

Mapas de Karnaugh

2 variables

BMP

| | A | B |
|----|---|---|
| C0 | 0 | 0 |
| C1 | 0 | 1 |
| C2 | 1 | 0 |
| C3 | 1 | 1 |

→ Adyacencia

NO < 00 > Si
NO < 01 > Si
NO < 10 > Si
NO < 11 > Si

| | B | 0 | 1 |
|---|---|----------|----------|
| A | 0 | C0 00 | C1 01 |
| 1 | | C2 10 | C3 11 |

| | \bar{B} | B |
|-----------|-----------|---|
| \bar{A} | | |
| A | | |

| | B | 0 | 1 |
|---|---|---|---|
| A | 0 | | |
| 1 | | | |

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

| | B | 0 | 1 |
|---|----|------|------|
| A | 0 | c0 | 1 c1 |
| 1 | c2 | 1 c3 | |

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

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

$$F = B(1)$$

$$\underline{F = B}$$

$$\boxed{F = B}$$

$\overset{3}{1} 0 1 0 \overset{0}{0} \leftarrow \text{bmp}$
 $\uparrow \qquad \qquad \uparrow$
 $\rightarrow \text{BMP}$

$$\rightarrow A + \bar{A} = 1$$

\rightarrow conjuntos.

no. de elementos que sean potencia de 2

1, 2, 4, 8, 16

.....

Mapa de 3 variables

| BMP | A | B | C | F |
|----------------|---|---|---|---|
| c ₀ | 0 | 0 | 0 | |
| c ₁ | 0 | 0 | 1 | |
| c ₂ | 0 | 1 | 0 | |
| c ₃ | 0 | 1 | 1 | |
| c ₄ | 1 | 0 | 0 | |
| c ₅ | 1 | 0 | 1 | |
| c ₆ | 1 | 1 | 0 | |
| c ₇ | 1 | 1 | 1 | |

| BC | | 00 | 01 | 11 | 10 |
|----|---|----------------|----------------|----------------|----------------|
| A | 0 | c ₀ | c ₁ | c ₃ | c ₂ |
| | 1 | c ₄ | c ₅ | c ₇ | c ₆ |

| C | | 0 | 1 |
|----|----|----------------|----------------|
| AB | 00 | c ₀ | c ₁ |
| | 01 | c ₂ | c ₃ |
| | 11 | c ₆ | c ₇ |
| | 10 | c ₄ | c ₅ |

| | A | B | C | F |
|----------------|---|---|---|---|
| C ₀ | 0 | 0 | 0 | 0 |
| C ₁ | 0 | 0 | 1 | 0 |
| C ₂ | 0 | 1 | 0 | 1 |
| C ₃ | 0 | 1 | 1 | 1 |
| C ₄ | 1 | 0 | 0 | 1 |
| C ₅ | 1 | 0 | 1 | 0 |
| C ₆ | 1 | 1 | 0 | 0 |
| C ₇ | 1 | 1 | 1 | 1 |

| A \ BC | 00 | 01 | 11 | 10 |
|--------|----|----|----|----|
| 0 | 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 | 0 |

$$F = A\bar{B}\bar{C} + BC + \bar{A}B$$

$$F = (A + B + C) \cdot (B + C) (A + B)$$

Ejerc.

| A \ BC | 00 | 01 | 11 | 10 |
|--------|----|----|----|----|
| 0 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 |

$$d = 1$$

Mapas de 4 variables:

| AB \ CD | | | | |
|---------|----|-----|-----|-----|
| | 00 | 01 | 11 | 10 |
| 00 | C0 | C1 | C3 | C2 |
| 01 | C4 | C5 | C7 | C6 |
| 11 | C8 | C13 | C15 | C14 |
| 10 | C9 | C10 | C11 | C12 |

| ABCD | F |
|------|-----|
| 0000 | C0 |
| 0001 | C1 |
| 0010 | C2 |
| 0011 | C3 |
| 0100 | C4 |
| 0101 | C5 |
| 0110 | C6 |
| 0111 | C7 |
| 1000 | C8 |
| 1001 | C9 |
| 1010 | C10 |
| 1011 | C11 |
| 1100 | C12 |
| 1101 | C13 |
| 1110 | C14 |
| 1111 | C15 |

Example:

| AB \ CD | | | | |
|---------|----|----|----|----|
| | 00 | 01 | 11 | 10 |
| 00 | 1 | 1 | . | 1 |
| 01 | . | 1 | . | . |
| 11 | . | . | . | . |
| 10 | 1 | 1 | . | 1 |

$$F = \bar{C}D + \bar{B}\bar{D}$$

| AB \ CD | | | | |
|---------|----|----|----|----|
| | 00 | 01 | 11 | 10 |
| 00 | 1 | . | . | 1 |
| 01 | 1 | . | . | 1 |
| 11 | . | 1 | 1 | . |
| 10 | . | 1 | . | . |

$$F = \sum m(0, 2, 4, 6, 13, 15, 9)$$

$$F = \bar{A}\bar{D} + ABD + A\bar{C}D$$

Caso Especial:

| A \ B C | | | | |
|---------|----|----|----|----|
| | 00 | 01 | 11 | 10 |
| 0 | 1 | | 1 | |
| 1 | | 1 | | 1 |

1. Escribir la función completa

2. Factorizar la función

$$\left. \begin{aligned} \overline{A}B + A\overline{B} &= A \oplus B \\ AB + \overline{A}\overline{B} &= A \odot B \end{aligned} \right\}$$

$$\left. \begin{aligned} A \oplus B &= \overline{A \odot B} \\ A \odot B &= \overline{A \oplus B} \end{aligned} \right\}$$

$$F = \overline{A}\overline{B}\overline{C} + \overline{A}BC + A\overline{B}C + AB\overline{C}$$

$$F = \overline{A}(\underbrace{\overline{B}\overline{C} + BC}_{B \odot C}) + A(\underbrace{\overline{B}C + B\overline{C}}_{B \oplus C})$$

$$F = \overline{A}(B \odot C) + A(B \oplus C)$$

$$F = \overline{A}(B \odot C) + A(\overline{B \odot C})$$

\downarrow
 X

\downarrow
 \overline{X}

$$F = \overline{A}X + A\overline{X}$$

$$F = A \oplus X$$

$$F = A \oplus B \odot C$$