9.3.2.7.Simplificaţi următoarele funcţii booleene de patru variabile, date prin formele canonice disjunctive, utilizând diagrame Veitch:

$f7(x_1,x_2,x_3,x_4)=x_1x_2x_3x_4 \lor \bar{x}_1x_2\bar{x}_3x_4 \lor \bar{x}_1x_2x_3x_4 \lor x_1x_2\bar{x}_3\bar{x}_4 \lor x_1\bar{x}_2x_3\bar{x}_4 \lor x_1\bar{x}_2\bar{x}_3\bar{x}_4 \lor x_1\bar{x}_2x_3x_4 \lor \bar{x}_1\bar{x}_2\bar{x}_3x_4 \lor \bar{x}_1\bar{x}_2x_3x_4$

1. Se afla M(f) (multimea monoamelormaximale). Se grupeaza 2 la k, k natural, mintermi adiacenti, k-cat mai mare:

max1 = m1 v m3 v m5 v m7 =

$\bar{x}_1\bar{x}_2\bar{x}_3x_4 \lor \bar{x}_1\bar{x}_2x_3x_4 \lor \bar{x}_1x_2\bar{x}_3x_4 \lor \bar{x}_1x_2x_3x_4$

max2 = m3 v m7 v m11 v m15 =

$\bar{x}_1\bar{x}_2x_3x_4 \lor \bar{x}_1x_2x_3x_4 \lor x_1\bar{x}_2x_3x_4 \lor x_1x_2x_3x_4$

max3 = m8 v m10 =
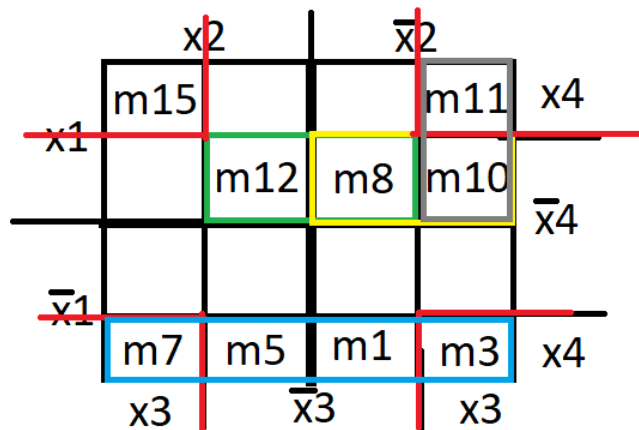
$x_1\bar{x}_2\bar{x}_3\bar{x}_4 \lor x_1\bar{x}_2x_3\bar{x}_4$

max4 = m8 v m12 =

$x1\bar{x}2\bar{x}3\bar{x}4 \lor x1x2\bar{x}3\bar{x}4$

$x1\bar{x}2x3\bar{x}4 \lor x1\bar{x}2x3x4$

2. Se afla C(f) (multimea monoamelor centrale):

max1 =

$\bar{x}1\bar{x}2\bar{x}3x4 \lor \bar{x}1\bar{x}2x3x4 \lor \bar{x}1x2\bar{x}3x4 \lor \bar{x}1x2x3x4$

max2 =

$\bar{x}1\bar{x}2x3x4 \lor \bar{x}1x2x3x4 \lor x1\bar{x}2x3x4 \lor x1x2x3x4$

max3 =

$x1\bar{x}2\bar{x}3\bar{x}4 \lor x1x2\bar{x}3\bar{x}4$

Aflam cazul de simplificare:

M(f) != C(f)

C(f) != multimea vida

=> Intram pe cazul 2 al algoritmului de simplificare:

Functiile simplificate:

g(x1,x2,x3,x4) = max1 v max2 v max3 =

$$\bar{x}1x4 \ \lor \ x3x4 \ \lor \ x1\bar{x}3\bar{x}4$$

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f7(x1,x2,x3,x4)'1 = x̄1x4 v x3x4 v x1x̄3x̄4 v x1x̄2x3
f7(x1,x2,x3,x4)'2 = x̄1x4 v x3x4 v x1x̄3x̄4 v x1x̄2x̄4
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