

FILIÈRE

: 1^{ère} année GL

ANNEE UNIVERSITAIRE : 2018/2019



RAPPORT DES TRAVAUX PRATIQUES D'ELECTRONIQUE NUMERIQUE

Prof : M.LAHLLOUH

TP n°01 : Fonction logiques

Exercice 1 :

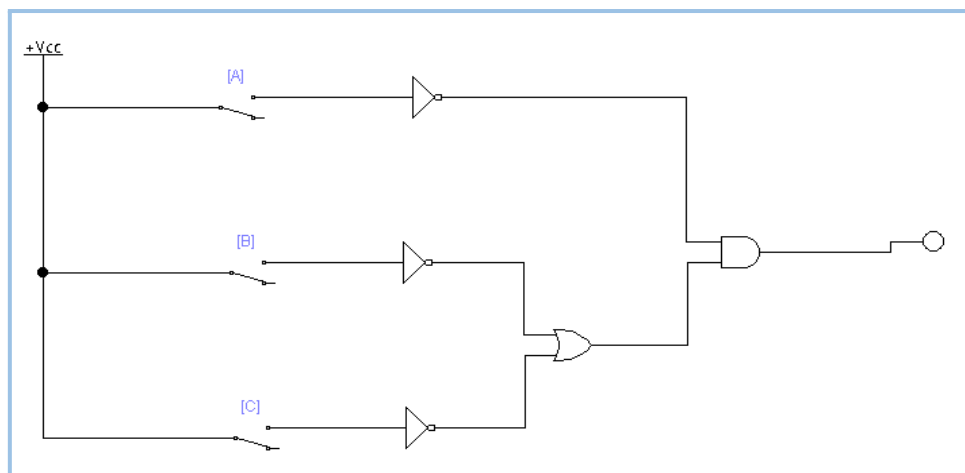
1) $X = \bar{a} \cdot (\bar{b} + \bar{c})$

$$Y = a \oplus b$$

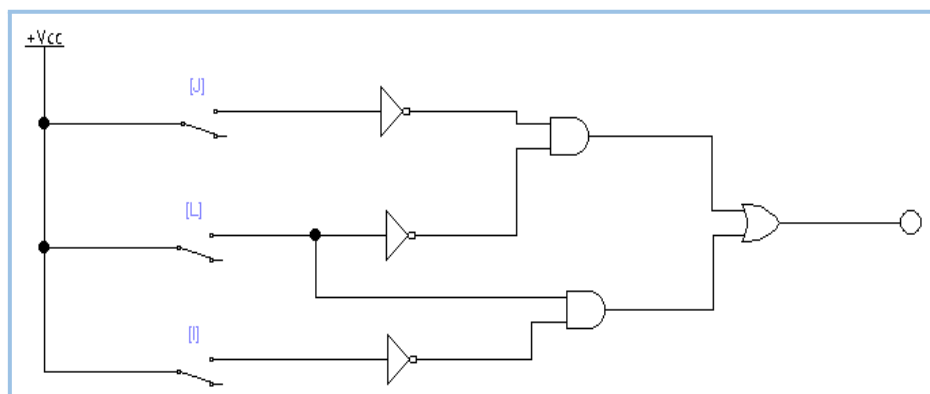
$$Z = 0$$

$$W = a\bar{b}c$$

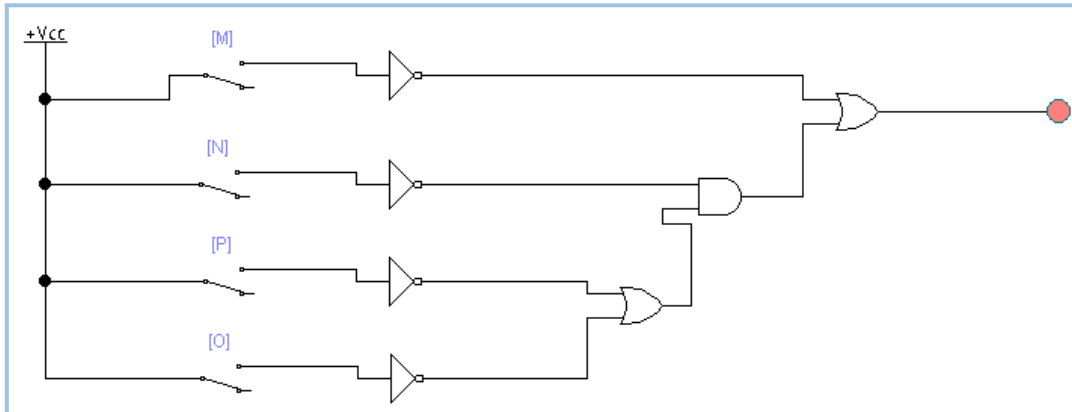
2) $F = \bar{a}(\bar{b} + \bar{c})$



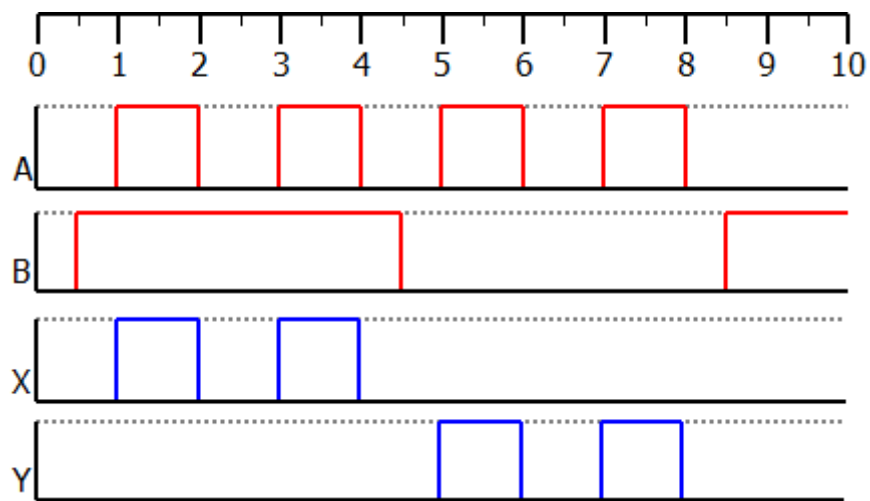
3) $T = \bar{J}\bar{L} + \bar{I}L$



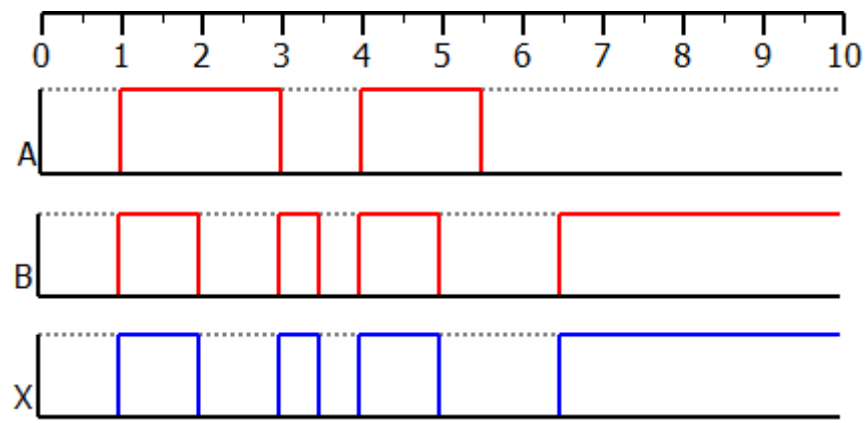
$$V = \overline{M} + \overline{N}(\overline{P} + \overline{O})$$



4) $X = AB$; $Y = A\overline{B}$:



$$X = \overline{(A \oplus B) \oplus \overline{A}} = B :$$



TP n°02 : Circuits combinatoires

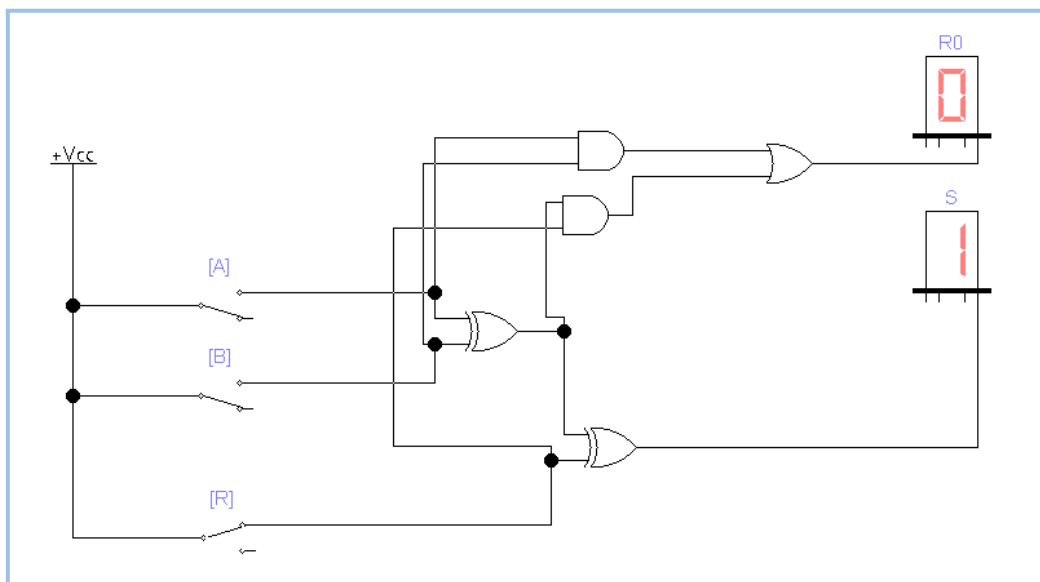
■ Etude d'un additionneur et comparateur :

Exercice 1 :

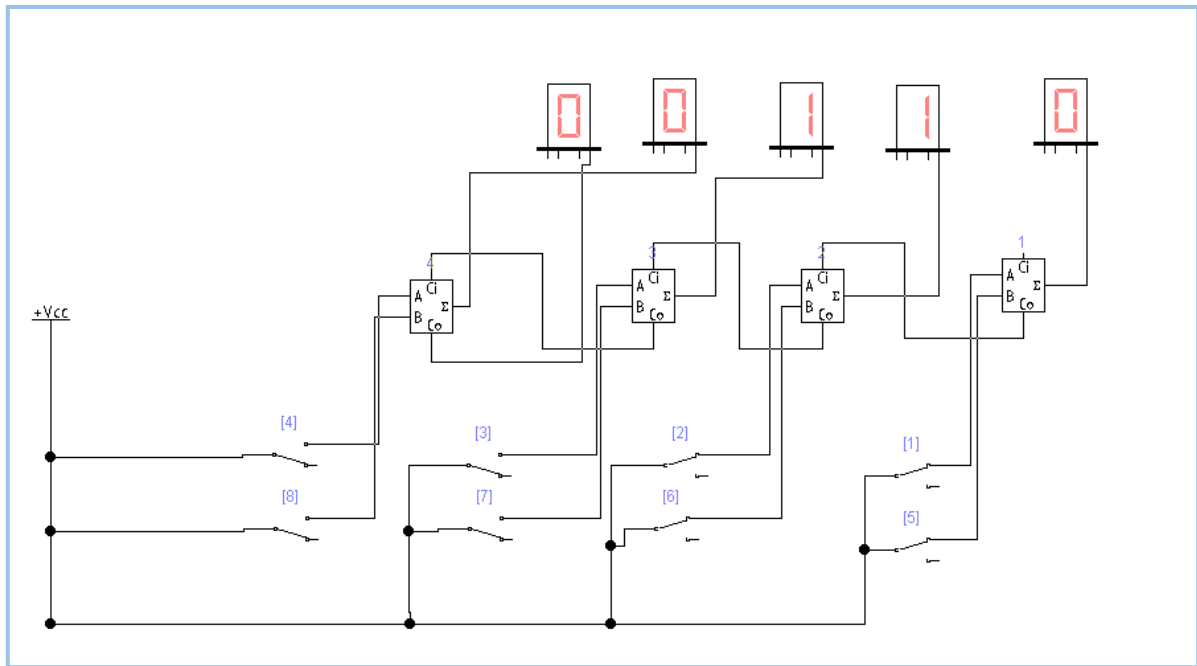
1) $S = A \oplus B \oplus R_i$; $R_0 = R_i (A \oplus B) + AB$

➡ S : présente la somme et R_0 : la retenue.

2)



3) L'additionneurs binaires parallèles de 4 bits :



Exercice 2 :

1) Le tableau de vérité et les fonctions :

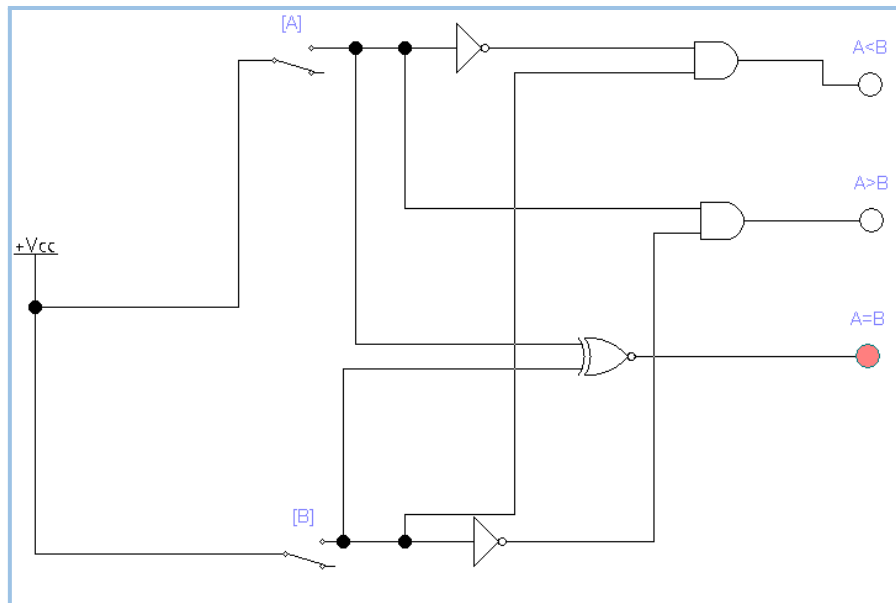
A	B	A<B	A>B	A=B
0	0	0	0	1
0	1	1	0	0
1	0	0	1	0
1	1	0	0	1

$$F \{A < B\} = \bar{A}B$$

$$F \{A > B\} = A\bar{B}$$

$$F \{A = B\} = \bar{A}\bar{B} + AB = \overline{A \oplus B}$$

- Simulation :



▪ Etude d'un multiplexeur/démultiplexeur :

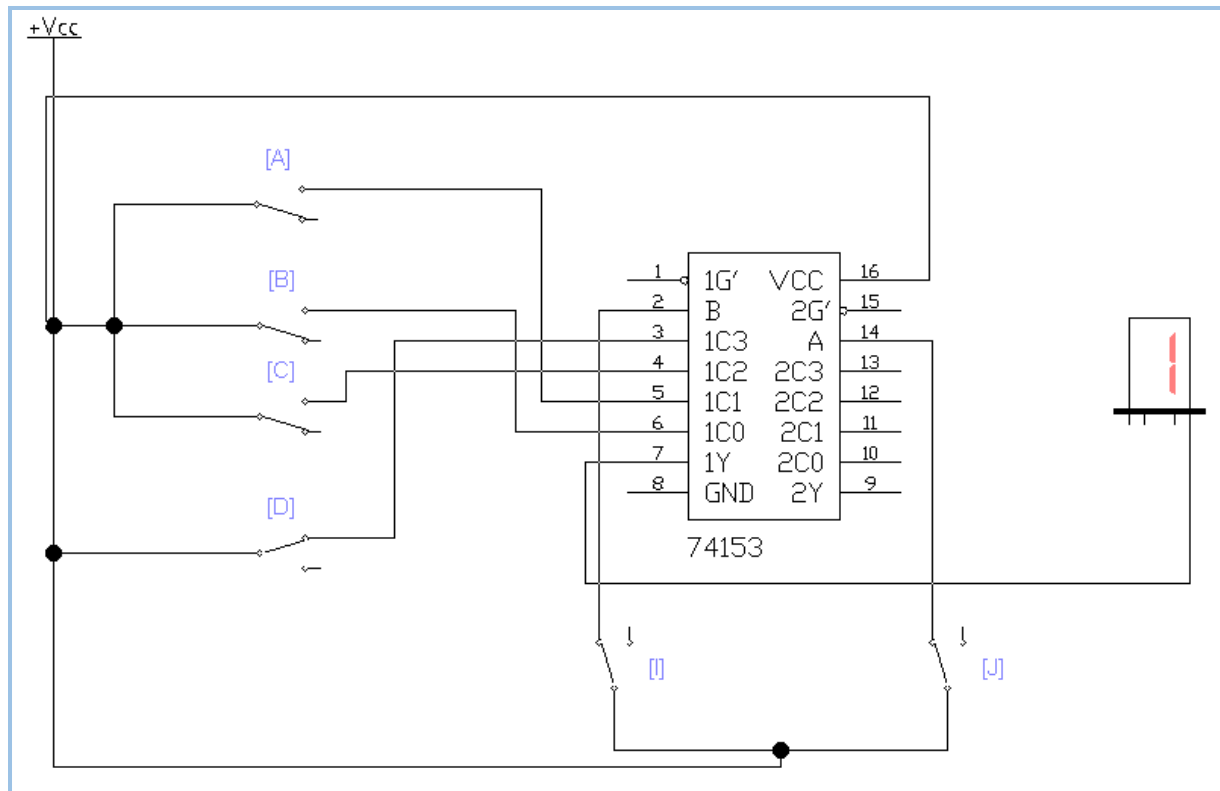
Exercice 1 :

1) La table de vérité :

I	J	X
0	0	B
0	1	A
1	0	C
1	1	D

{ Le fonctionnement de ce circuit est le même de multiplexeur.

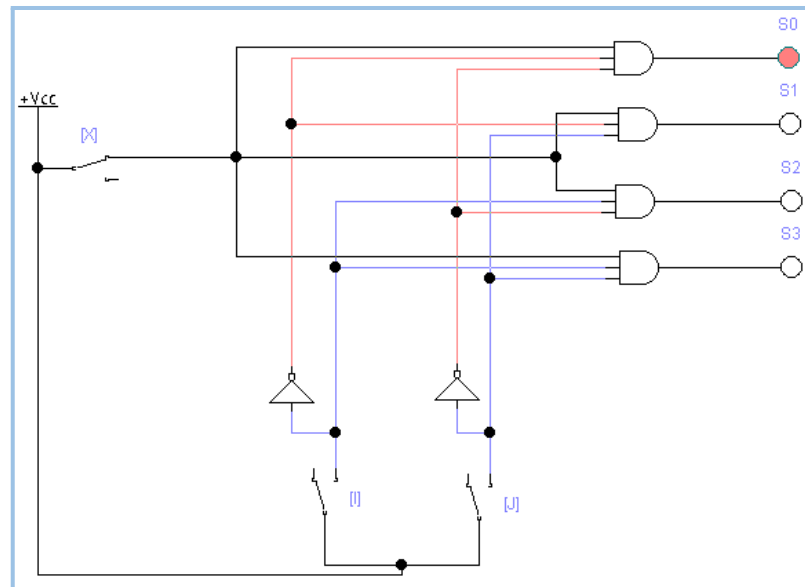
2)



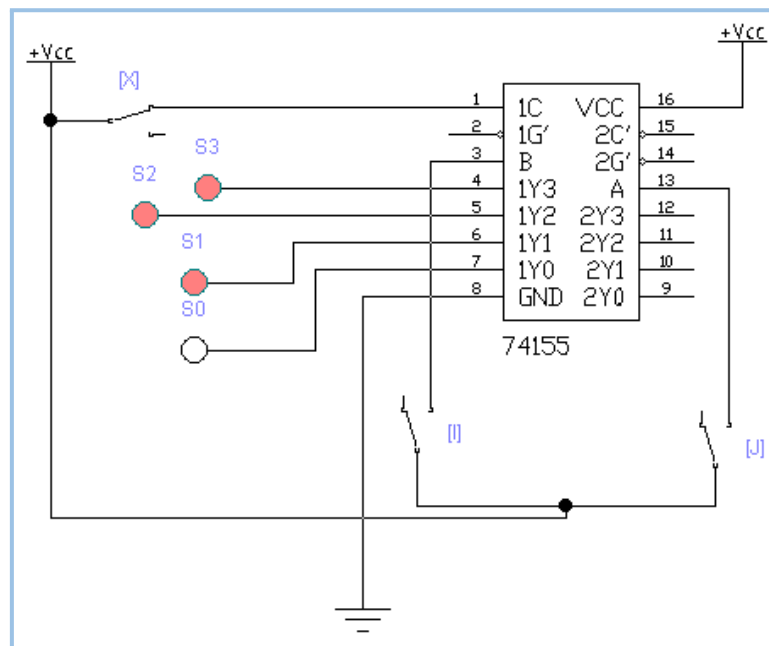
Exercise 2 :

1)

x	I	J	S3	S2	S1	S0
X	0	0	0	0	0	X
X	0	1	0	0	X	0
X	1	0	0	X	0	0
X	1	1	X	0	0	0



2)



■ Etude d'un Décodeur/Codeur :

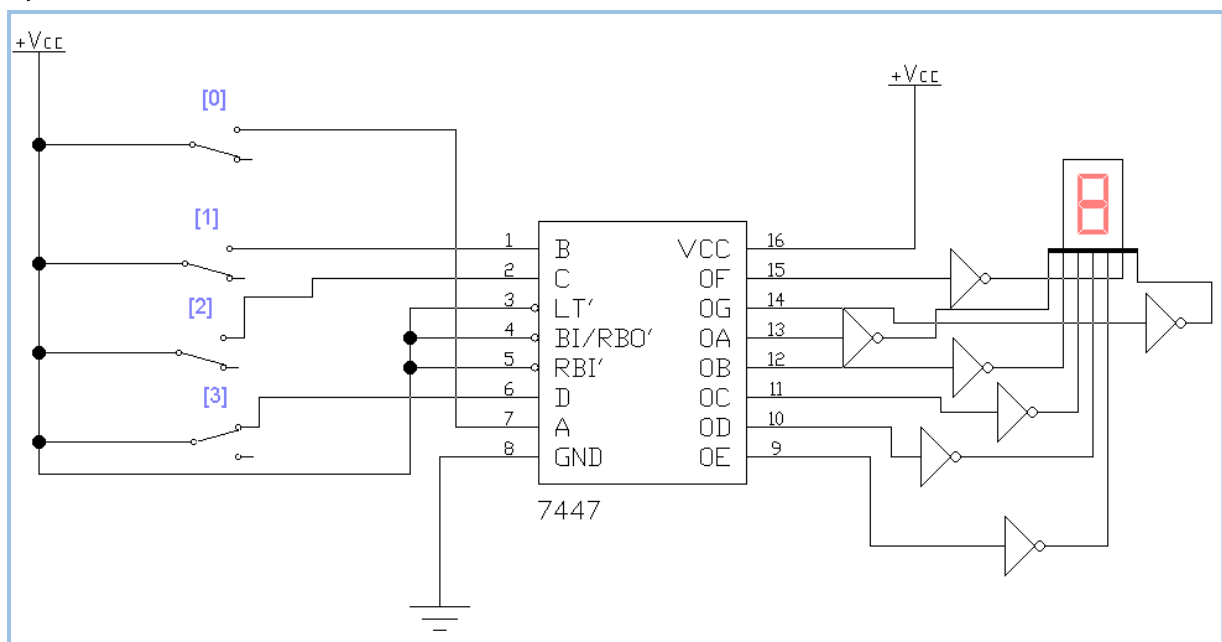
Exercice 1 :

1)

E3	E2	E1	E0	F	E	G	D	C	B	A
0	0	0	0	1	1	0	1	1	1	1
0	0	0	1	0	0	0	0	1	1	0
0	0	1	0	1	0	1	1	0	1	1
0	0	1	1	0	0	1	1	1	1	1
0	1	0	0	1	0	1	0	1	1	0
0	1	0	1	1	0	1	1	1	0	1
0	1	1	0	1	1	1	1	1	0	0
0	1	1	1	0	0	0	0	1	1	1
1	0	0	0	1	1	1	1	1	1	1
1	0	0	1	1	0	1	1	1	1	1

2) C'est un décodeur DCB/7 segment.

3)

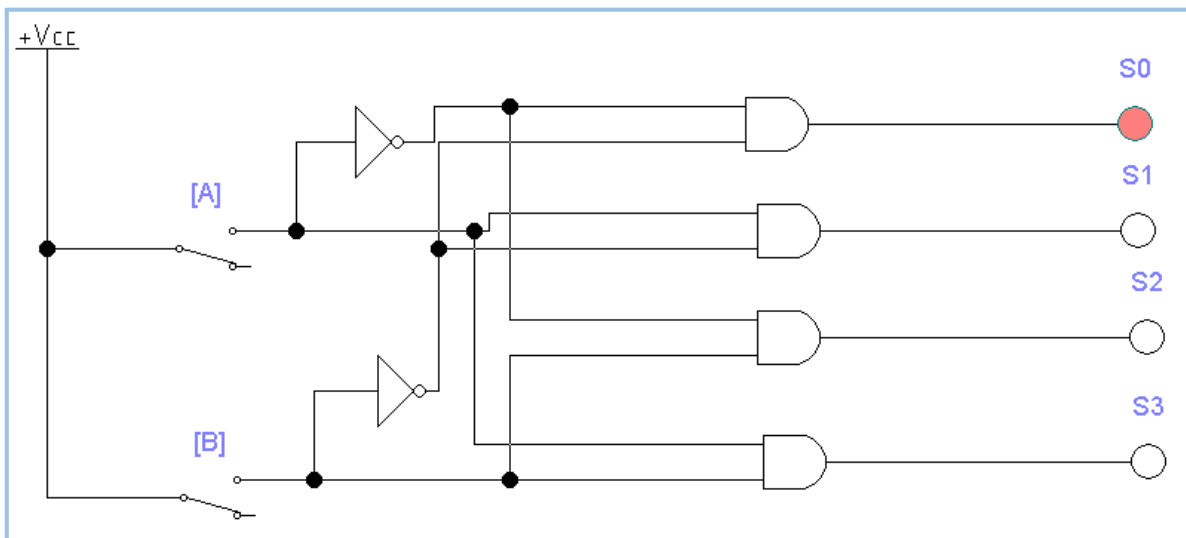


Exercice 2 :

1)

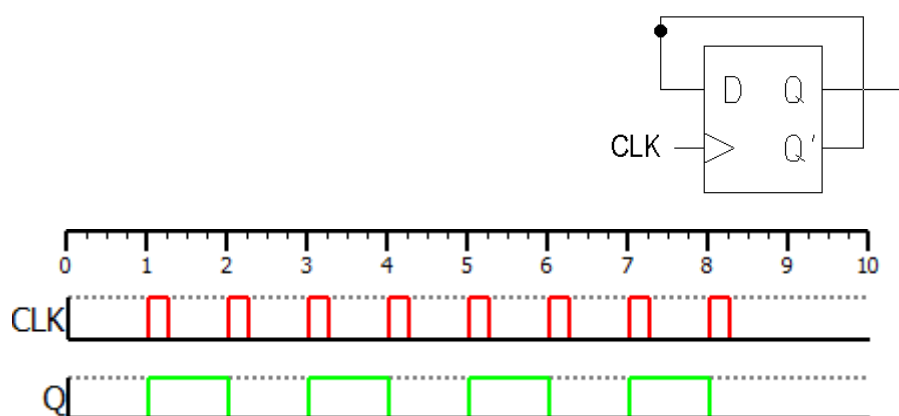
B	A	S3	S2	S1	S0
0	0	0	0	0	1
0	1	0	0	1	0
1	0	0	1	0	0
1	1	1	0	0	0

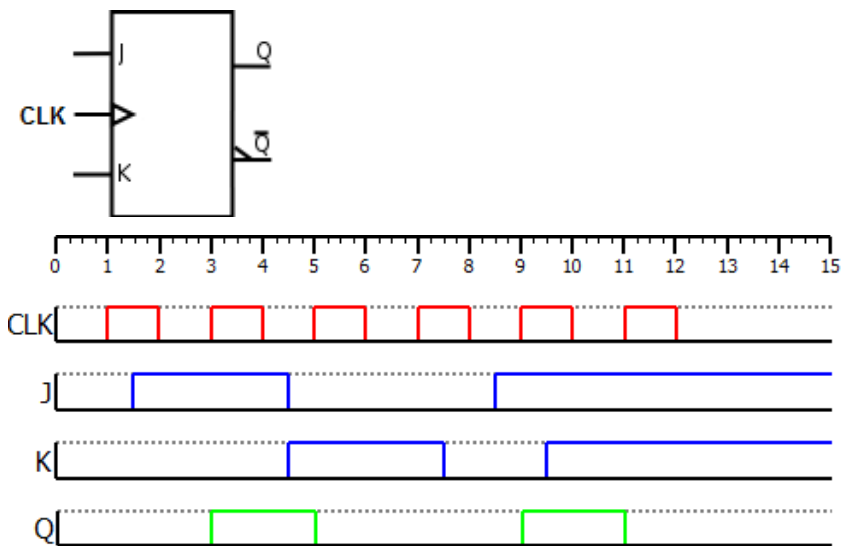
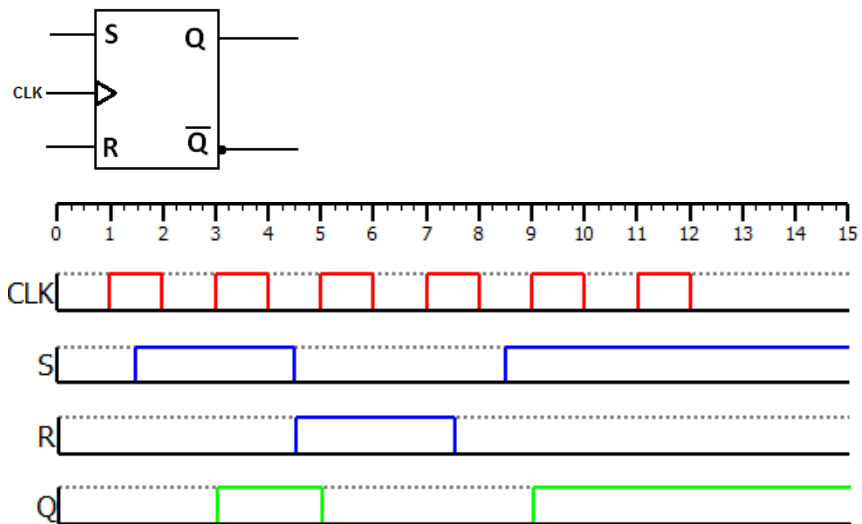
2)

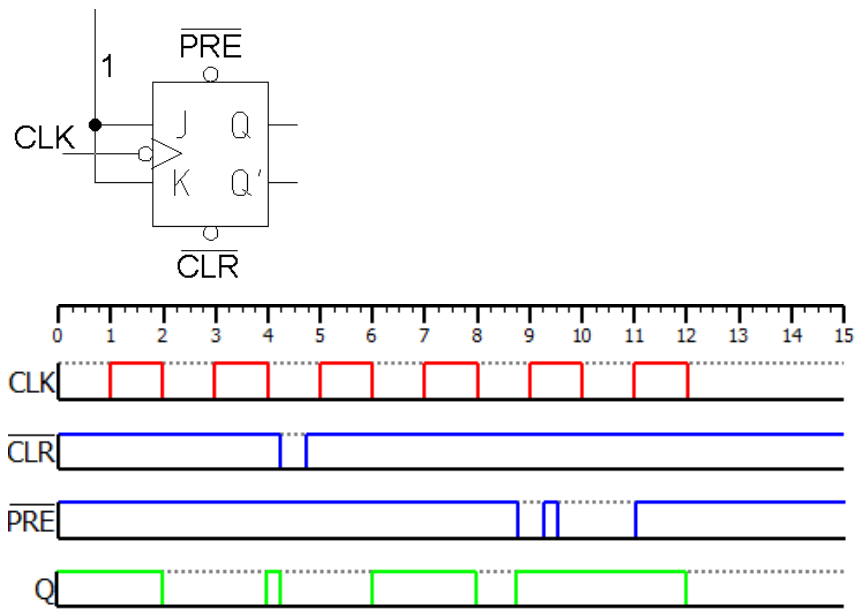


TP n°03 : Etude des bascules et compteurs

Exercice 1 :







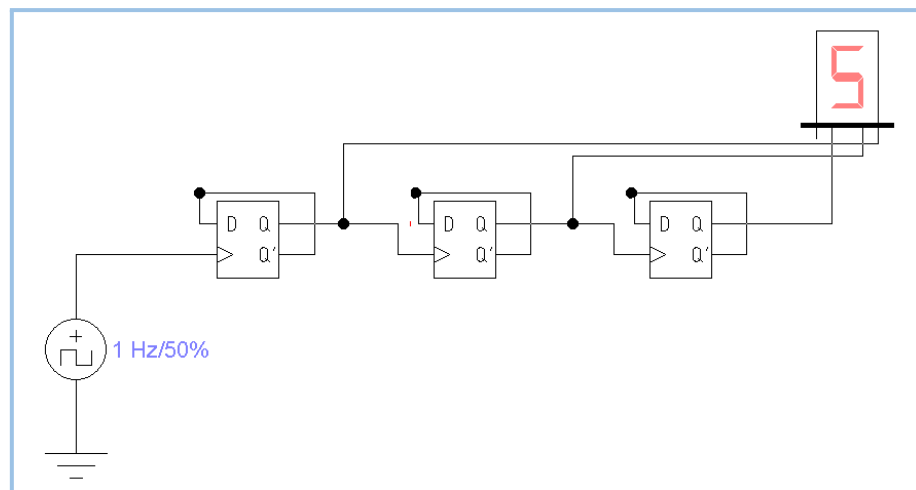
Exercice 2 :

1) C'est un circuit asynchrone.

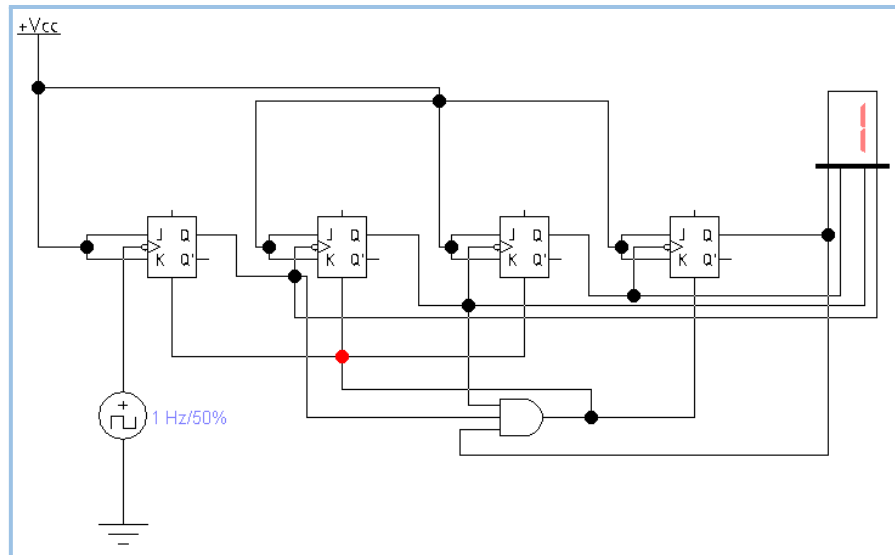
2)



3)



4)



5) Avec la méthode de Marcus on obtient :

$$\begin{cases} J_0 = 1 \\ K_0 = 1 \end{cases} \quad \begin{cases} J_1 = Q_0 \bar{Q}_3 \\ K_1 = Q_0 \end{cases} \quad \begin{cases} J_2 = Q_0 Q_2 \\ K_2 = Q_0 \end{cases}$$

Simulation :

