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$$\{ \{ \text{Nat}(s(x)), \neg \text{Nat}(x) \}, \{ \text{Nat}(1) \} \} \models \{ \text{Nat}(s(1)) \}$$

$$\{ \{ \text{Nat}(s(1)), \neg \text{Nat}(1) \}, \{ \text{Nat}(1) \} \} \models \{ \text{Nat}(s(1)) \}$$

$$\{ \{ \text{Nat}(s(x)), \neg \text{Nat}(x) \}, \{ \text{Nat}(1) \} \} \not\models \{ \text{Nat}(s(1)) \}$$

$$\not\models \{ p(x) \} \models \{ p(\text{false}) \}$$

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$$s_1 = \{ \frac{z}{g(x,y)}, \frac{v}{w} \} \quad s_2 = \{ \frac{x}{a}, \frac{y}{b}, \frac{w}{c}, \frac{z}{d} \}$$

$$p(x, y, z, v) s_1 s_2 =$$

$$[p(x, y, g(x, y), w)] s_2 =$$

$$p(a, b, g(a, b), c)$$

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$$\underbrace{g(w)}_{=} \quad \underbrace{g(f(z))}_{\neq} \quad \bigg| \quad \underbrace{g(w)}_{=} \quad \underbrace{g(f(z))}_{\neq} \quad \underbrace{f(x)}_{\neq}$$

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$$T_0 = \{ P(x, f(y), y), P(z, f(b), b) \}$$

$$D_0 = \{ x, z \}$$

$$S_1 := \{ \frac{x}{z} \}$$

$$T_1 = \{ P(z, f(y), y), P(z, f(b), b) \}$$

$$D_1 = \{ y, b \}$$

$$S_2 := S_1 \cup \{ \frac{y}{b} \} = \{ \frac{x}{z}, \frac{y}{b} \}$$

$$T_2 = \{ P(z, f(b), b) \}$$

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$$T_0 = \{ \text{knows}(\text{John}, x), \text{knows}(x, \text{Elizabeth}) \}$$

$$D_1 = \{ \text{John}, x \}$$

$$S_1 := \{ \frac{x}{\text{John}} \}$$

$$T_1 = \{ \text{knows}(\text{John}, \text{John}), \text{knows}(\text{John}, \text{Elizabeth}) \}$$

$$D_2 = \{ \text{John}, \text{Elizabeth} \}$$

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$$\begin{array}{c}
 \{Nat(s(x)), \neg Nat(x)\} \quad \{Nat(1)\} \\
 \hline
 \{Nat(s(x))\}g \\
 || \\
 \{Nat(s(1))\}
 \end{array}
 \rightarrow
 \underbrace{\{ \frac{x}{1} \}}_{=g}$$

$\{Nat(x), Nat(1)\}$
 $MGO = \{ \frac{x}{1} \}$

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Full

$$\begin{array}{c}
 \{P(x_1, x_2), P(x_2, x_1)\} \quad \{\neg P(y_1, y_2), \neg P(y_2, y_1)\} \\
 \hline
 \{ \frac{x_1}{x_1}, \frac{y_1}{x_1}, \frac{y_2}{x_1} \}
 \end{array}$$

□

$$\begin{array}{c}
 \{P(x_1, x_2), P(x_2, x_1), P(y_1, y_2), P(y_2, y_1)\} \quad \{ \frac{x_2}{x_1}, \frac{y_1}{x_1}, \frac{y_2}{x_1} \} \\
 || \\
 \{P(x_1, x_1)\}
 \end{array}$$

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Fact

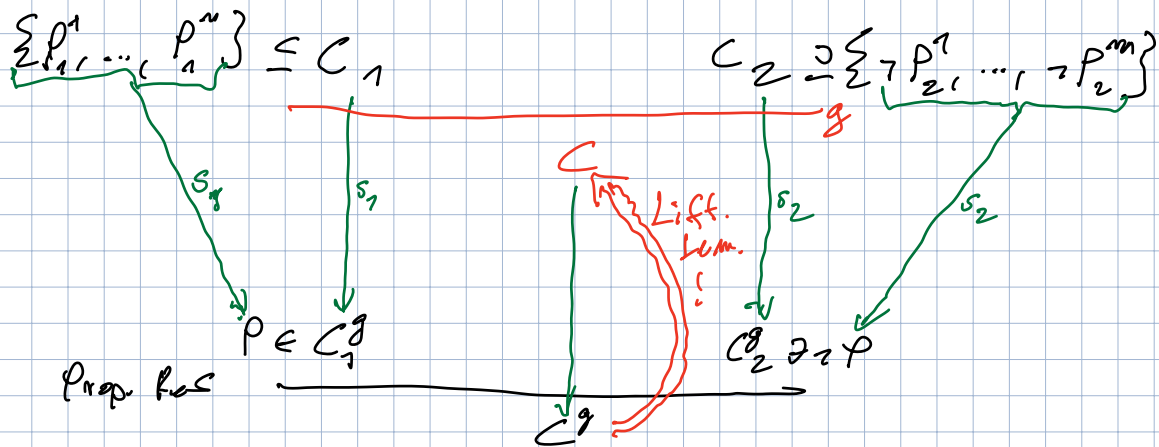
$$\begin{array}{c}
 \{P(x_1, x_2), P(x_2, x_1)\} \quad \{\neg P(y_1, y_2), \neg P(y_2, y_1)\} \\
 \hline
 \{P(x_1, x_1)\} \quad \{ \frac{x_2}{x_1} \} \quad \text{Fact} \quad \{ \neg P(y_1, y_1) \} \quad \{ \frac{y_2}{y_1} \}
 \end{array}$$

Binary

$$\{ \frac{y_2}{x_1} \}$$

□

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$\Rightarrow s_1 s_2$ unifies $\{p_1^1, \dots, p_1^n, p_2^1, \dots, p_2^m\}$

\Rightarrow ex. M&V 8, can apply Full PC1 Resolution!