Lógica Digital (1001351)

Mapas de Karnaugh

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Mapas de Karnaugh

Mapas de Karnaugh

Row number	x_1	x_2	x_3	f
0	0	0	0	1
1	0	0	1	0
2	0	1	0	1
3	0	1	1	0
4	1	0	0	1
5	1	0	1	1
6	1	1	0	1
7	1	1	1	0

Figure 2.48 The function $f(x_1, x_2, x_3) = \sum m(0, 2, 4, 5, 6)$.

Row number	x_1	x_2	x_3	$f = \overline{x}_3$
0	0	0	0	1
1	0	0	1	0
2	0	1	0	1
3	0	1	1	0
4	1	0	0	1
5	1	0	1	1
6	1	1	0	1
7	1	1	1	0

Figure 2.48 The function $f(x_1, x_2, x_3) = \sum m(0, 2, 4, 5, 6)$.

Mapas de Karnaugh

Row number	x_1	x_2	x_3	f
0	0	0	0	1
1	0	0	1	0
2	0	1	0	1
3	0	1	1	0
4	1	0	0	1
5	1	0	1	1
6	1	1	0	1
7	1	1	1	0

$+x_1\overline{x}_2$

Figure 2.48 The function $f(x_1, x_2, x_3) = \sum m(0, 2, 4, 5, 6)$.

Mapas de Karnaugh

Row number	x_1	x_2	x_3	$f = \overline{x}_3 + x_1\overline{x}_2$
0	0	0	0	1
1	0	0	1	0
2	0	1	0	1
3	0	1	1	0
4	1	0	0	1
5	1	0	1	1
6	1	1	0	1
7	1	1	1	0

Figure 2.48 The function $f(x_1, x_2, x_3) = \sum m(0, 2, 4, 5, 6)$.

Row number	x_1	x_2	x_3	$f = \bar{x}_3 + x_1\bar{x}_2$
0	0	0	0	1
1	0	0	1	0
2	0	1	0	1
3	0	1	1	0
4	1	0	0	1
5	1	0	1	1
6	1	1	0	1
7	1	1	1	0

	x_1	x_2	x_3
m_0	0	0	0
m_2	0	1	0
m_4	1	0	0
m_6	1	1	0

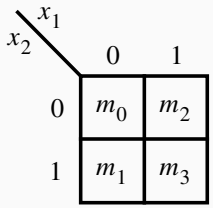
	x_1	x_2	x_3
m_4	1	0	0
m_5	1	0	1

Figure 2.48 The function $f(x_1, x_2, x_3) = \sum m(0, 2, 4, 5, 6)$.

Mapas de Karnaugh: duas variáveis

x_1	x_2	
0	0	m_0
0	1	m_1
1	0	m_2
1	1	m_3

(a) Truth table



(b) Karnaugh map

Figure 2.49 Location of two-variable minterms.

$$
\begin{aligned}
m_2 + m_3 &= x_1\bar{x}_2 + x_1x_2 \\
&= x_1(\bar{x}_2 + x_2) \\
&= x_1 \cdot 1 \\
&= x_1
\end{aligned}
$$

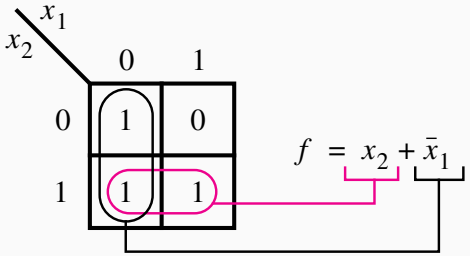
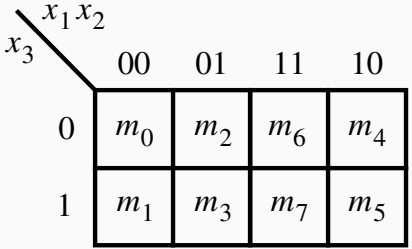


Figure 2.50 The function of Figure 2.19.

Mapas de Karnaugh: três variáveis

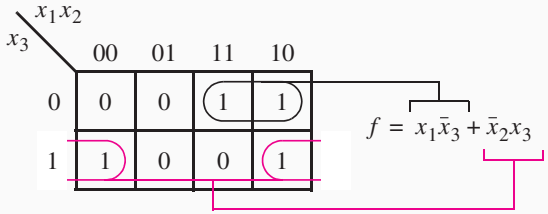
x_1	x_2	x_3	
0	0	0	m_0
0	0	1	m_1
0	1	0	m_2
0	1	1	m_3
1	0	0	m_4
1	0	1	m_5
1	1	0	m_6
1	1	1	m_7

(a) Truth table

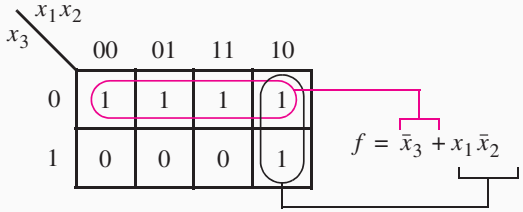


(b) Karnaugh map

Mapas de Karnaugh: três variáveis

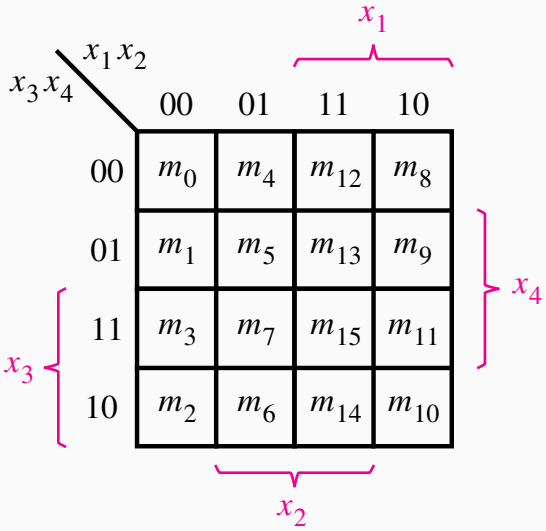


(a) The function of Figure 2.23

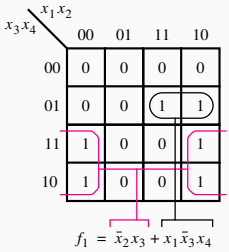


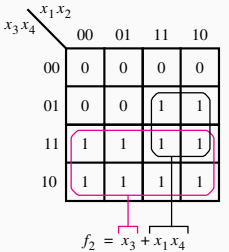
(b) The function of Figure 2.48

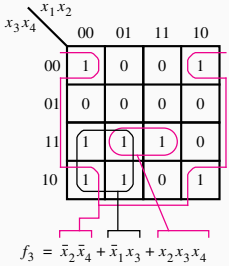
Mapas de Karnaugh: quatro variáveis

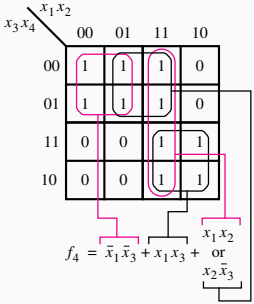


Mapas de Karnaugh: quatro variáveis









Mapas de Karnaugh: cinco variáveis

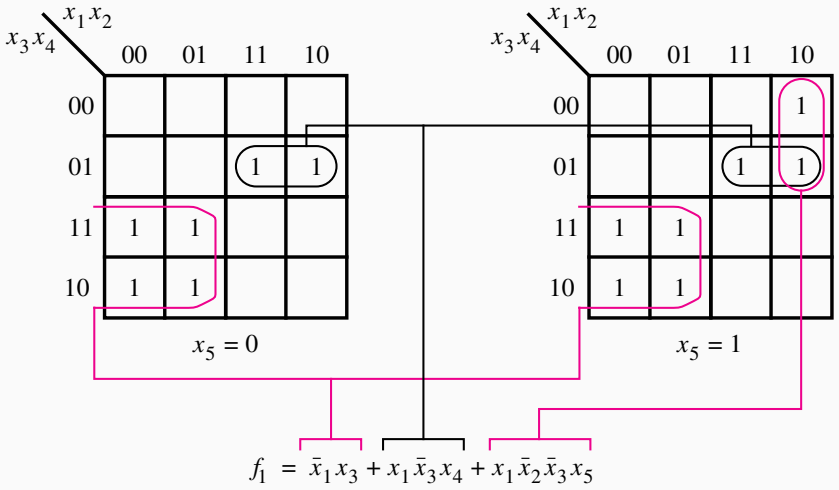


Figure 2.55 A five-variable Karnaugh map.

Bibliografia

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- Brown, S. & Vranesic, Z. - Fundamentals of Digital Logic with Verilog Design, 3rd Ed., Mc Graw Hill, 2009

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