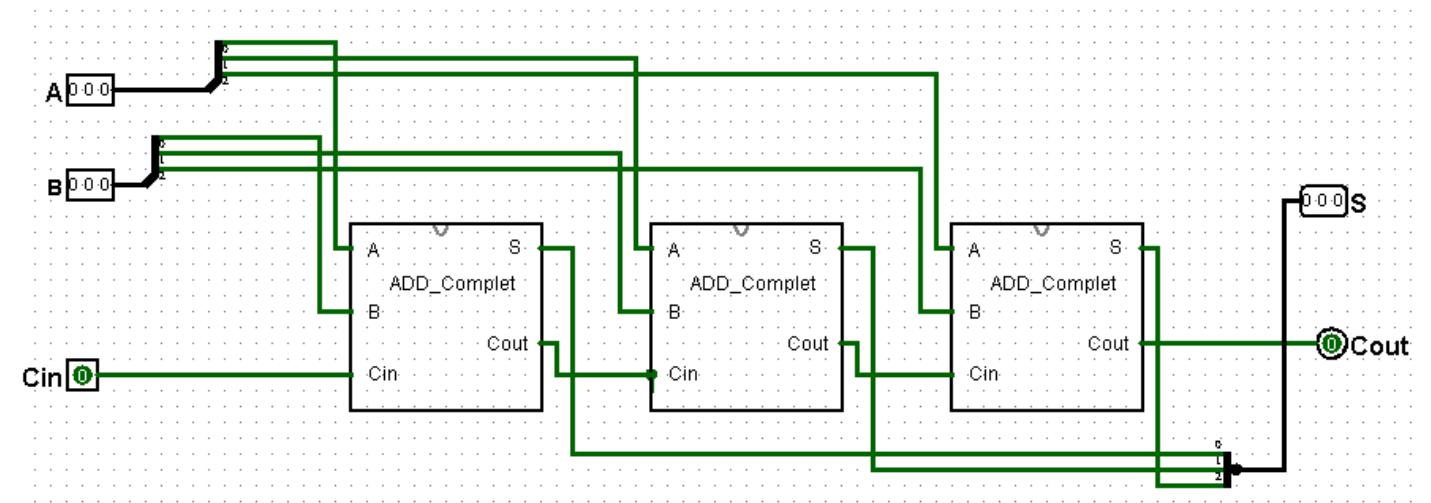
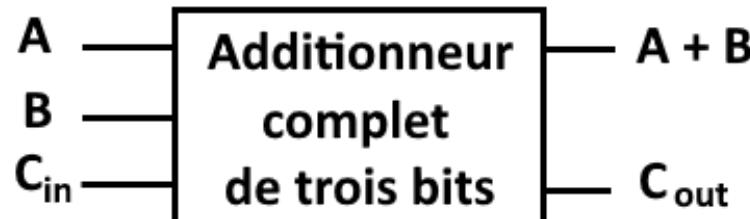
## 2. Additionneur complet d'un bit



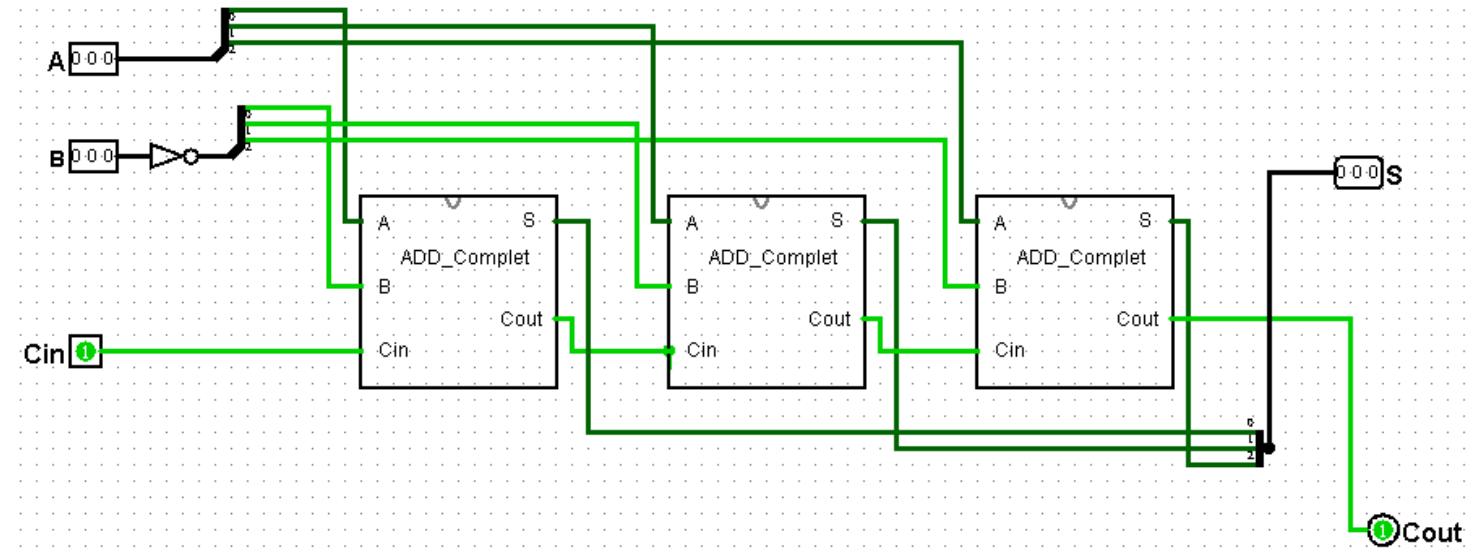
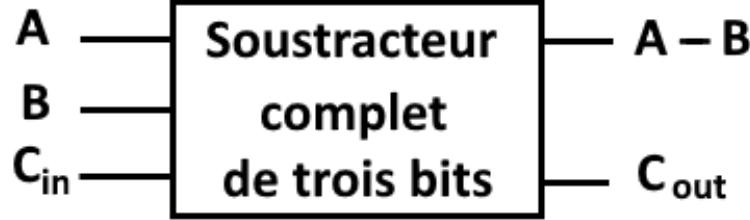
A	B	Cin	S	Cout
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1



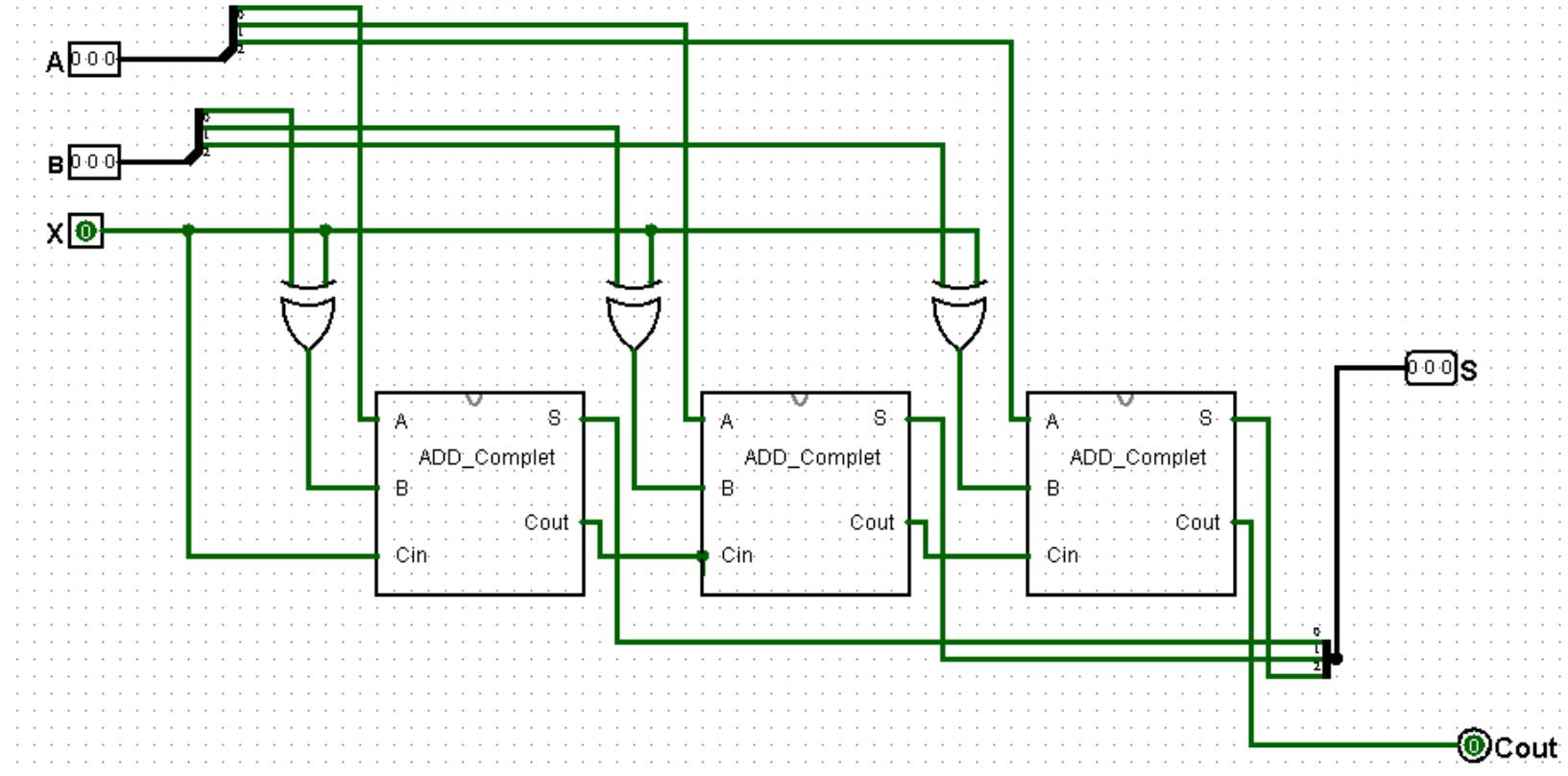
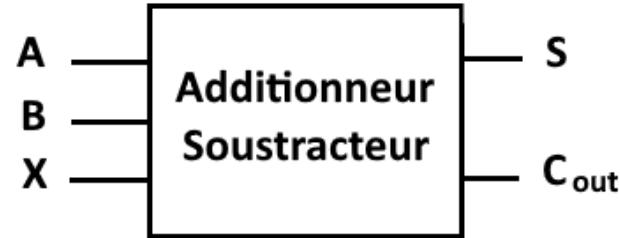
### 3. Additionneur complet de 3 bits



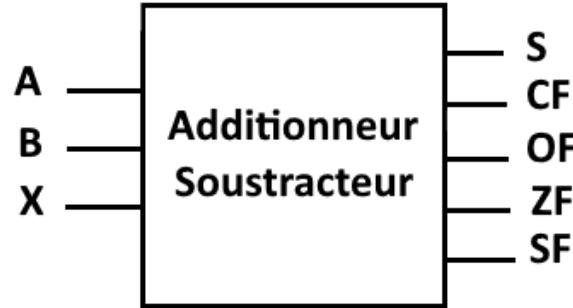
## 4. Soustracteur de 3 bits



## 5. Additionneur/Soustracteur 3 bits



## 6. Additionneur/Soustracteur 3 bits et flags d'états

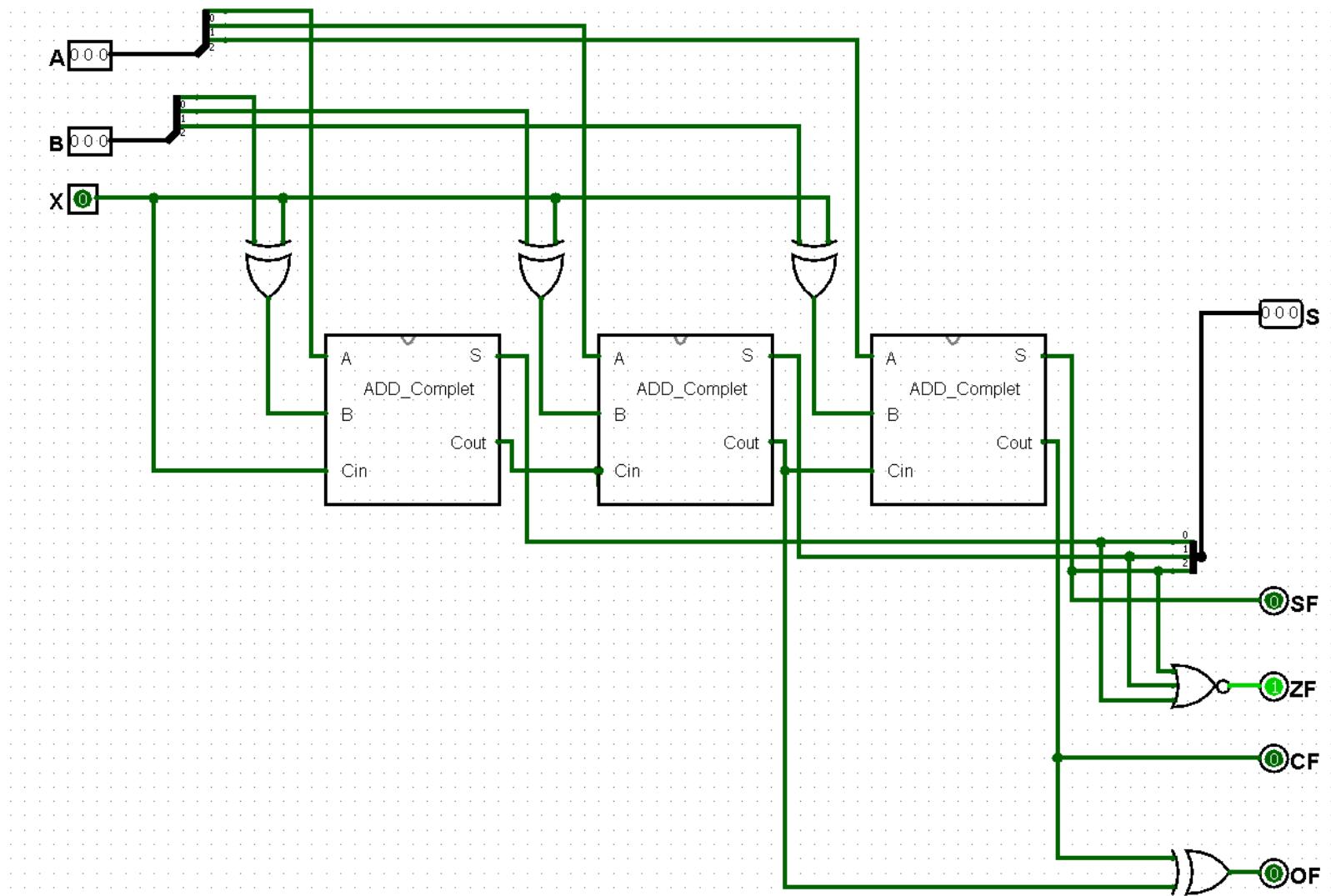


$$SF = S_{n-1}$$

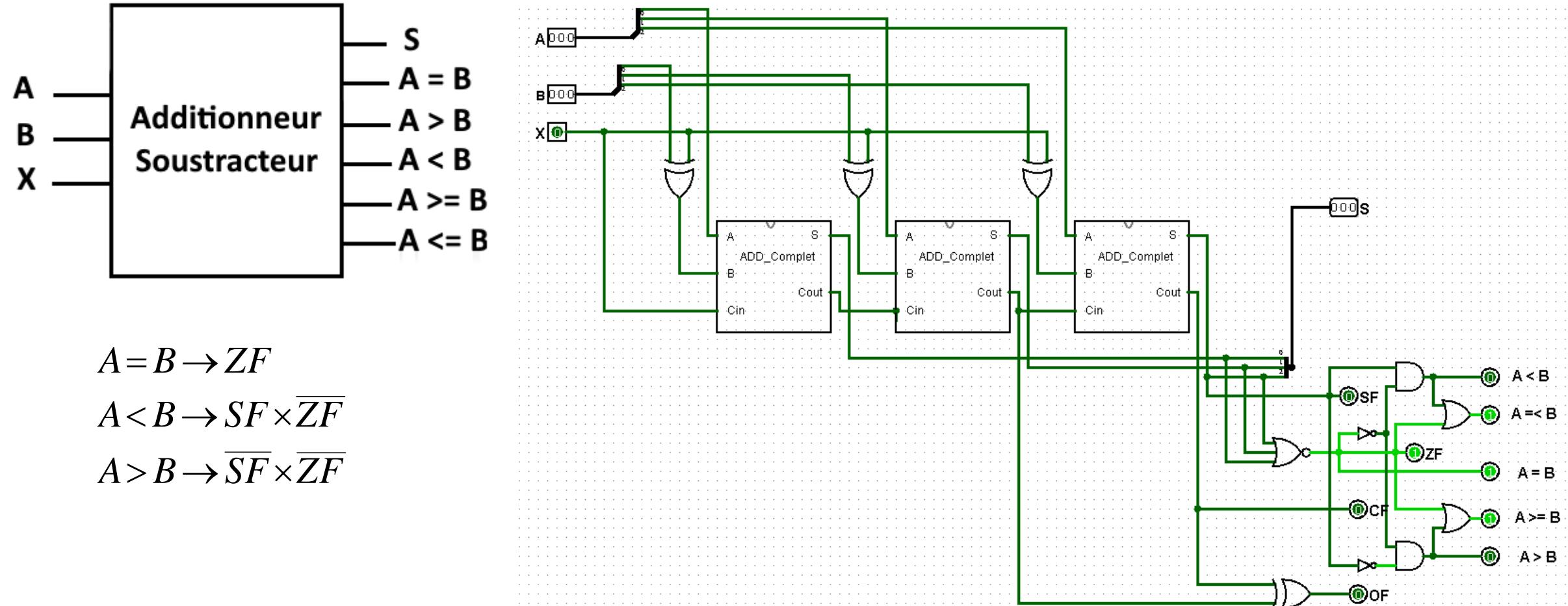
$$CF = Cout_{n-1}$$

$$OF = Cin_{n-1} \oplus Cout_{n-1}$$

$$ZF = \overline{S_0 + S_1 + S_2}$$



## 7. Additionneur/Soustracteur 3 bits et les opérations de comparaison



## 8. Multiplicateur de 2 bits

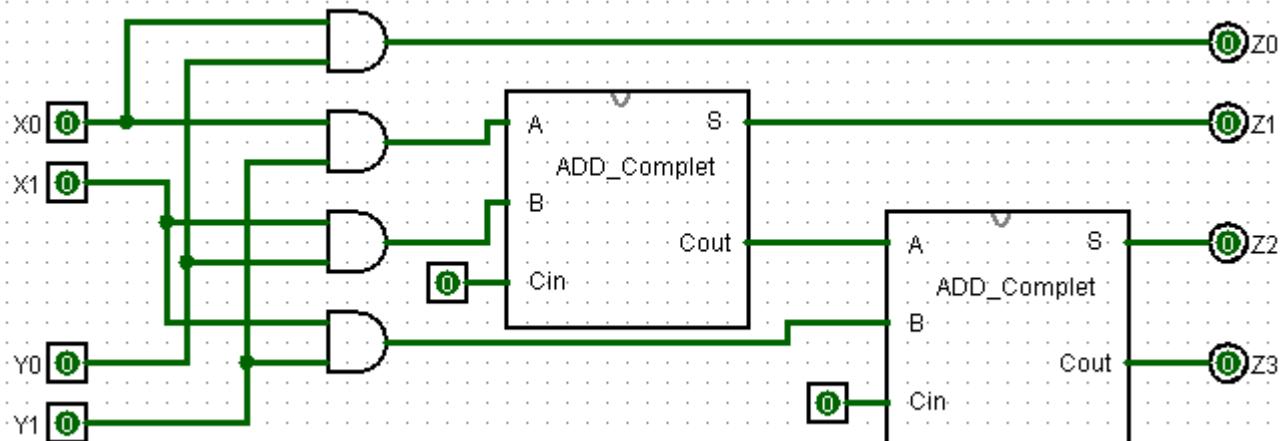
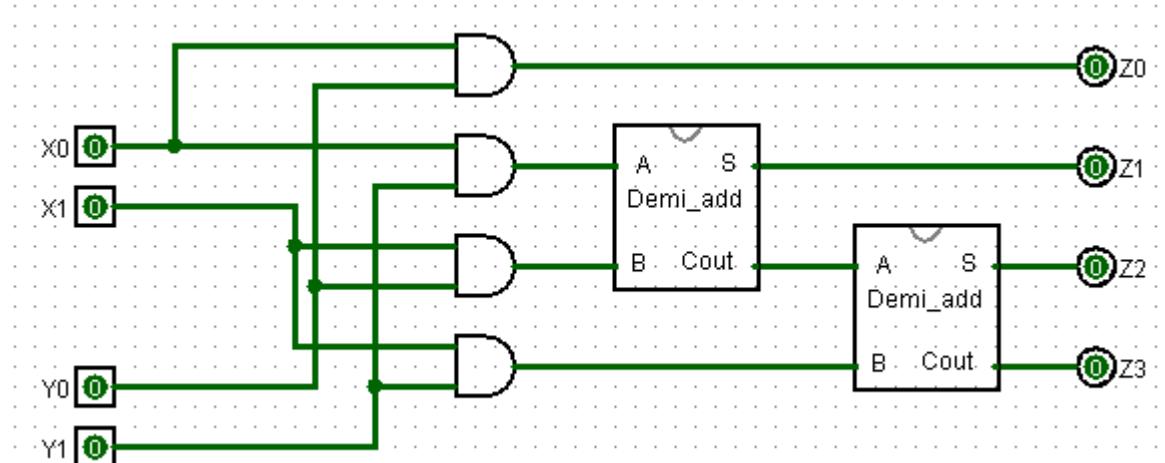


$$Z_0 = X_0 Y_0$$

$$Z_1 = X_0 Y_1 + X_1 Y_0 = A + B$$

$$Z_2 = X_1 Y_1 + Cout_1$$

$$Z_3 = Cout_2$$



A la séance prochaine