

Lucrare nr. 4

a) Verificati teorema conform careia:

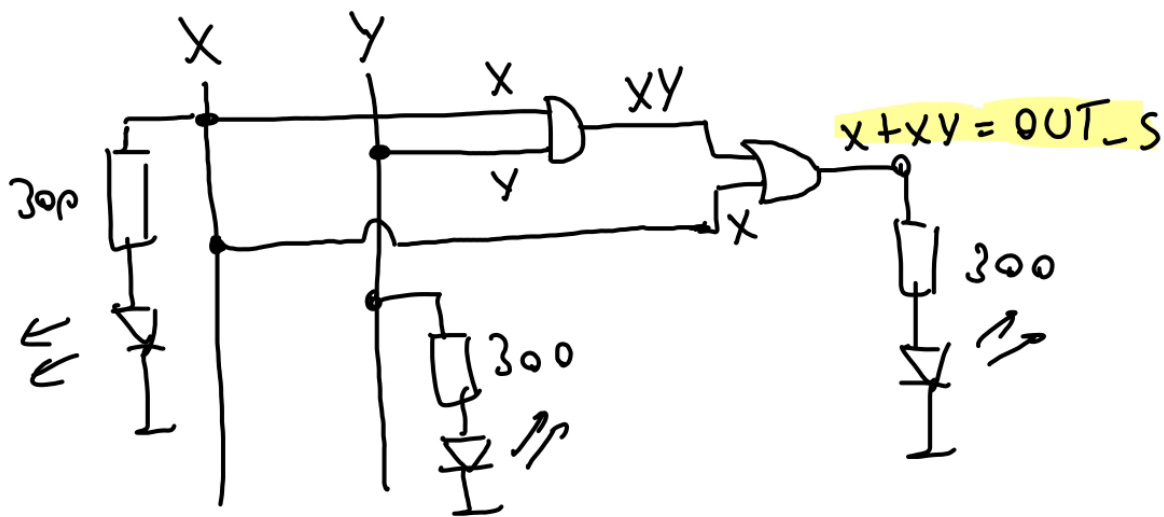
experimental

$$\underbrace{X + X \cdot Y}_{\text{OUT-S}} = \underbrace{X}_{\text{OUT-D}}$$

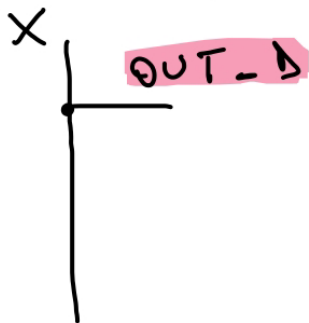
Teorema e validă dacă  
 $\text{OUT-S} = \text{OUT-D}$  (experimental)

Pașul 1: schema cu porți:

Schema stânga:



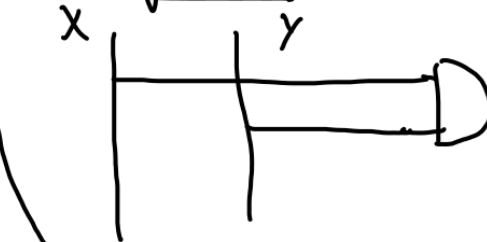
Schema dreapta:



+ firele nu sunt legate între ele

+ firele sunt legate între ele

ex. grenit:



Partea 2: Tabelul de adevăr:

X	Y	OUT_S	OUT_Δ
0	0	0	0
0	1	0	0
1	0	1	1
1	1	1	1

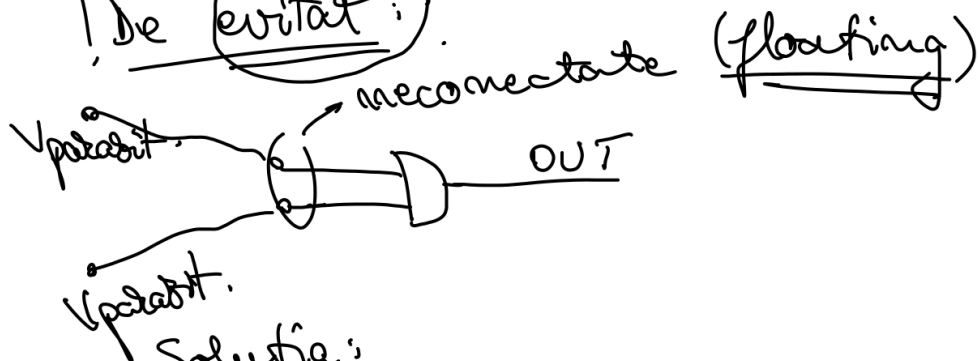
⇒

$$\text{OUT}_S = \text{OUT}_\Delta$$

∴

Teorema este  
validă

! De evitat:

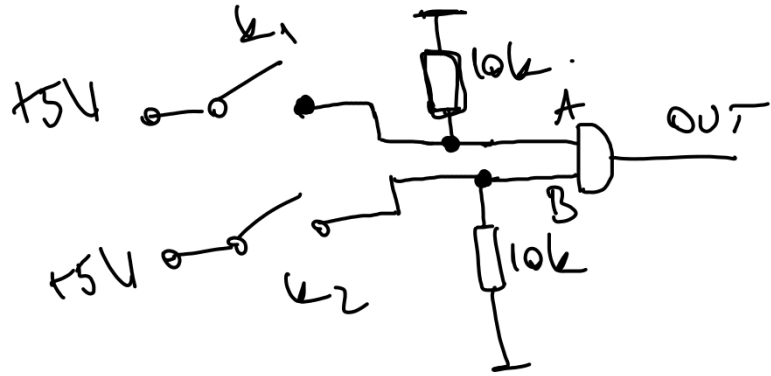


Soluția:

Vrem ca atunci când nu avem 1 logic aplicat pe intrări,  
acestea să fie legate la 0 logic (sau invers).

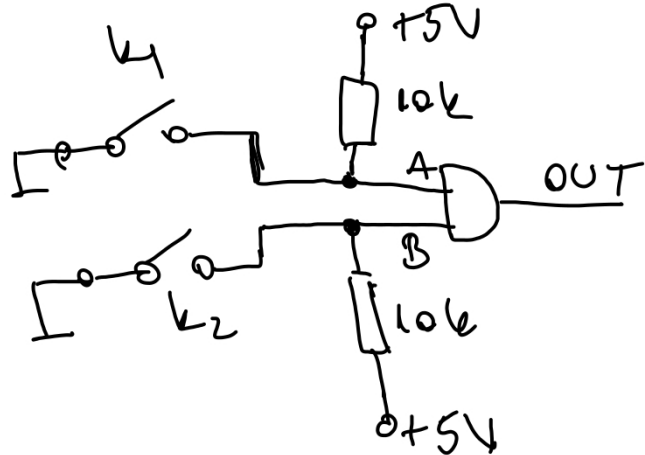
Rezistori de pull-down / pull-up  
(0 logic)      (1 logic)

## Rezistori de pull-down:



Ex:  $k_1$  deschis  $\Rightarrow A = 0$  logic  
 $k_1$  închis  $\Rightarrow A = 5V = 1$  logic

## Complementar, rezistori de pull-up:

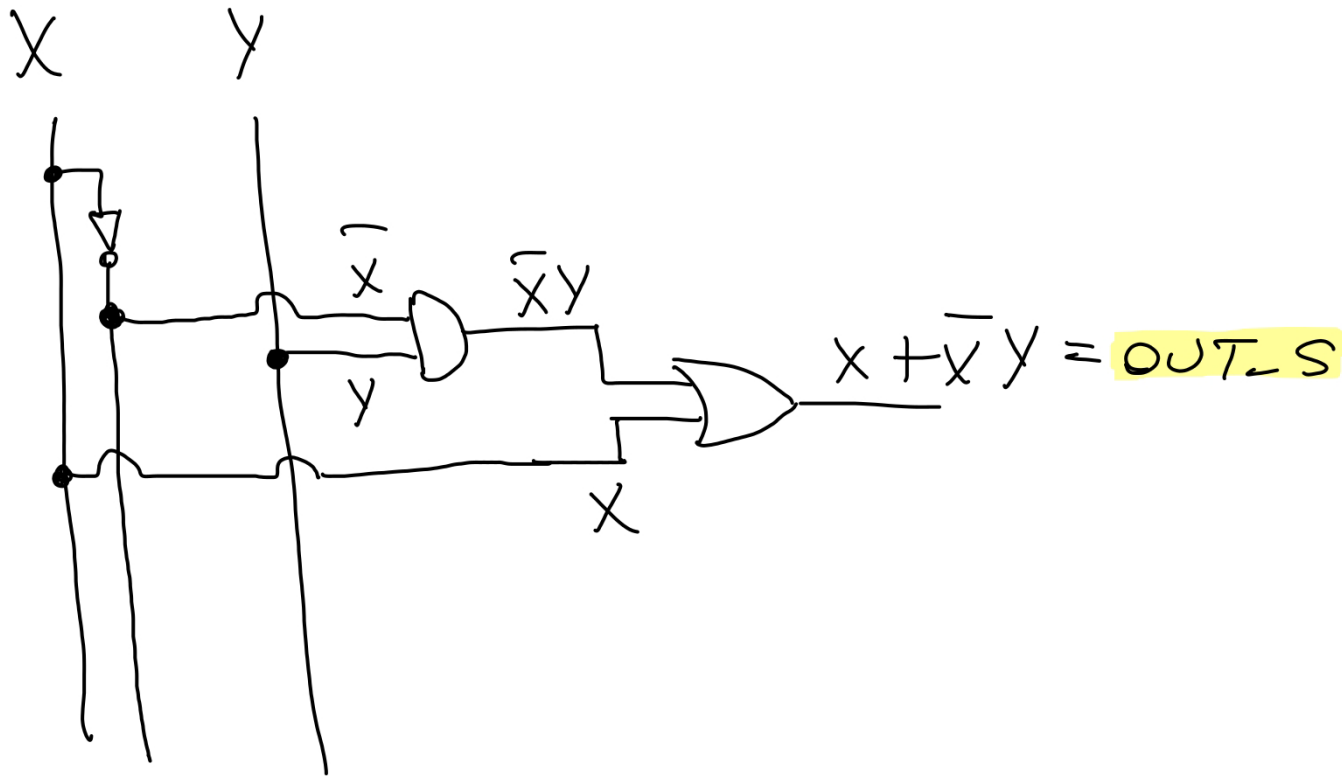


$k_1$  deschis  $\Rightarrow A = 5V = 1$  logic  
 $k_1$  închis  $\Rightarrow A = 0V = 0$  logic

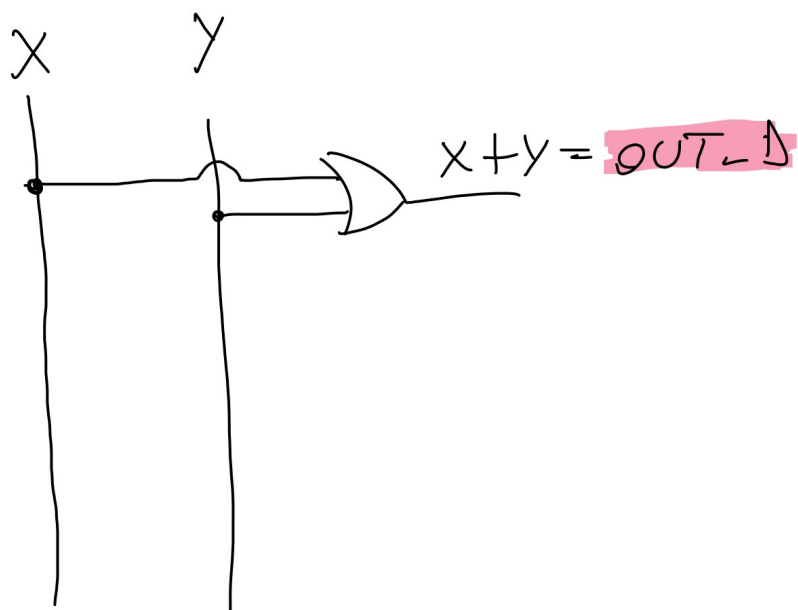
(b) Verificați teorema conform  
cărui  $X + \bar{X}Y = X + Y$ .

Partea 1: schemele cu porți logice

Schema stânga:



# Schema dreapta:



## Partea 2: Tabelul de adevăr

X	Y	OUT_5	OUT_1
0	0	0	0
0	1	1	1
1	0	1	1
1	1	1	1

$\Rightarrow$   $OUT_5 = OUT_1$   
Teorema este validă

