

Seminar 4 electronica I

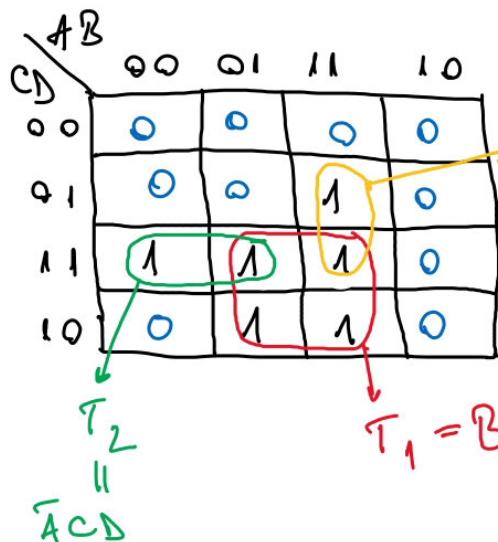
Diagrame Karnaugh cu 4 variabile:

ex. 1 Minimizați funcția:

$$F = \underbrace{ABCD}_{1111} + \underbrace{A\bar{B}CD}_{1101} + \underbrace{ABC\bar{D}}_{1110} + \underbrace{\bar{A}BCD}_{0111} + \underbrace{\bar{A}\bar{B}CD}_{0011} + \underbrace{\bar{A}BC\bar{D}}_{0110}$$

$$1111 = 1 \cdot 2^3 + 1 \cdot 2^2 + 1 \cdot 2^1 + 1 \cdot 2^0 = 4 + 2 + 1 = 7$$

A	B	C	D	F
0	0	0	0	0
1	0	0	1	0
2	0	1	0	0
3	0	1	1	1
4	0	1	0	0
5	0	1	1	0
6	0	1	0	1
7	0	1	1	1
8	1	0	0	0
9	1	0	1	0
A=10	1	0	1	0
B=11	1	0	1	0
C=12	1	1	0	0
D=13	1	1	0	1
E=14	1	1	1	1
F=15	1	1	1	1

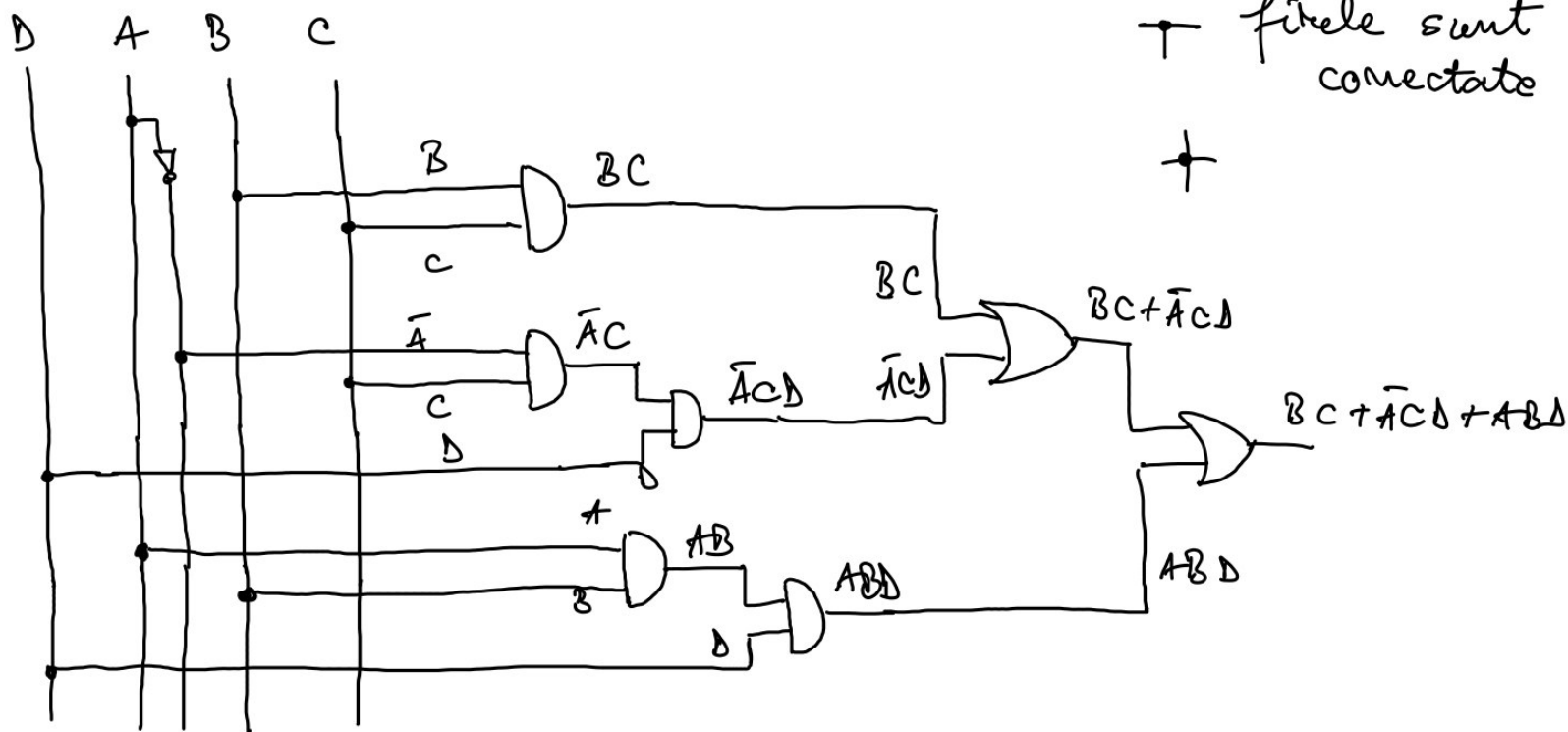


$T_3 = ABD$
 $F \rightarrow SOP$

$$F = T_1 + T_2 + T_3 = BC + \bar{A}CD + ABD$$

Circuitul F cu porți NAND:

pasul 1 -> circuitul cu porți NU, ȘI, SAU

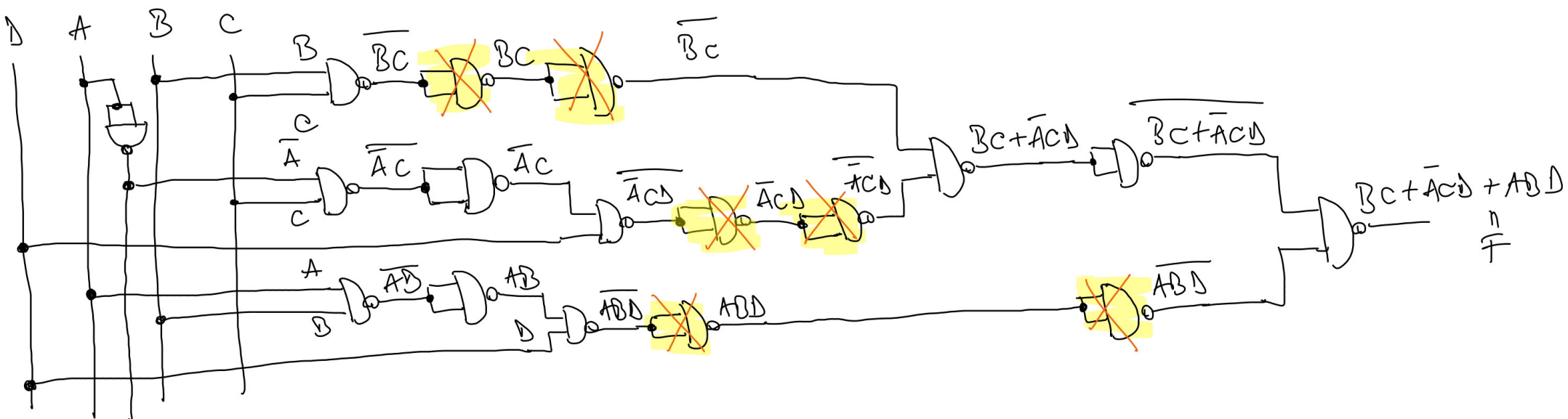


⊥ fizele nu sunt conectate

⊥ fizele sunt conectate

⊥

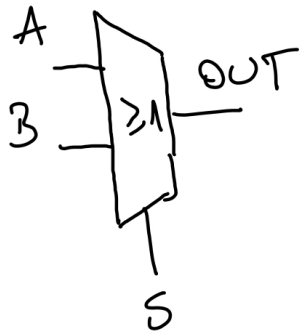
Pașul 2: circuitul cu porți și-XU



Multiplexarea:

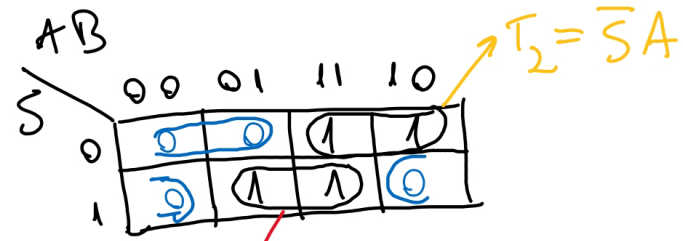
- selector de date
- n intrări
- 1 ieșire
- $\log_2 n$ intrări de selecție.

Multiplexor 2:1



$S = 0 \Rightarrow \text{OUT} = A$
 $S = 1 \Rightarrow \text{OUT} = B$

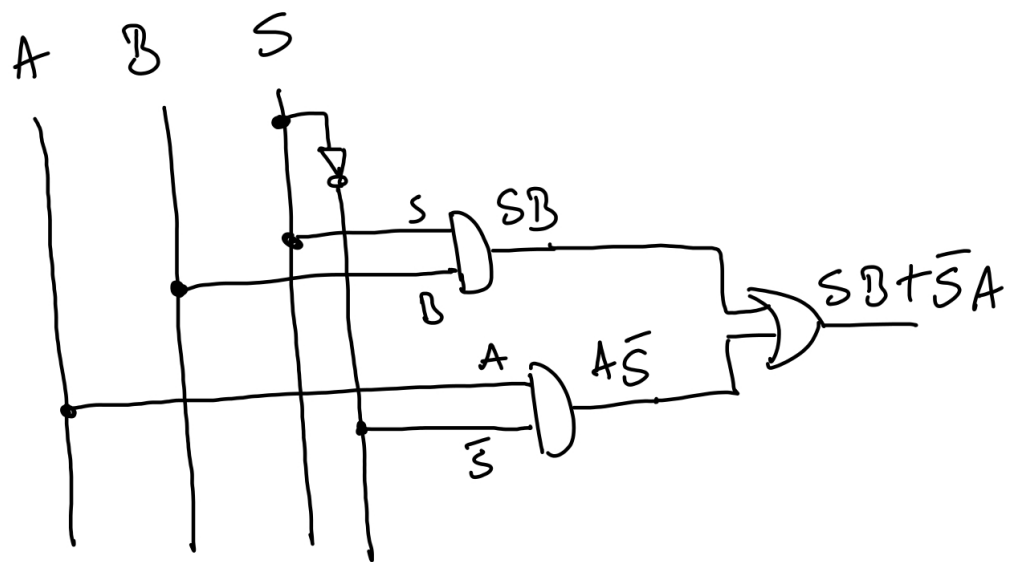
A	B	S	OUT
0	0	0	0
0	1	0	0
1	0	0	1
1	1	0	1
0	0	1	0
0	1	1	1
1	0	1	0
1	1	1	1



$$T_1 = SB$$

$$\text{OUT} = T_1 + T_2 = SB + \bar{S}A$$

Schema cu porți:



Schema cu porți și -XIU:

