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TI 206

Varianta
Bilet Nr 17.

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EX 1

Minimizarea FC DN : Minimizarea funcțiilor are ca scop utilizarea in practică a unui număr cât mai mic de tipuri de circuite logice. FC DN poate fi minimizata prin mai multe metode pentru a obține FDM (forma disjunctivă minimă)
Metoda diagramei Karnugh : este folosită pentru a compactiza tabelele de adevăr. Dacă funcția conține n elemente atunci diagrama este un tablou bidimensional cu 2^{p} linii și 2^{q} coloane, $p+q=n$.

EX 2

Formula locală Bernulli

$$p_k = P(\xi = k) = \frac{1}{n+1}, \quad k = 0, 1, 2 \ldots n.$$

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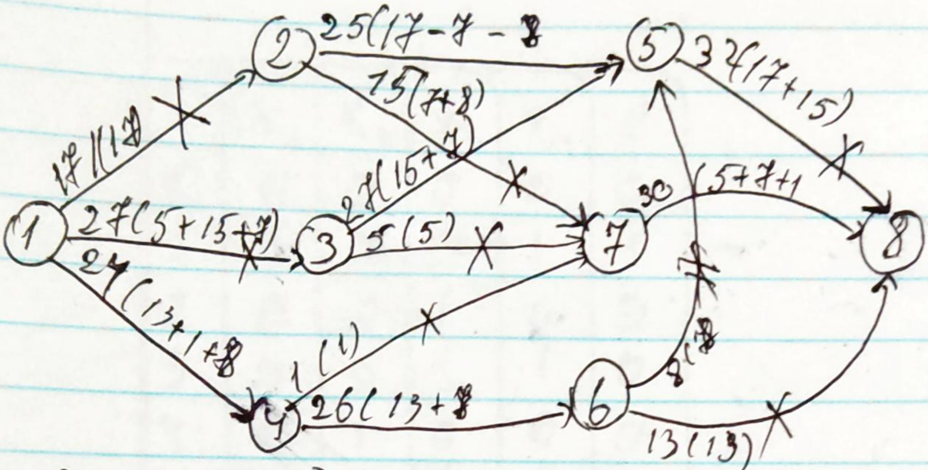
Ex 3 Ford - Fulkerson



$c_1 = \{1, 2, 5, 8\}$ $\varepsilon_1 = \min(17, 25, 32) = 17$

$c_2 = \{1, 3, 7, 8\}$ $\varepsilon_2 = \min(27, 5, 30) = 5$

$c_3 = \{1, 3, 5, 8\}$ $\varepsilon_3 = \min(22, 27, 15) = 15$

$c_4 = \{1, 3, 5, 2, 7, 8\}$ $\varepsilon_4 = \min(7, 12, 17, 15, 25) = 7$

$c_5 = \{1, 4, 6, 8\}$ $\varepsilon_5 = \min(24, 26, 13) = 13$

$c_6 = \{1, 4, 7, 8\}$ $\varepsilon_6 = 1$

$c_7 = \{1, 4, 6, 5, 2, 7, 8\}$

$\varepsilon_7 = \{10, 13, 8, 10, 8, 17\} = 8$

Vârfurile nemarcate

$A = \{2, 3, 5, 7, 8\}$

tăietura de capacitate minimă

$W \setminus A = \{(1,2), (1,3), (4,7), (6,5), (6,8)\}$

Conform teorema ford fulkerson:

$F.\max = C(17 + 27 + 1 + 8 + 13) = 66$

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Ex 4

$f(x_1, x_2, x_3, x_4) = \Sigma(1, 6, 7, 9, 12, 13, 14, 15)$

	x_1	x_2	x_3	x_4	f
0	0	0	0	0	0
1	0	0	0	1	1
2	0	0	1	0	0
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	0
6	0	1	1	0	1
7	0	1	1	1	1
8	1	0	0	0	0
9	1	0	0	1	1
10	1	0	1	0	0
11	1	0	1	1	0
12	1	1	0	0	1
13	1	1	0	1	1
14	1	1	1	0	1
15	1	1	1	1	1

FCDN : $\bar{x}_1 \bar{x}_2 \bar{x}_3 x_4 \vee \bar{x}_1 x_2 x_3 \bar{x}_4 \vee \bar{x}_1 x_2 x_3 x_4 \vee$
$x_1 \bar{x}_2 \bar{x}_3 x_4 \vee x_1 x_2 \bar{x}_3 \bar{x}_4 \vee x_1 x_2 \bar{x}_3 x_4 \vee x_1 x_2 x_3 \bar{x}_4 \vee x_1 x_2 x_3 x_4$

FCCN : $(x_1 \vee x_2 \vee x_3 \vee x_4) \wedge (x_1 \vee x_2 \vee \bar{x}_3 \vee x_4) \wedge (x_1 \vee x_2 \vee \bar{x}_3 \vee \bar{x}_4) \wedge (x_1 \vee \bar{x}_2 \vee x_3 \vee x_4) \wedge$
$(x_1 \vee \bar{x}_2 \vee x_3 \vee \bar{x}_4) \wedge (\bar{x}_1 \vee x_2 \vee x_3 \vee x_4) \wedge (\bar{x}_1 \vee x_2 \vee \bar{x}_3 \vee x_4) \wedge (\bar{x}_1 \vee \bar{x}_2 \vee \bar{x}_3 \vee \bar{x}_4)$

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Minimizarea Quine:

FCDN:

$\bar{x}_1 \bar{x}_2 \bar{x}_3 x_4 +$ $\quad x_1 \bar{x}_2 \bar{x}_3 x_4 +$ $\quad x_1 x_2 x_3 \bar{x}_4 +$

$\bar{x}_1 x_2 x_3 \bar{x}_4 +$ $\quad x_1 x_2 \bar{x}_3 \bar{x}_4 +$ $\quad x_1 x_2 x_3 x_4 +$

$\bar{x}_1 x_2 x_3 x_4 +$ $\quad x_1 x_2 \bar{x}_3 x_4 +$

Alipirea I

① $\bar{x}_1 \bar{x}_2 \bar{x}_3 x_4 \vee x_1 \bar{x}_2 \bar{x}_3 x_4 = \bar{x}_2 \bar{x}_3 x_4$

② $\bar{x}_1 x_2 x_3 \bar{x}_4 \vee \bar{x}_1 x_2 x_3 x_4 = \bar{x}_1 x_2 x_3$

③ $x_1 x_2 \bar{x}_3 \bar{x}_4 \vee x_1 x_2 \bar{x}_3 x_4 = x_1 x_2 \bar{x}_3$ +

④ $x_1 x_2 x_3 \bar{x}_4 \vee x_1 x_2 x_3 x_4 = x_1 x_2 x_3 \cancel{x_4}$. +

Alipirea II

① $\cancel{\bar{x}_2 x_3 x_4 \vee x_1}$

$x_1 x_2 \bar{x}_3 \vee x_1 x_2 x_3 = x_1 x_2$

TCC

implicanți primi		$\bar{x}_1\bar{x}_2\bar{x}_3x_4$	$\bar{x}_1x_2x_3\bar{x}_4$	$\bar{x}_1x_2x_3x_4$	$x_1\bar{x}_2\bar{x}_3x_4$	$x_1x_2\bar{x}_3\bar{x}_4$	$x_1x_2\bar{x}_3x_4$	$x_1x_2x_3\bar{x}_4$	$x_1x_2x_3x_4$
A:	$\bar{x}_2\bar{x}_3x_4$	1	0	0	1	0	0	0	0
B	$\bar{x}_1x_2x_3$	0	1	1	0	0	0	0	0
C	x_1x_2	0	0	0	0	1	1	1	1
		A	B	B	A	C	C	C	C

$$F_{DM} = x_1x_2 \lor \bar{x}_1x_2x_3 \lor \bar{x}_2\bar{x}_3x_4$$

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Metoda Karnaugh:

x_3x_4 \ x_1x_2	00	01	11	10
00	0	0	1	0
01	1	0	1	1
11	0	1	1	0
10	0	1	1	0

$TCD_1 = x_1 x_2$

$TCD_2 = \bar{x}_1 x_2 x_3$

$TCD_3 = \bar{x}_2 \bar{x}_3 x_4$

$$FDM = x_1 x_2 \vee \bar{x}_1 x_2 x_3 \vee \bar{x}_2 \bar{x}_3 x_4$$

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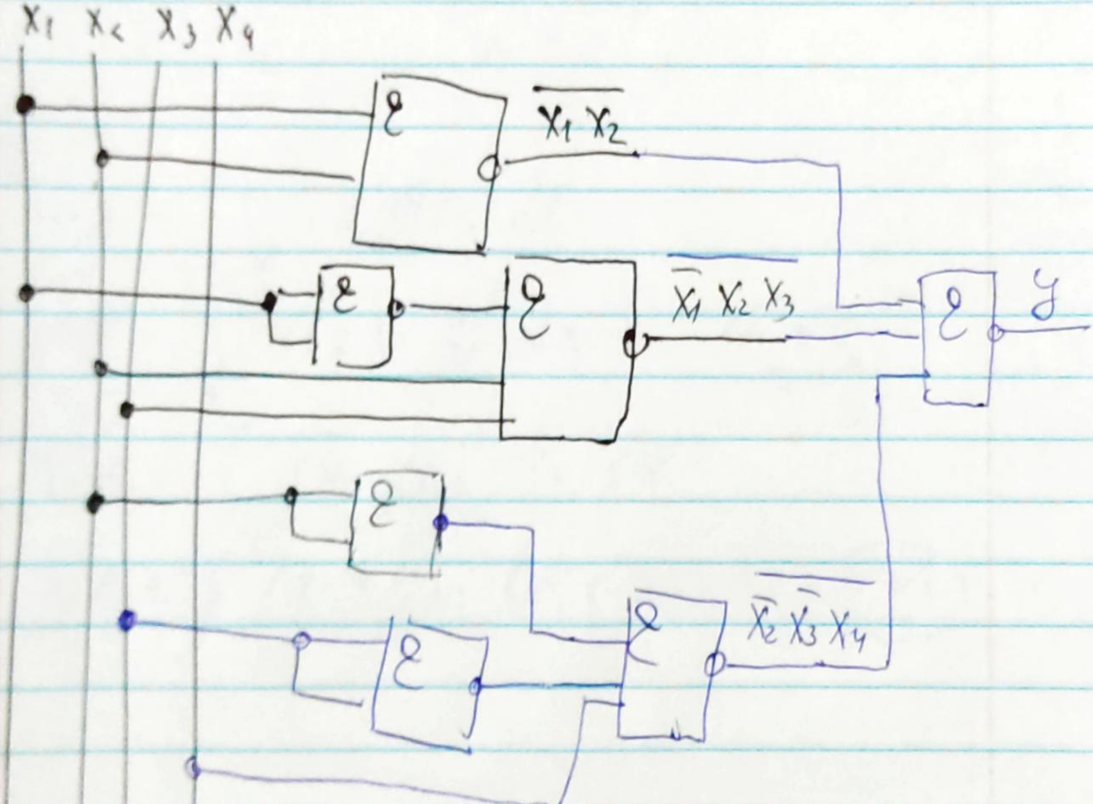
FDM în Baza „Și-nu"

$$y = x_1x_2 \vee \bar{x}_1 x_2 x_3 \vee \bar{x}_2 \bar{x}_3 x_4 =$$

$$= \overline{\overline{x_1 x_2 \vee \bar{x}_1 x_2 x_3 \vee \bar{x}_2 \bar{x}_3 x_4}} =$$

$$= \overline{\overline{x_1 x_2} \cdot \overline{\bar{x}_1 x_2 x_3} \cdot \overline{\bar{x}_2 \bar{x}_3 x_4}}$$



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$\boxed{EX\ 5}$

$$f(x) = \begin{cases} 2(x-3), & x \in [3,4] \\ 0, & x \notin [3,4] \end{cases}$$

1) $F(x) = \int_3^x 2(t-3)\,dt = 8 - 6x + x^2$

$$F x = \begin{cases} 0, & x < 3 \\ 8 - 6x + x^2, & 3 \le x \le 4 \\ 1, & x > 8 \end{cases}$$

2)

$$M\xi = \int_{-\infty}^{\infty} x\, f(x)\, dx$$

$$M\xi = \int_3^4 x(2(x-3))\,dx = 1{,}33$$

$$D\xi = \int_{-\infty}^{\infty} (x - M_\xi)^2 f(x)\, dx$$

$$D\xi = \int_3^4 (x - 1{,}33)^2 (2(x-3))\, dx = 4{,}44$$