9.2.17. Verif. dacă se poate obține concl. din ip. prin util. str. input și a clauzei rezolvantă negativă

$$\underbrace{(\exists x)(\forall y)(P(x,y) \rightarrow R(x))}_{U_1},\ \underbrace{(\forall x)(\forall y)\, P(x,y)}_{U_2} \vdash \underbrace{(\exists z)\, R(z)}_{V}$$

Rez. met. rint. prin resp. $\Rightarrow$ se neagă concl.

$$U_1, U_2, \neg V \xrightarrow{P1-7} U_1^c, U_2^c, (\neg V)^c$$

$$S = \{\underbrace{\neg P(x,y) \vee R(x)}_{C_1},\ \underbrace{P(x,y)}_{C_2},\ \underbrace{\neg R(z)}_{C_3}\}$$

$$C_3 = \neg \underline{R(z)} \qquad C_1 = \neg P(x,y) \vee \underline{R(x)}$$

$$[z \leftarrow x]$$

$$C_4 = \neg P(x,y) \qquad C_2 = P(x,y)$$

$$C_5 = \square \overset{}{\underset{T.2}{\Longrightarrow}} \text{are loc deducție}$$

9.2.20 Rez Clocării

2) $U = (\exists y)(\exists x)P(x,y) \longleftrightarrow (\exists x)(\exists y)P(x,y)$

$U_1 = (\exists y)(\exists x)P(x,y) \longrightarrow (\exists x)(\exists y)P(x,y)$

$U_2 = (\exists x)(\exists y)P(x,y) \longrightarrow (\exists y)(\exists x)P(x,y)$

U teoremă $\Leftrightarrow U_1$ teoremă și U_2 teoremă

$(\neg U_2)^c \Rightarrow S = \{\underbrace{P(a,b)}_{C_1}, \underbrace{\neg P(x,y)}_{C_2}\}$

$C_3 = Rez^{a}_{P,[x \leftarrow a, y \leftarrow b]}(C_1, C_2) = \square \overset{TCC}{\Longrightarrow} S$ inconsis $\Rightarrow U_2$ teoremă (1)

$(\neg U_1)^c \Rightarrow S = \{\underbrace{P(d,c)}_{C_4}, \underbrace{\neg P(x,y)}_{C_5}\}$

$C_6 = Rez_{P,[x \leftarrow d, y \leftarrow c]}(C_4, C_5) = \square \overset{TCC}{\Longrightarrow} S$ inconsis

$\Downarrow$

U_1 - teoremă (2)

Din 1, 2 $\Rightarrow U$ teoremă

9.2.21. Util. rez. gen., verif.!

$$\mathcal{U} \stackrel{not.}{=} (\forall x)\,(\exists y)\,\big(P(x,y) \leftrightarrow \neg P(y,y)\big)$$

$$\neg\mathcal{U} \xRightarrow{P_{1-7}} (\neg\mathcal{U})^C \Rightarrow S = \{\underbrace{P(a,y) \vee P(y,y)}_{C_1},\ \underbrace{\neg P(y,y) \vee \neg P(a,y)}_{C_2}\}$$

$C_3 = Fact_{[y \leftarrow a]}(C_1) = P(a,a)$

$C_4 = Fact_{[y \leftarrow a]}(C_2) = \neg P(a,a)$

$C_5 = Rez(C_3, C_4) = \square \xRightarrow{T.C.C} S$ incons. $\xRightarrow{Rez} \mathcal{U}$ - teorema

$Rez_\theta(A \vee l_1, B \vee \neg l_2) \vdash \theta(A \vee B)$

$\theta = mgu(l_1, l_2)$

$Fact_\theta(l_1 \vee l_2 \vee \dots \vee l_k \vee \dots l_n) = \theta(l_k \vee \dots l_n)$

$\theta = mgu(l_1, \dots, l_k)$

FUNCȚII BOOLEENE

9.3.2.2. Simplif. fct. date prin FCD cu diagrame Veitch.

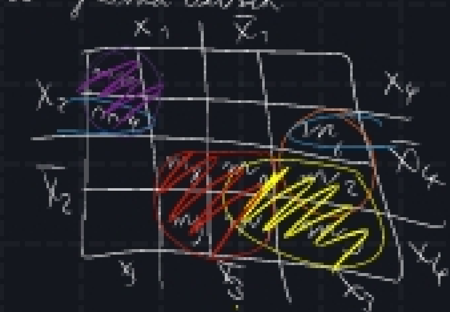
$$f(x_1,x_2,x_3,x_4) = \overset{m_{15}}{x_1 x_2 x_3 x_4} \vee \overset{m_{14}}{x_1 x_2 x_3 \bar{x}_4} \vee \overset{m_6}{\bar{x}_1 x_2 x_3 \bar{x}_4} \vee \overset{m_8}{x_1 \bar{x}_2 \bar{x}_3 \bar{x}_4} \vee \overset{m_0}{\bar{x}_1 \bar{x}_2 \bar{x}_3 \bar{x}_4} \vee$$

$$\vee \overset{m_2}{\bar{x}_1 \bar{x}_2 x_3 \bar{x}_4} \vee \overset{m_9}{x_1 \bar{x}_2 \bar{x}_3 x_4} \vee \overset{m_1}{\bar{x}_1 \bar{x}_2 \bar{x}_3 x_4} \vee \overset{m_3}{\bar{x}_1 \bar{x}_2 x_3 x_4}$$

Obs. $x_1 x_2 x_3 \bar{x}_4 = x_1^1 x_2^1 x_3^1 x_4^0 = m_{14}$

$1110_{(2)} = 14_{(10)}$

Diagrama Veitch



Factorizare – grupăm 2^k mintermi adiacenți, k-max

$max_1 = m_0 \vee m_2 \vee m_1 \vee m_3 = \bar{x}_1 \bar{x}_2$

$max_2 = m_8 \vee m_0 \vee m_9 \vee m_1 = \bar{x}_2 \bar{x}_3$

$max_3 = m_{15} \vee m_{14} = x_1 x_2 x_3$

$max_4 = m_6 \vee m_2 = \bar{x}_1 x_3 \bar{x}_4$

$max_5 = m_{14} \vee m_6 = x_2 \bar{x}_4 x_3$

$M(f) = \{max_1, \dots, max_5\}$

$g = \{max_3, max_2, max_1\}$

$M(f) \neq g \neq \emptyset$

$\Rightarrow$ caz II

$$g(x_1, \dots, x_4) = max_1 \vee max_2 \vee max_3$$

$$h_1(x_1, \dots, x_4) = max_4$$

$$h_2(x_1, \dots, x_4) = max_5$$

$$f_1^S(x_1, \dots, x_4) = g(x_1, \dots, x_4) \vee h_1(x_1, \dots, x_4) =$$

$$= max_1 \vee max_2 \vee max_3 \vee max_4 = \bar{x}_1 \bar{x}_2 \vee \bar{x}_2 \bar{x}_3 \vee x_1 x_2 x_3 \vee \bar{x}_1 x_3 \bar{x}_4$$

$$f_2^S(x_1, \dots, x_4) = g(x_1, \dots, x_4) \vee h_2(x_1, \dots, x_4) =$$

$$= \bar{x}_1 \bar{x}_2 \vee \bar{x}_2 \bar{x}_3 \vee \bar{x}_1 \bar{x}_2 \bar{x}_3 \vee x_2 \bar{x}_4 x_3$$