

Karnough Map

Bool fonksiyonları Sadeleştirme
Yöntemidir

m_0	m_1
m_2	m_3

	y	0	1
x	0	0	0
	1	1	0

$$\underline{F_2 = xy'}$$

x	y	F_2
0	0	0
0	1	0
1	0	1
1	1	0

$$F_1 = \underline{x \cdot y}$$

x	y	F_1
0	0	0
0	1	0
1	0	0
1	1	1

		y	
x	y	0	1
	0	0	0
1	1	0	1

$$F_3 = x \cdot y' + x' \cdot y$$

X	y	F ₃
0	0	0 · m ₀
0	1	1 · m ₁
1	0	1 · m ₂
~~1~~	~~1~~	0 · m ₃

		y	
		0	1
x	0	0	1
	1	1	0

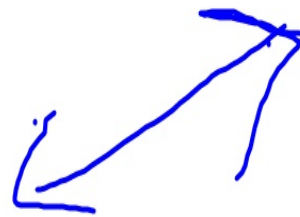
$$f_1 = m_1 + m_2$$

$$F_1 = M_3 \cdot M_0$$

$$F_5 = y'$$

x	y	F_5
0	0	1
0	1	0
1	0	1
1	1	0

		y	
		0	1
x	0	1	0
	1	1	0



$$F_4 = x$$

x	y	F_4
0	0	0
0	1	0
1	0	1
1	1	1

		y	
		0	1
x	0	0	0
	1	1	1

$$F_6 = x'.y' + x'.y + x.y'$$

$$= \underline{x' + y'}$$

		y	
		0	1
x	0	1	1
	1	1	0

		y	
		0	1
x	0	1	1
	1	1	0

$$F_7 = 1$$

		y	
		0	1
x	0	1	1
	1	1	1

$$F_b = 0$$

y x	y ϕ
x (1)	

		z				
		y		z		
		00	01	11	10	
x	0	0	0	1	1	
	1	1	1	1	1	

→ $y \cdot z'$

$$F_1 = xy' + yz + yz'$$

$$\downarrow F_1 = xy' + y$$

$$F_1 = x + y$$

$$F_1 = xy' + y$$

$\overbrace{yz}^x$

$x \backslash yz$	00	01	11	10
0	0	0	1	1
1	1	1	1	1

The Karnaugh map shows two groups of 1s:

- A red circle highlights the 1s in the row where $x=1$ (cells 11, 10, 01, 00).
- A green circle highlights the 1s in the column where $yz=11$ (cells 01, 11).

$$\underline{F_1 = x + y}$$

		y			
		00	01	11	10
x	0	0	0	1	1
	1	1	1	1	1

The Karnaugh map for the function $F_1 = x + y$ is shown. The map is a 2x4 grid with columns labeled 00, 01, 11, 10 and rows labeled 0, 1. The values in the cells are 0, 0, 1, 1 for row 0 and 1, 1, 1, 1 for row 1. A green circle groups the cells (0, 11) and (0, 10), and a red circle groups the cells (1, 00), (1, 01), (1, 11), and (1, 10).

$$F_z = y'z' + yz$$

yz: z y

	00	01	11	10
x y	1	0	1	0
1	1	0	1	0

The Karnaugh map shows two groups of 1s circled: a green circle around the 1s in the first column (x=0) and a red circle around the 1s in the third column (x=1). Both groups represent the term z' in the simplified expression.

$$F_3 = y'z + yz'$$

A Karnaugh map for the function $F_3 = y'z + yz'$. The map is a 2x4 grid with columns labeled 00, 01, 11, 10 and rows labeled 0, 1. The top row is labeled with y_2 and the bottom row with x . The columns are labeled with y and z . The map shows the function's values and prime implicants.

	00	01	11	10
0	0	1	0	1
1	0	1	0	1

The prime implicants are highlighted with green and red loops. The green loop covers the cells (0,1) and (1,1), representing the term $y'z$. The red loop covers the cells (0,0) and (1,0), representing the term yz' .

$$F_4 = y'z' + yz'$$

yz x	00	01	11	10
0	1	0	0	1
1	1	0	0	1

$$F_4 = \underline{z'}(y' + y)$$

yz x	00	01	11	10
0	1	0	0	1
1	1	0	0	1

$$\underline{F_5 = xz'}$$

$x \backslash z$	00	01	11	10
	0	1	1	0
0	0	0	0	0
1	1	0	0	1

		z		y	
		yz			
wx		00	01	11	10
x w	00	m_0	m_1	m_2	m_3
	01	m_4	m_5	m_6	m_7
	11	m_8	m_9	m_{10}	m_{11}
	10	m_{12}	m_{13}	m_{14}	m_{15}

$$m_9 = wx y' z$$

$$m_{11} = wx y z'$$

$$m_{14} = wx' y z$$

$$F_1 = x'z' + z'w'$$

y

w, x

y, z

	00	01	11	10
00	1	0	0	1
01	1	0	0	1
11	0	0	0	0
10	1	0	0	1

w

Ödev:

$$F_2 = w \cdot x' + x \cdot y \cdot z' + w \cdot y' \cdot z'$$