

1.Función f

| | x | y | f |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 |
| 2 | 1 | 0 | 1 |
| 3 | 1 | 1 | 0 |

La función f obtenida de manera experimental es:

$$\overline{[x \cdot (\overline{x \cdot y})]} = \overline{[y \cdot (\overline{x \cdot y})]} = \overline{x \cdot \overline{y}} + \overline{\overline{x} \cdot y} = (x \cdot y) + (\overline{x} \cdot \overline{y})$$

$$f(x, y) = \sum_m (1, 2)$$

Minimizaremos f usando mapas de Karnaugh

| x \ y | 0 | 1 |
|-------|---|---|
| 0 | 0 | 1 |
| 1 | 1 | 0 |

La función minimizada es:

$$f_{\min} = x \cdot \overline{y} + \overline{x} \cdot y$$

$$\overline{f_{\min}} = \overline{x \cdot \overline{y} + \overline{x} \cdot y}$$

Los circuitos AND/OR y NAND/NAND se adjuntan en el archivo.

Función g

| | x | y | g |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 |
| 2 | 1 | 0 | 1 |
| 3 | 1 | 1 | 0 |

La función g obtenida de manera experimental es:

$$\overline{x \cdot y} \cdot (x + y) = x \cdot \overline{x \cdot y} + y \cdot \overline{x \cdot y} = x \cdot \overline{y} + \overline{x} \cdot y = \overline{x \cdot \overline{y} + \overline{x} \cdot y}$$

$$g(x, y) = \sum_m (1, 2)$$

Minimizaremos g usando mapas de Karnaugh

| x \ y | 0 | 1 |
|-------|---|---|
| 0 | 0 | 1 |
| 1 | 1 | 0 |

La función minimizada es

$$g_{\min} = x \cdot \overline{y} + \overline{x} \cdot y$$

$$\overline{g_{\min}} = \overline{x \cdot \overline{y} + \overline{x} \cdot y}$$

Los circuitos AND/OR y NAND/NAND se adjuntan en el archivo

2.

Tabla de Verdad

| | A | B | C | D | f |
|----|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 | 0 |
| 2 | 0 | 0 | 1 | 0 | 0 |
| 3 | 0 | 0 | 1 | 1 | 1 |
| 4 | 0 | 1 | 0 | 0 | 0 |
| 5 | 0 | 1 | 0 | 1 | 1 |
| 6 | 0 | 1 | 1 | 0 | 1 |
| 7 | 0 | 1 | 1 | 1 | 1 |
| 8 | 1 | 0 | 0 | 0 | 0 |
| 9 | 1 | 0 | 0 | 1 | 1 |
| 10 | 1 | 0 | 1 | 0 | 1 |
| 11 | 1 | 0 | 1 | 1 | 1 |
| 12 | 1 | 1 | 0 | 0 | 1 |
| 13 | 1 | 1 | 0 | 1 | 1 |
| 14 | 1 | 1 | 1 | 0 | 1 |
| 15 | 1 | 1 | 1 | 1 | 1 |

Mapa de Karnaugh

| AB \ CD | 00 | 01 | 11 | 10 |
|---------|----|----|----|----|
| 00 | 0 | 0 | 1 | 0 |
| 01 | 0 | 1 | 1 | 1 |
| 11 | 1 | 1 | 1 | 1 |
| 10 | 0 | 1 | 1 | 1 |

Función AND/OR (mínima)

$$f = c \cdot d + a \cdot b + b \cdot d + a \cdot d + b \cdot c + a \cdot c$$

Función NAND/NAND (mínima)

$$\bar{f} = \overline{c \cdot d + a \cdot b + b \cdot d + a \cdot d + b \cdot c + a \cdot c}$$