



Bases de l'architecture pour la programmation LIFASR 3

4. Tableaux de Karnaugh

Trouvez les fonctions déterminées par les tableaux suivants :

| | | | | |
|---------|----|----|----|----|
| ab \ cd | 00 | 01 | 11 | 10 |
| 00 | 0 | 0 | 1 | 0 |
| 01 | 1 | 1 | 1 | 0 |
| 11 | 0 | 1 | 1 | 1 |
| 10 | 0 | 1 | 0 | 0 |

M = $\bar{a}\bar{c}d + abc\bar{c} + acd + \bar{a}bc$

| | | | | |
|---------|----|----|----|----|
| ab \ cd | 00 | 01 | 11 | 10 |
| 00 | 1 | 0 | 1 | X |
| 01 | 0 | 1 | X | X |
| 11 | 1 | 1 | X | X |
| 10 | 0 | 1 | 1 | 1 |

N =

| | | | | |
|---------|----|----|----|----|
| ab \ cd | 00 | 01 | 11 | 10 |
| 00 | 0 | 1 | X | 0 |
| 01 | 1 | X | 0 | 1 |
| 11 | 1 | 0 | X | 1 |
| 10 | X | 0 | 1 | X |

P =

| | | | | |
|---------|----|----|----|----|
| ab \ cd | 00 | 01 | 11 | 10 |
| 00 | 0 | 0 | 1 | 0 |
| 01 | 1 | 0 | 1 | 1 |
| 11 | 1 | 1 | 1 | 1 |
| 10 | 0 | 0 | 1 | 0 |

R =

| | | | | |
|---------|----|----|----|----|
| ab \ cd | 00 | 01 | 11 | 10 |
| 00 | 0 | 1 | 1 | 0 |
| 01 | 1 | 0 | 0 | 1 |
| 11 | 1 | 0 | 0 | 1 |
| 10 | 0 | 1 | 1 | 0 |

S =

| | | | | |
|---------|----|----|----|----|
| ab \ cd | 00 | 01 | 11 | 10 |
| 00 | 0 | X | 1 | 0 |
| 01 | 1 | 1 | 1 | X |
| 11 | 0 | X | 1 | X |
| 10 | 0 | 1 | 0 | X |

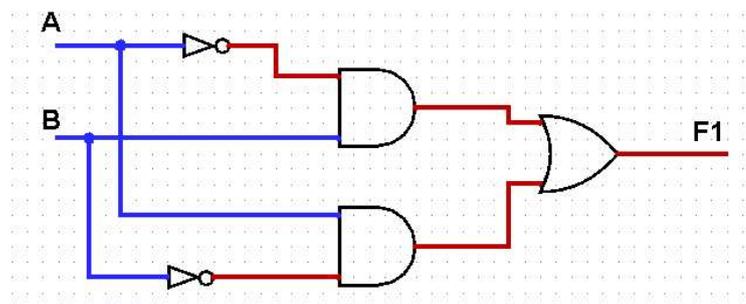
T =

5. Donnez le logigramme des fonctions suivantes :

F1 = $\bar{A}.B + A.\bar{B}$

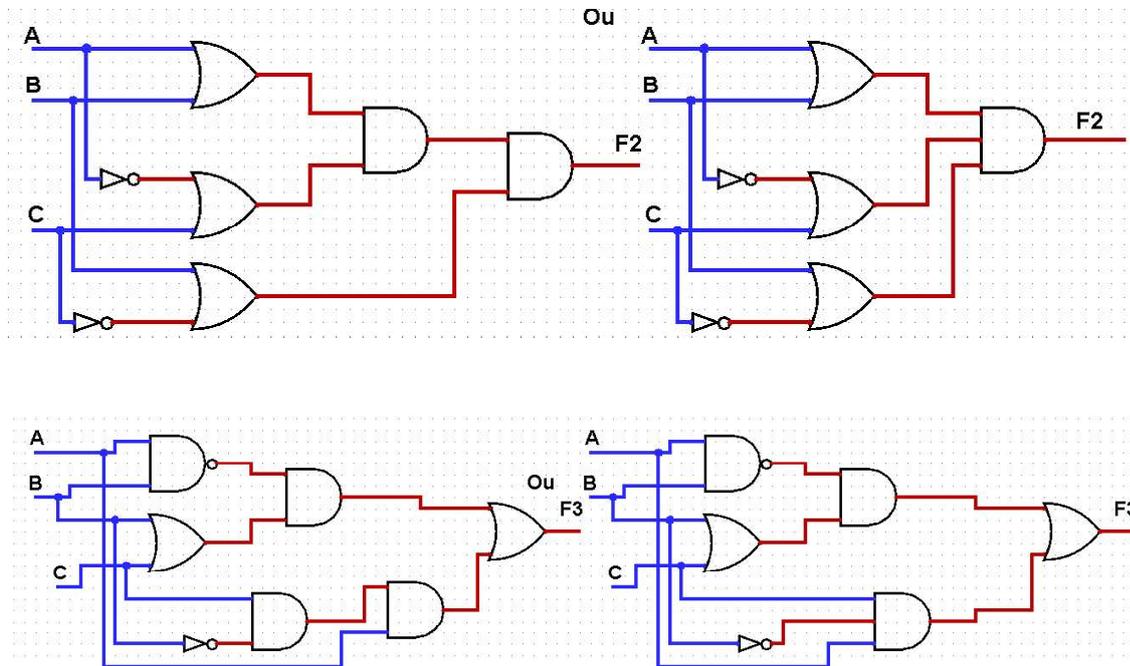
F2 = $(A + B).(\bar{A} + C).(B + \bar{C})$

F3 = $(\bar{A}.\bar{B}).(C + B) + A.\bar{B}.C$





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6. Simplifiez la fonction F:

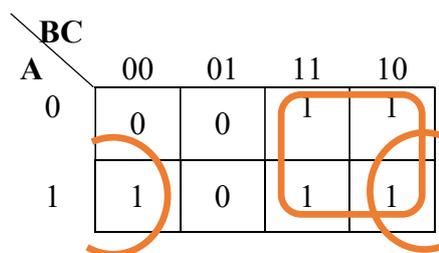
$$F(A,B,C) = \bar{A}B.C + \bar{A}B.\bar{C} + A.B.\bar{C} + ABC + \bar{A}\bar{B}\bar{C}$$

- 1) Par la méthode analytique
- 2) Par les tableaux de **Karnaugh**

Analytiquement :

$$\begin{aligned} F(A,B,C) &= \bar{A}B.C + \bar{A}B.\bar{C} + A.B.\bar{C} + ABC + \bar{A}\bar{B}\bar{C} = \bar{A}B.(C + \bar{C}) + A.B.(C + \bar{C}) + \bar{A}\bar{B}\bar{C} \\ &= \bar{A}B. + A.B. + \bar{A}\bar{B}\bar{C} = B + \bar{A}B\bar{C} = B + \bar{A}\bar{C} \end{aligned}$$

| A | B | C | F |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 |



$$F(A,B,C) = B + \bar{A}\bar{C}$$