OSNOVE DIGITALNIH VEZIJ

4. Domača naloga

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Mojca Kompara

Naj bo f preklopna funkcija podana s predpisom

$f(x1, x2, x3, x4) = (x1 \uparrow x2) \rightarrow (x3 \downarrow x4)$.

Z uporabo osnovnih zaprtih razredov dokažite, da je {f, 0} funkcijsko poln nabor.

T_0: $(0 \uparrow 0) \rightarrow (0 \downarrow 0) = 1$; $\notin T_0$

T_1: $0 \neq 1$; $\notin T_1$

$$\text{S: } \left.\begin{array}{l} f(0,0,0,0) = 1 \\ f(1,1,1,1) = 1 \end{array}\right\} \quad 1 \neq \bar{0} \qquad \notin S$$

L: $f(x_1, x_2, x_3, x_4)L = a_0 \nabla a_1 x_1 \nabla a_2 x_2 \nabla a_3 x_3 \nabla a_4 x_4$

$f(0,0,0,0) = a_0 \nabla 0 \nabla 0 \nabla 0 \nabla 0 = a_0 \quad (a_0 = 1)$

$f(0,0,0,1) = 1 \nabla 0 \nabla 0 \nabla 0 \nabla a_4 = \overline{a_4} \quad (a_4 = 1)$

$f(0,0,1,0) = 1 \nabla 0 \nabla 0 \nabla a_3 \nabla 1 = a_3 \quad (a_3 = 0)$

$f(0,1,0,0) = 1 \nabla 0 \nabla a_2 \nabla 0 \nabla 1 = a_2 \quad (a_2 = 1)$

$f(1,0,0,0) = 1 \nabla a_1 \nabla 1 \nabla 0 \nabla 1 = \overline{a_1} \quad (a_1 = 1)$

$$\left.\begin{array}{l} f(1,1,1,1)L = 0 \\ f(1,1,1,1) = 1 \end{array}\right\} \qquad \notin L$$

x_1	x_2	x_3	x_4	$f(x_1, x_2, x_3, x_4)$
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

M: $f(0,0,0,0) = 1$

$f(0,0,0,1) = 0$ $\notin M$

$(0,0,0,0) < (0,0,0,1)$; $1 \leq 0$

Nabor {f, 0} je funkcijsko poln sistem, ker odpira vse osnovne zaprte razrede.