

1. Ugotovite ali je funkcija $f(x_1, x_2, x_3)$ linearna?

$$f(x_1, x_2, x_3) = ((f_1 \oplus \bar{f}_2) \oplus f_3) + (f_1 \oplus f_3)$$

NOR števce

ponelj rahaj je lineas

$$f_1(x_1, x_2, x_3) : S_{0,1,3}(\bar{x}_1, x_2, \bar{x}_3)$$

minimálna fkn

$$f_2(x_1, x_2, x_3) : S_{0,2}(x_1, x_2, \bar{x}_3)$$

$$f_3(x_1, x_2, x_3) : w_1 = w_2 = 2; w_3 = -1; P = 3$$

pravilna fkn

25%

minimálna

2. Funkcijo $f(x_1, \dots, x_5)$ realizirajte z multipleksorji z dvema izbirnima vhodoma.

$$f(x_1, \dots, x_5) = x_1 \bar{x}_2 \bar{x}_4 + \bar{x}_1 \bar{x}_2 x_3 x_4 \bar{x}_5 + \bar{x}_1 \bar{x}_2 x_4 x_5 + x_2 \bar{x}_3 \bar{x}_4 + x_2 x_3 x_4 \bar{x}_5 + x_1 x_2 \bar{x}_3 x_4$$

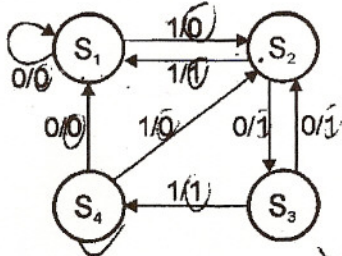
negativna

pozitivna

10%

(15%)

3. Mealeyev avtomat, podan z diagramom stanj, pretvorite v Moorov avtomat in ga realizirajte z minimalnim številom pomnilnih celic T.



eni manj fkn

15%

1.
1.
0.
1.
0.
1.
1.
(30%)

4. Za asinhronski števec po modulu štiri v Mooreovi izvedbi, ki šteje tudi vse nastopajoče fronte števnih impulzov, določite diagram prehajanja osnovnih stanj, tabelo prehajanja osnovnih stanj, vzbujaške in izhodne funkcije. Kodiranje tabele stanj izvedite s korakom ena.

kerja

števca ni mogoče

Mooreova

7.2.2007

417

⊙ $f(x_1, x_2, x_3) = ((l_1 \oplus \bar{l}_2) \oplus l_3) \downarrow (l_1 \downarrow l_3)$

$l_1 = S_{0,1,3}(x_1, x_2, x_3)$

$l_2 = S_{0,2}(x_1, x_2, x_3)$

$l_3 \text{ : } w_1 = w_2 = 2$
 $w_3 = -1$
 $p = 3$

6	7	3	2
4	5	1	0
0	1		
1	3		
2	3		
3	1		

~~$\bar{x}_1 \bar{x}_2 \bar{x}_3 + x_1 \bar{x}_2 \bar{x}_3 + \bar{x}_1 \bar{x}_2 x_3 + \bar{x}_1 x_2 \bar{x}_3 + x_1 x_2 \bar{x}_3$~~
 $l_1 = x_1 \bar{x}_2 \bar{x}_3 + \bar{x}_1 \bar{x}_2 x_3 + x_1 \bar{x}_2 x_3 + x_1 x_2 \bar{x}_3 + \bar{x}_1 x_2 \bar{x}_3$
 ~~$\bar{x}_1 \bar{x}_2 \bar{x}_3 + x_1 x_2 \bar{x}_3 + x_1 \bar{x}_2 x_3 + \bar{x}_1 x_2 x_3$~~
 $l_2 = \bar{x}_1 \bar{x}_2 x_3 + x_1 x_2 x_3 + x_1 \bar{x}_2 \bar{x}_3 + \bar{x}_1 x_2 \bar{x}_3$

~~ANALIZA~~

$x_1 x_2 x_3$	l_2	\bar{l}_2	l_1	$\bar{l}_1 = \bar{l}_2$	l_3	$(l_1 = \bar{l}_2) \oplus l_3$	$l_1 \downarrow l_3$	f
0 0 0	0	1	0	0	0	0	1	1
0 0 1	1	0	1	0	0	0	0	0
0 1 0	1	0	1	0	0	0	0	0
0 1 1	0	1	0	0	0	0	1	1
1 0 0	1	0	1	0	0	0	0	0
1 0 1	0	1	1	1	0	1	0	1
1 1 0	0	1	0	0	1	1	0	1
1 1 1	1	0	1	0	1	1	0	1

l_3 :

l_3	p_0
000	0
001	-1
010	2
011	1
100	2
101	+1
110	4
111	3

	x_1			
x_2	1 ₆	1 ₇	1 ₃	0 ₂
	0 ₄	1 ₅	0 ₁	1 ₀
	x_3			

$a_0 = 1$

$m_0 = a_0$
 $m_1 = a_0 \oplus a_3$
 $m_2 = a_0 \oplus a_2$
 $m_3 = a_0 \oplus a_2 \oplus a_3$
 $m_4 = a_0 \oplus a_1$
 $m_5 = a_0 \oplus a_1 \oplus a_3$
 $m_6 = a_0 \oplus a_1 \oplus a_2$
 $m_7 = a_0 \oplus a_1 \oplus a_2 \oplus a_3$

~~ANALIZA~~ $a_0 = 1$

$a_0 \oplus a_3 = 0 \rightarrow a_3 = 1$
 $a_0 \oplus a_2 = 0 \rightarrow a_2 = 1$
 $a_0 \oplus a_1 \oplus a_2 = 1 \rightarrow \checkmark$
 $a_0 \oplus a_1 = 0 \rightarrow a_1 = 1$
 $a_0 \oplus a_1 \oplus a_3 = 1 \checkmark$
 $a_0 \oplus a_1 \oplus a_2 = 1 \checkmark$
 $a_0 \oplus a_1 \oplus a_2 \oplus a_3 = 1 \checkmark \checkmark$

\rightarrow funkcija ni linearna

$1 \oplus 1 = 0$
 $0 \oplus 1 = 1$
 $1 \oplus 0 = 1$
 $0 \oplus 0 = 0$

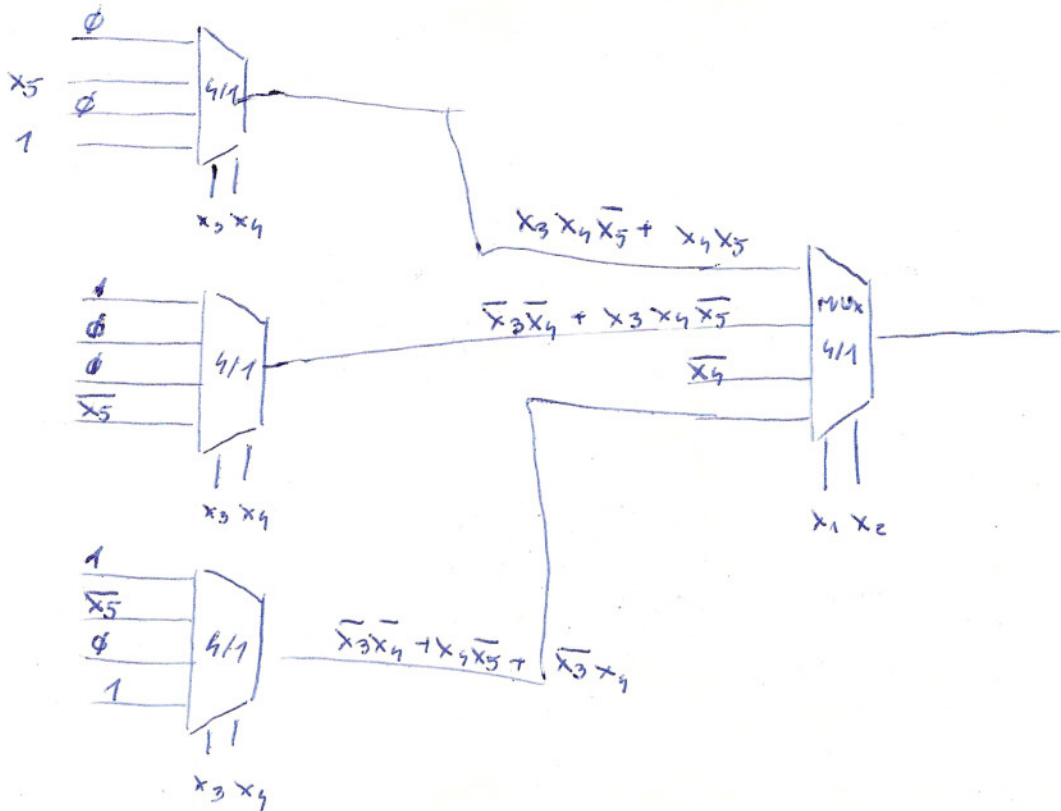
$a_0 = 1$
 $a_1 = 1$
 $a_2 = 1$
 $a_3 = 1$
 $a_0 \oplus a_1 \oplus a_2 \oplus a_3 = 0 \Rightarrow 0 \neq 1$

2.) Realizuj 2 MUX 4/1

$$P(x_1, x_2, x_3, x_4, x_5) = x_1 \bar{x}_2 \bar{x}_4 + \bar{x}_1 \bar{x}_2 x_3 x_4 \bar{x}_5 + \bar{x}_1 \bar{x}_2 x_4 x_5 + x_2 \bar{x}_3 \bar{x}_4 + x_2 \bar{x}_3 x_4 \bar{x}_5 + x_1 x_2 \bar{x}_3 x_4$$

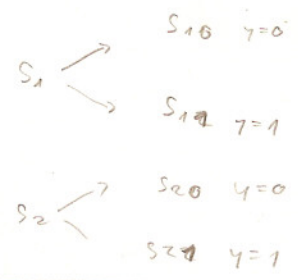
x_1	x_2	OSTANEK
(1) 0	0	$x_3 x_4 \bar{x}_5 + x_4 x_5$
(2) 0	1	$\bar{x}_3 \bar{x}_4 + x_3 x_4 \bar{x}_5$
(3) 1	0	\bar{x}_4
(4) 1	1	$\bar{x}_3 \bar{x}_4 + x_4 \bar{x}_5 + \bar{x}_3 x_4$

$x_3 x_4$	(1) ostanebn	2 ostanebn	(3) ostanebn
0 0	\emptyset	$\bar{x}_3 \bar{x}_4 + x_4 \bar{x}_5 + 1$	1
0 1	x_5	\emptyset	$\bar{x}_5 + 1 = \bar{x}_5$
1 0	\emptyset	\emptyset	\emptyset
1 1	$\bar{x}_5 + x_5 = 1$	\bar{x}_5	1

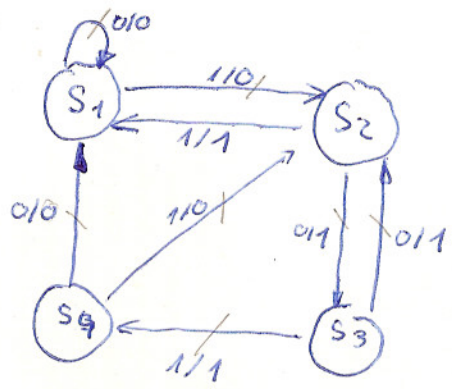


12	14	6	5
13	15	7	5
10	11	3	1
8	10	2	0

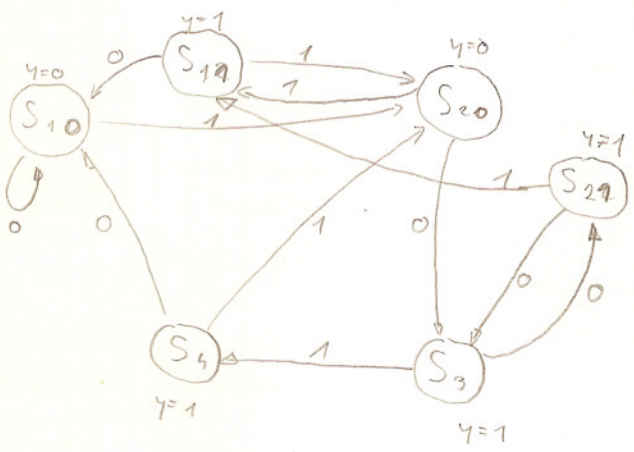
3.) MEALEY \rightarrow MOORE ^E
 REALIZIRAJ Z T \rightarrow MINIMIRANO



4/3



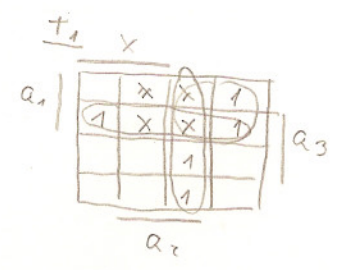
	x=0	x=1	y	$a_1 a_2 a_3$
S_{10}	S_{10}	S_{20}	0	000
S_{11}	S_{10}	S_{20}	1	001
S_{20}	S_3	S_{11}	0	010
S_{21}	S_3	S_{11}	1	011
S_3	S_{21}	S_4	1	100
S_4	S_{10}	S_{20}	1	101



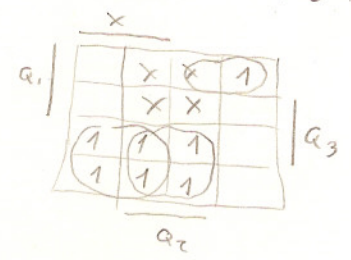
$S_{11}, S_4 = S_{10}, S_{20} \quad X$

Q_n	T	Q_{n+1}	Q_n	Q_{n+1}	T
0	0	0	0	0	0
0	1	1	0	1	1
1	0	1	1	0	1
1	1	0	1	1	0

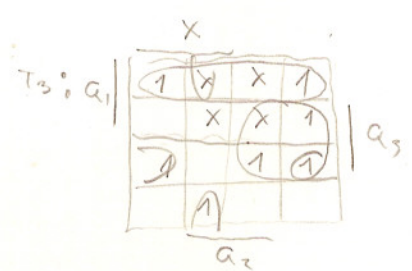
	X	Q_1	Q_2	Q_3	$G_1 Q_2 Q_3$	T_1	T_2	T_3
0	0	0	0	0	000	0	0	0
1	0	0	0	1	000	0	0	1
2	0	0	1	0	100	1	1	0
3	0	0	1	1	100	1	1	1
4	0	1	0	0	011	1	1	1
5	0	1	0	1	000	1	0	1
6	0	1	1	0	x x x	x	x	x
7	0	1	1	1	x x x	x	x	x
8	1	0	0	0	010	0	1	0
9	1	0	0	1	010	0	1	1
10	1	0	1	0	001	0	1	1
11	1	0	1	1	001	0	1	0
12	1	1	0	0	101	0	0	1
13	1	1	0	1	001	1	0	0
14	1	1	1	0	x x x	x	x	x
15	1	1	1	1	x x x	x	x	x



$T_1 = \bar{X} Q_1 + Q_1 Q_3 + \bar{X} Q_2$

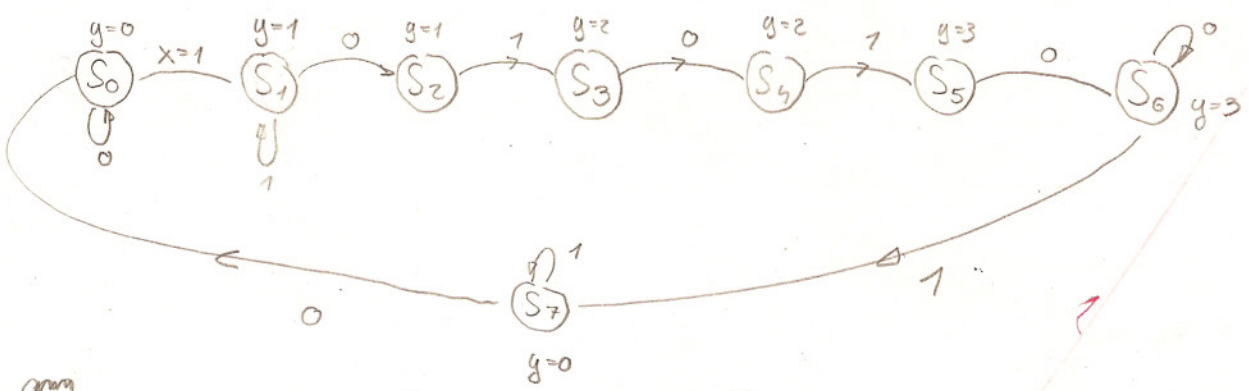


$T_2 = \bar{X} Q_1 \bar{Q}_3 + \bar{Q}_1 Q_2 + X \bar{Q}_1$



$T_3 = Q_1 \bar{Q}_3 + \bar{X} Q_3 + X Q_2 \bar{Q}_3 + \bar{Q}_1 \bar{Q}_2 Q_3$

$m = 4 \quad 0, 1, 2, 3, 0, 1, 2 \dots$



m	m+1		y	
	x=0	x=1	x=0	x=1
S0	S0	S1	0	1
S1	S2	S3	1	1
S2	S2	S3	1	2
S3	S4	S3	2	2
S4	S4	S5	2	3
S5	S6	S5	3	3
S6	S6	S7	3	0
S7	S0	S7	0	0

m	m+1		Z	
	x=0	x=1	x=0	x=1
000	000	001	00	01
001	011	001	01	01
011	011	010	01	11
010	110	010	101	11
110	110	111	101	10
111	101	110	10	10
101	101	100	10	00
100	000	100	00	00

12 14 6 4
13 15 7 5
9 11 3 1
8 10 2 0

	Y1		Y2		Y3		Za		Zb	
	x=0	x=1	x=0	x=1	x=0	x=1	x=0	x=1	x=0	x=1
000	0	0	0	0	0	1	0	0	0	1
001	0	0	1	0	1	1	0	0	1	1
011	0	0	1	1	1	0	0	1	1	1
010	1	0	1	1	0	0	1	1	1	1
110	1	1	1	1	0	1	1	1	1	0
111	1	1	0	1	1	1	1	0	0	0
101	1	1	0	0	1	0	1	0	0	0
100	0	1	0	0	0	0	0	0	0	0

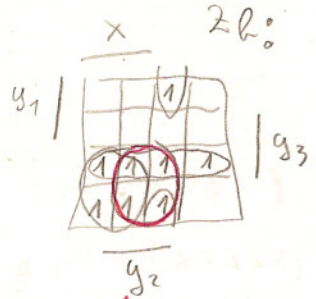
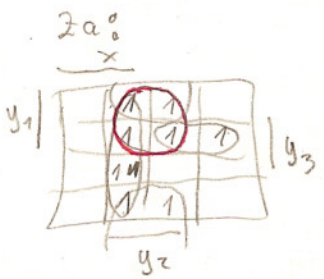
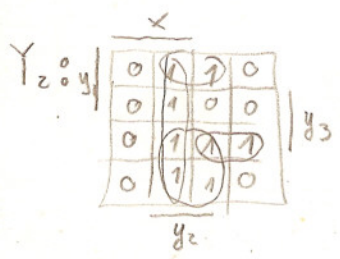
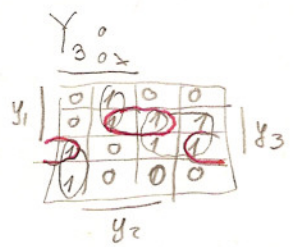
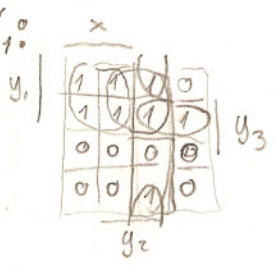
$$Y_1 = x y_1 + y_1 y_2 + y_1 y_3 + \bar{x} \bar{y}_2 y_3$$

$$Y_2 = y_1 y_2 \bar{y}_3 + x y_2 + \bar{y}_1 y_2 + \bar{x} \bar{y}_1 y_3$$

$$Y_3 = x y_1 y_2 + y_1 y_2 y_3 + \bar{x} y_3 + \bar{y}_1 \bar{y}_2 y_3 + \bar{x} \bar{y}_1 \bar{y}_2$$

$$Za = x y_2 + y_1 y_2 + \bar{x} y_1 y_3 + y_2 \bar{y}_3$$

$$Zb = \bar{x} y_2 \bar{y}_3 + y_1 y_3 + x \bar{y}_2 + \bar{y}_1 y_2$$



prepraviše karandani prehod