Изпълнимост

$\varphi_1 \leftrightharpoons \forall x \forall y \forall z\, ((p(x,y) \vee p(y,x)) \,\&\, ((p(x,y) \,\&\, p(y,z)) \Rightarrow p(x,z)))$

Γ_1 $\varphi_2 \leftrightharpoons \forall x \forall y\, (r(x,y) \Leftrightarrow (p(x,y) \,\&\, \neg p(y,x))) \,\&\, r(a,b)$

$\varphi_3 \leftrightharpoons \forall x \exists y\, (\neg r(x,y) \vee r(y,x)) \,\&\, r(x, f(y)))$ $\quad 0 \; 1$

$\neg r(x,y) \,\&\, \neg r(y,x)$

$\Gamma_2 = \Gamma_1 \cup \{\forall x \exists y (\neg(r(x,y) \vee r(y,x)) \,\&\, \neg r(x, f(y)))\}$

$\Gamma_3 = \Gamma_2 \cup \{\varphi_4 \leftrightharpoons \forall x\, p(a,x)\}$ $\neg r(x,y) \,\&\, \neg r(y,x)$

Да се знае кои от м-вата са изп.?

φ_1 – линейност и транзитивност на релацията p^A

$\forall x(\varphi \,\&\, \psi) \vDash \forall x \varphi \,\&\, \forall x \psi$ $\quad$ p^A е ~~рефл~~ рефлексивна

φ_2 – r^A е строгият вариант на p^A

$\langle a^A, b^A \rangle \in r^A \rightarrow a^A \neq b^A$ и следо $r^A \neq \emptyset$

φ_3 – за всяко x има y, с което е несравнимо по p^A, но $\langle x, f^A(y) \rangle$ вече са в r^A

$\mathcal{A} = \langle \mathbb{N}; r, p; a, b, f \rangle$

$a^{\mathcal{A}} \leftrightharpoons 0, \quad b^{\mathcal{A}} \leftrightharpoons 1$

$r^{\mathcal{A}} \leftrightharpoons \leq_{\mathbb{N}}$

$p^{\mathcal{A}} \leftrightharpoons =_{\mathbb{N}}$

$f^{\mathcal{A}}(x) \leftrightharpoons x+1, \quad x \in \mathbb{N}$ $\qquad x \leq f^{\mathcal{A}}(y)$

$y = x$

$\langle x, x \rangle \notin r^{\mathcal{A}}$

φ_4 – за всяко x има y, т.ч. $\langle x, y \rangle, \langle y, x \rangle \notin r^{\mathcal{A}}$

$\langle x, f^{\mathcal{A}}(y) \rangle \notin r^{\mathcal{A}}$

$r(x, y) \Leftrightarrow p(x, y) \,\&\, \neg p(y, x)$

$\mathbb{N}$

$$f^{\mathcal{B}}(x) = \begin{cases} n+1, & x \text{ clone } x = n' \\ n', & x \text{ original}, x = n \end{cases}$$

$\forall x \exists y$ a) $x < f(y)$

b) $x \not< f(y)$

$\longrightarrow p$

$- - \to r$

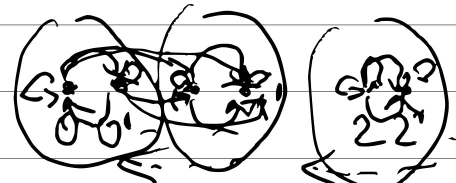
$x \in \mathbb{N}$: a) x' [illegible]

b) x [illegible]

$x' \in \mathbb{N}'$: a) x' [illegible]

b) x y [illegible]

$\mathcal{B} = \langle \mathbb{N} \cup \mathbb{N}',$



$< r$

$a^{\mathcal{B}} \leq 0, \; b^{\mathcal{B}} \leq 1$

Γ_3:

$\forall x \, p(a, x)$

0

Prolog

L - списък от списъци
с T(L) озн. мн-во от всички списъци,
които могат да се предст. като конкатенация на
пермутации на елементи от L.
p(L, X) - по дадено L проверява дали X ∈ T(L)

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p(L, X) :- subsequence(L, S), permutation(S, P),
        megaAppend(P, X).

subsequence([], []).
subsequence([H|T], [H|R]) :- subse...(T, R).
subsequence([_|T], R) :- subsequence(T, R).
megaAppend([], []).
megaAppend([H|T], R) :- megaAppend(T, R1),
                        append(H, R1, R).
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Без др. р. P

$A = \langle \mathbb{N}, P^A \rangle$: $P^A(a,b,c) \Leftrightarrow \underline{a - b = c^2}$

Всеки синг. е опр.

$= \Leftarrow a \geq b$

$\underline{a^4}$

Вярно ли е, че всяко подмн-во на ест. числа е опр.

$\underline{\underline{\mathcal{P}}}$

$\mathcal{P}(\mathbb{N}) = \overline{\overline{\mathbb{R}}}$

$h(\{n\}) = \{n\} \rightarrow h(n) = n$

$\{0\}$ $p(x,x,x)$

$x = x^2$

$\{1\}$ $\exists y(\varphi_0(y) \,\&\, p(x,y,x) \,\&\, \underbrace{\neg\varphi_0(x)})$

$+1$ $\exists z(\varphi_1(z) \,\&\, p(x,y,z))$

$\{n\}$ По индукция

$a > b$

$\varphi_{*2}(\quad a = b^2 \quad \exists y(\varphi_0(y) \,\&\, p(x, y, z))$

$\Rightarrow a^2 > b^2$

$a_1 = a^2 - c = b^2 \qquad a_1 - c = b^2 \quad p(a_1, c, b)$

$\exists a_1 (\varphi_{*2}(a, a_1) \,\&\, p(a_1, c, b))$

$\& \neg \varphi_0(c))$

$a = b^4 = (b^2)^2 = (b_1)^2$

$\varphi_{*4} \quad \exists b_1 (\varphi_{*2}(b, b_1) \,\&\, \varphi_{*2}(b_1, a))$

$\mathbb{Z}, \mathbb{N}, r$

$\langle a, b \rangle \in r^* \Leftrightarrow a = b + 4$

$\langle a, b \rangle \in p^* \Leftrightarrow a = 7b$

$\{0\} \quad p(x, x)$

$7 \cdot 7 \cdot x = 48 + x$

$49x = 48 + x$

$x = 1$

$+4$

$49 \cdot 2 = 48 \cdot 2 + 2$

$49 \cdot 3 = \underline{48 \cdot 3} + 3$

$\varphi(\underbrace{7 \cdot 7 \cdot x}_{x_1})($ $\varphi_{49}(x,y) \leftrightharpoons \exists x_1 (p(x,x_1) \wedge p(x_1,y)))$

$q = r$

$\varphi((48+x)(x,y)) \exists y_1 \ldots y_n (q(x,y_1) \wedge q(y_1,y_2) \ldots q(y_n,y)))$

$\exists y (\varphi_{48+x}(x,y) \wedge \varphi_{49}(x,y))$