4. izpit 15.09. 08

① $(\nabla, \&, 1)$

T_0: $0 \nabla 0 = 0$

$0 \& 0 = 0$

$1 \neq 0$

T_1: $1 \nabla 1 = 0 \neq 1$

$1 \& 1 = 1$

$1 = 1$

S: $x_1 \nabla x_2 \overset{?}{=} \overline{\overline{x_1} \nabla \overline{x_2}}$

$= \overline{x_1 \equiv \overline{x_2}}$

$\overline{x_1} \equiv x_2 \neq \overline{x_1} \equiv \overline{x_2}$

$1 \neq \overline{1}$

$x_1 \& x_2 \overset{?}{=} \overline{\overline{x_1} \& \overline{x_2}}$

$x_1 \& x_2 \neq x_1 \vee x_2$

L: ∇

$x_1 \nabla x_2 \overset{?}{=} a_0 \nabla a_1 x_1 \nabla a_2 x_2$

$f(0,0) = a_0 \nabla a_1 0 \nabla a_2 0 = a_0$

$0 \nabla 0 = 0 \rightarrow a_0 = 0$

$f(0,1) = a_0 \nabla a_2$

$0 \nabla 1 = 1 \rightarrow a_2 = 1$

$f(1,0) = a_0 \nabla a_1$

$1 \nabla 0 = 1 \rightarrow a_1 = 1$

$f(1,1) = a_0 \nabla a_1 \nabla a_2$

$0 \nabla 1 \nabla 1 = 0$ alpira

$\neq 1$

&

$x_1 \& x_2$

$f(0,0) = a_0$

$0 \& 0 = 0 \rightarrow a_0 = 0$

$f(0,1) = a_0 \nabla a_2$

$0 \& 1 = 0 \rightarrow a_2 = 0$

$f(1,0) = a_0 \nabla a_1$

$1 \& 0 = 0 \rightarrow a_1 = 0$

$f(1,1) = a_0 \nabla a_1 \nabla a_2$

$1 \& 1 = 1 \rightarrow a_0 \nabla a_1 \nabla a_2 = 1$?

$0 \nabla 0 \nabla 0 = 0$ alpira

1

$1 = 1$ ne alpira

M

	$x_1 \nabla x_2$	$x_1 \& x_2$
$00 < 01$	$f(0,0) < f(0,1)$	$\leq$
$00 < 10$	$f(0,0) < f(1,0)$	$\leq$
$00 < 11$	$f(0,0) \leq f(1,1)$	$<$
01×10		
$01 < 11$	$f(0,1) > f(1,1)$	$<$
$10 < 11$	$f(1,0) > f(1,1)$	$<$

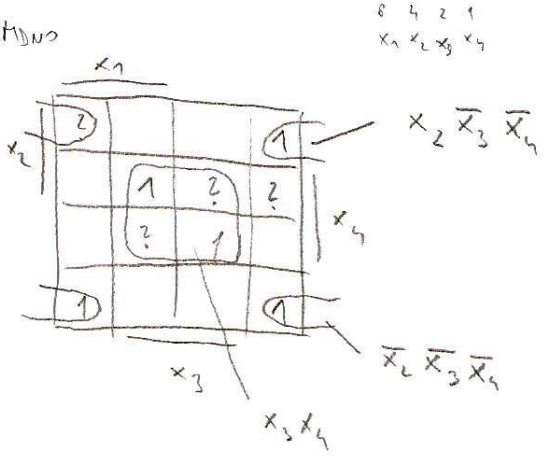
1

	T_0	T_1	L	S	M
$x_1 \nabla x_2$	$\in$	$\notin$	$\notin$	$\notin$	$\notin$
$x_1 \& x_2$	$\in$	$\in$	$\notin$	$\notin$	$\in$
1	$\notin$	$\in$	$\in$	$\notin$	$\in$

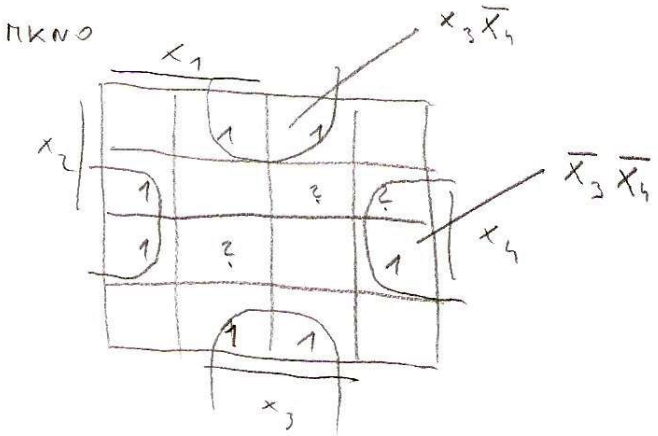
Nabor je funkcijsko poln, ker se vsi razredi odpirajo!

2. MNO? $V^4(0,3,4,8,15)\ V_?^4(5,7,11,12)$

→ MDNO



MKNO



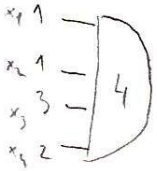
MDNO: $f(x_1,x_2,x_3,x_4) = x_3x_4 \vee x_2\bar{x}_3\bar{x}_4 \vee \bar{x}_2\bar{x}_3\bar{x}_4$ [4/11]

MKNO: $f(x_1,x_2,x_3,x_4) = \overline{\bar{x}_3\bar{x}_4 \vee \bar{x}_3\bar{x}_4}$

$= (\bar{x}_3 \vee x_4)(x_3 \vee x_4)$ [3/6]

MNO = MKNO, ker za realizacijo le-te potrebujemo manjše število vhodov in logičnih operatorjev

4. (1,1,3,2 ; 4), MUX 8/1 $f(x_1,x_2,x_3,x_4) = x_1x_3 \vee x_2x_3 \vee x_1x_2x_3 \vee x_3x_4$



$x_1 + x_3 \geq 4$

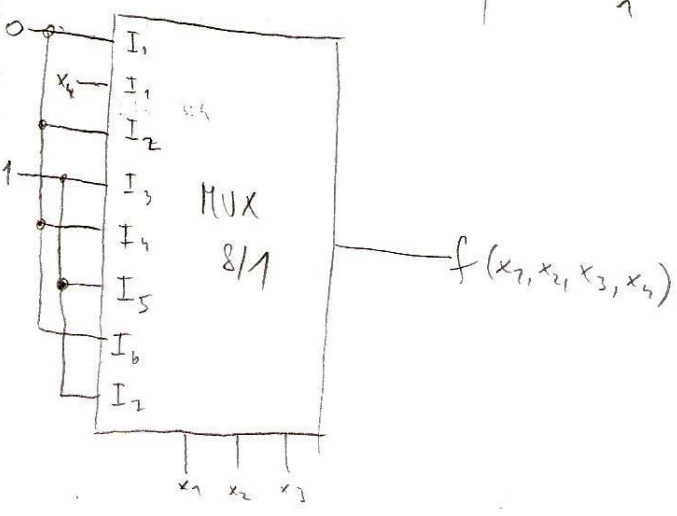
$x_2 + x_3 \geq 4$

$x_1 + x_2 + x_3 \geq 4 = 5$

$x_3 + x_4 = 5 \geq 4$

x_1	x_2	x_3	x_4	f
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

	x_1	x_2	x_3	$f(x_1,x_2,x_3,0)$	$f(x_1,x_2,x_3,1)$	$f(x_1,x_2,x_3,x_4)$
I_0	0	0	0	0	1	0
	0	0	1	0	1	x_4
	0	1	0	0	1	1
	0	1	1	1	0	1
	1	0	0	0	1	0
	1	0	1	1	0	1
	1	1	0	0	1	0
I_7	1	1	1	1	0	1



4. Izpit 15.09.08

⑤ $x \vee 1 = 1$

$= (x \vee 1) \cdot 1$ P2*

$= (x \vee 1) \cdot (x \vee \bar{x})$ P5

$= x \vee (1 \cdot \bar{x})$ P4

$= x \vee (\bar{x} \cdot 1)$ P3*

$= x \vee \bar{x}$ P2*

$= 1$ P5

③ Moor → Mealy

	z_3	z_2	z_1
	A	B	C
a	B	A	C
b	A	A	C
c	C	C	A

$A_{no} = \{X, b, z, \delta, \lambda\}$ $A_{ne} = \{X, A, z, \delta, \lambda\}$

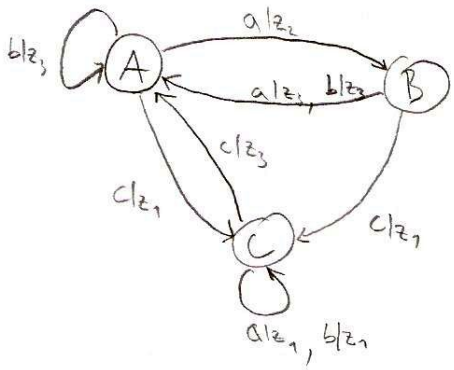
$X = \{a, b, c\}$ $X_{no} = X_{ne}$

$B = \{A, B, C\}$ $z_{no} = z_{ne}$

$z = \{z_1, z_2, z_3\}$

MEALY

	A	B	C
a	$B\|z_2$	$A\|z_3$	$C\|z_1$
b	$A\|z_3$	$A\|z_3$	$C\|z_1$
c	$C\|z_1$	$C\|z_1$	$A\|z_3$



③ 1. fronta $x \rightarrow x_2$

$x_1 \rightarrow x_2 = \overline{x_1} \vee x_2$

$\overline{(\overline{x_1} \vee x_2)} = \overline{\overline{x_1}}\,\overline{x_2} \vee x_1\overline{x_2} \vee \overline{\overline{x_1}}\,x_2$

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④ $x_2 \vee (x_1 \equiv x_3)$ ∨ PPNO

$= x_2 \vee (x_1x_3 \vee \overline{x_1}\,\overline{x_3}) = x_1x_2x_3 \vee \overline{x_1}x_2\overline{x_3}$

x_1	x_2	x_3	$f(x_1,x_2,x_3)$	P
0	0	0	0	7
0	0	1	0	6
0	1	0	1	
0	1	1	0	4
1	0	0	0	3
1	0	1	0	2
1	1	0	0	1
1	1	1	1	

PPNO: $f(x_1,x_2,x_3) = \downarrow^3(7,6,4,3,2,1)$

$f(x_1,x_2,x_3) = (x_1 \downarrow x_2 \downarrow x_3) \downarrow (x_1 \downarrow x_2 \downarrow \overline{x_3}) \downarrow (x_1 \downarrow \overline{x_2} \downarrow \overline{x_3}) \downarrow (\overline{x_1} \downarrow x_2 \downarrow x_3) \downarrow$

$\downarrow (\overline{x_1} \downarrow x_2 \downarrow \overline{x_3}) \downarrow (\overline{x_1} \downarrow \overline{x_2} \downarrow \overline{x_3})$

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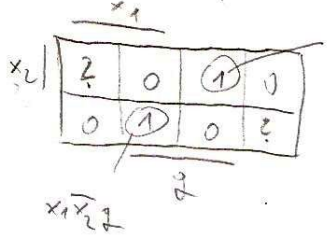
② z z5 ; $D^1q = \overline{x_1}\,\overline{x_2}\,q \vee \overline{x_1}\,x_2\,\overline{q} \vee x_1\,\overline{x_2}\,\overline{q} \vee x_1x_2\,q$

x_1	x_2	q	D^1q	r	s
0	0	0	0	?	0
0	0	1	1	?	0
0	1	0	1	0	1
0	1	1	0	0	1
1	0	0	1	0	?
1	0	1	0	1	0
1	1	0	0	?	0
1	1	1	1	0	?

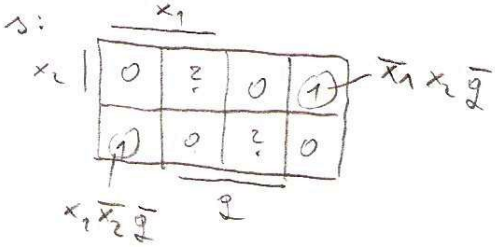
r	s	q	D^1q
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	X
1	1	1	X

q	D^1q	r	s
0	0	?	0
0	1	0	1
1	0	1	0
1	1	0	?

r:



s:



r: $\overline{x_1}x_2q \vee x_1\overline{x_2}q$

s: $x_1\overline{x_2}\overline{q} \vee \overline{x_1}x_2\overline{q}$