Problem psi

$$R_0, X \vdash_{\mathrm{ipl}} \tilde{g}\,?$$

Not Proved

Clauses in R_0: 24

Clauses in X: 9

Atoms: 22

Calls to the SAT-solver: 14

Restarts: 4

Worlds in the countermodel: 3

R_0 and X are defined at the end of the document

Start

(0) $R_0 \vdash_{\mathrm{c}} \tilde{g}\,?$

No($\emptyset$)

New world: w_0

W		λ s.t. $w \not\vdash_W \lambda$
w_0	$\emptyset$	$\lambda_0,\ \lambda_1,\ \lambda_2,\ \lambda_3,\ \lambda_4,\ \lambda_5,\ \lambda_6,\ \lambda_7,\ \lambda_8$

Selected: $\langle w_0,\ \lambda_0 = (p_4 \to p_3) \to \tilde{p}_{11}\rangle$

(1) $R_0,\ w_0,\ p_4 \vdash_{\mathrm{c}} p_3\,?$

No($\{\,\tilde{p}_{10},\ \tilde{p}_{14},\ p_4\,\}$)

New world: w_1

W		λ s.t. $w \not\vdash_W \lambda$
w_1	$\tilde{p}_{10},\ \tilde{p}_{14},\ p_4$	$\lambda_3,\ \lambda_4,\ \lambda_5,\ \lambda_7,\ \lambda_8$
w_0	$\emptyset$	$\lambda_2,\ \lambda_3,\ \lambda_4,\ \lambda_5,\ \lambda_6,\ \lambda_7,\ \lambda_8$

Selected: $\langle w_1,\ \lambda_3 = (p_3 \to p_2) \to \tilde{p}_8\rangle$

(2) $R_0,\ w_1,\ p_3 \vdash_{\mathrm{c}} p_2\,?$

Yes($\{\,\tilde{p}_{10},\ p_3\,\}$)

$R_0,\ \tilde{p}_{10},\ p_3 \vdash_{\mathrm{c}} p_2$

New clause: $\varphi_0 = \tilde{p}_{10} \to \tilde{p}_8$

$R_1 = R_0, \varphi_0$

Restart 1

(3) $R_1 \vdash_c \tilde{g}$?
No({ $\tilde{p}_{11}, \tilde{p}_{14}, \tilde{p}_7, p_3$ })
New world: w_2

W		λ s.t. $w \nVdash_W \lambda$
w_2	$\tilde{p}_{11}, \tilde{p}_{14}, \tilde{p}_7, p_3$	$\lambda_1, \lambda_5, \lambda_7, \lambda_8$

Selected: $\langle w_2, \lambda_1 = (p_4 \to p_1) \to \tilde{p}_{13} \rangle$

(4) $R_1, w_2, p_4 \vdash_c p_1$?
Yes({ $\tilde{p}_{11}, p_4$ })
$R_1, \tilde{p}_{11}, p_4 \vdash_c p_1$
New clause: $\varphi_1 = \tilde{p}_{11} \to \tilde{p}_{13}$
$R_2 = R_1, \varphi_1$

Restart 2

(5) $R_2 \vdash_c \tilde{g}$?
No({ $\tilde{p}_{10}, \tilde{p}_{14}, \tilde{p}_8, p_4$ })
New world: w_3

W		λ s.t. $w \nVdash_W \lambda$
w_3	$\tilde{p}_{10}, \tilde{p}_{14}, \tilde{p}_8, p_4$	$\lambda_4, \lambda_5, \lambda_7, \lambda_8$

Selected: $\langle w_3, \lambda_4 = (p_2 \to p_3) \to \tilde{p}_7 \rangle$

(6) $R_2, w_3, p_2 \vdash_c p_3$?
No({ $\tilde{p}_1, \tilde{p}_{10}, \tilde{p}_{14}, \tilde{p}_8, p_2, p_4$ })
New world: w_4

W		λ s.t. $w \nVdash_W \lambda$
w_4	$\tilde{p}_1, \tilde{p}_{10}, \tilde{p}_{14}, \tilde{p}_8, p_2, p_4$	λ_8
w_3	$\tilde{p}_{10}, \tilde{p}_{14}, \tilde{p}_8, p_4$	λ_7, λ_8

Selected: $\langle w_4, \lambda_8 = (p_0 \to \bot) \to \tilde{g} \rangle$

(7) $R_2, w_4, p_0 \vdash_c \bot$?
No({ $\tilde{g}, \tilde{p}_1, \tilde{p}_{10}, \tilde{p}_{14}, \tilde{p}_8, p_0, p_2, p_4$ })
New world: w_5

W		λ s.t. $w \not\Vdash_W \lambda$
w_5	$\tilde{g}, \tilde{p}_1, \tilde{p}_{10}, \tilde{p}_{14}, \tilde{p}_8, p_0, p_2, p_4$	$\emptyset$
w_4	$\tilde{p}_1, \tilde{p}_{10}, \tilde{p}_{14}, \tilde{p}_8, p_2, p_4$	$\emptyset$
w_3	$\tilde{p}_{10}, \tilde{p}_{14}, \tilde{p}_8, p_4$	λ_7

Selected: $\langle w_3, \lambda_7 = (p_1 \to p_2) \to \tilde{p}_1 \rangle$

(8) $R_2, w_3, p_1 \vdash_c p_2$?

Yes($\{\tilde{p}_{14}, p_1\}$)

$R_2, \tilde{p}_{14}, p_1 \vdash_c p_2$

New clause: $\varphi_2 = \tilde{p}_{14} \to \tilde{p}_1$

$R_3 = R_2, \varphi_2$

Restart 3

(9) $R_3 \vdash_c \tilde{g}$?

No($\{\tilde{p}_{10}, \tilde{p}_{13}, \tilde{p}_2, \tilde{p}_8, p_1\}$)

New world: w_6

W		λ s.t. $w \not\Vdash_W \lambda$
w_6	$\tilde{p}_{10}, \tilde{p}_{13}, \tilde{p}_2, \tilde{p}_8, p_1$	$\lambda_0, \lambda_4, \lambda_8$

Selected: $\langle w_6, \lambda_0 = (p_4 \to p_3) \to \tilde{p}_{11} \rangle$

(10) $R_3, w_6, p_4 \vdash_c p_3$?

Yes($\{\tilde{p}_{13}, p_4\}$)

$R_3, \tilde{p}_{13}, p_4 \vdash_c p_3$

New clause: $\varphi_3 = \tilde{p}_{13} \to \tilde{p}_{11}$

$R_4 = R_3, \varphi_3$

Restart 4

(11) $R_4 \vdash_c \tilde{g}$?

No($\{\tilde{p}_1, \tilde{p}_{10}, \tilde{p}_{14}, \tilde{p}_8, p_4\}$)

New world: w_7

W		λ s.t. $w \not\Vdash_W \lambda$
w_7	$\tilde{p}_1, \tilde{p}_{10}, \tilde{p}_{14}, \tilde{p}_8, p_4$	$\lambda_4, \lambda_5, \lambda_8$

Selected: $\langle w_7,\ \lambda_4\ =\ (p_2 \to p_3) \to \tilde{p}_7 \rangle$

(12) $R_4,\ w_7,\ p_2 \vdash_{\mathrm{c}} p_3$?

No($\{\, \tilde{p}_1,\ \tilde{p}_{10},\ \tilde{p}_{14},\ \tilde{p}_8,\ p_2,\ p_4 \,\}$)

New world: w_8

W		λ s.t. $w \not\vdash_W \lambda$
w_8	$\tilde{p}_1,\ \tilde{p}_{10},\ \tilde{p}_{14},\ \tilde{p}_8,\ p_2,\ p_4$	λ_8
w_7	$\tilde{p}_1,\ \tilde{p}_{10},\ \tilde{p}_{14},\ \tilde{p}_8,\ p_4$	λ_8

Selected: $\langle w_8,\ \lambda_8\ =\ (p_0 \to \bot) \to \tilde{g} \rangle$

(13) $R_4,\ w_8,\ p_0 \vdash_{\mathrm{c}} \bot$?

No($\{\, \tilde{g},\ \tilde{p}_1,\ \tilde{p}_{10},\ \tilde{p}_{14},\ \tilde{p}_8,\ p_0,\ p_2,\ p_4 \,\}$)

New world: w_9

W		λ s.t. $w \not\vdash_W \lambda$
w_9	$\tilde{g},\ \tilde{p}_1,\ \tilde{p}_{10},\ \tilde{p}_{14},\ \tilde{p}_8,\ p_0,\ p_2,\ p_4$	$\emptyset$
w_8	$\tilde{p}_1,\ \tilde{p}_{10},\ \tilde{p}_{14},\ \tilde{p}_8,\ p_2,\ p_4$	$\emptyset$
w_7	$\tilde{p}_1,\ \tilde{p}_{10},\ \tilde{p}_{14},\ \tilde{p}_8,\ p_4$	$\emptyset$

Countermodel found

Problem description

Flat clauses R_0 (24):

1. $\tilde{p}_1 \wedge \tilde{p}_2 \to \tilde{p}_0$

2. $\tilde{p}_3 \to p_3$

3. $\tilde{p}_3 \to p_4$

4. $\tilde{p}_4 \to p_2$

5. $\tilde{p}_4 \to \tilde{p}_3$

6. $\tilde{p}_5 \to p_1$

7. $\tilde{p}_5 \to \tilde{p}_4$

8. $\tilde{p}_0 \to \tilde{p}_5$

9. $\tilde{p}_7 \wedge \tilde{p}_8 \to \tilde{p}_6$

10. $\tilde{p}_6 \to \tilde{p}_5$

11. $\tilde{p}_{10} \land \tilde{p}_{11} \to \tilde{p}_9$

12. $\tilde{p}_9 \to \tilde{p}_5$

13. $\tilde{p}_{13} \land \tilde{p}_{14} \to \tilde{p}_{12}$

14. $\tilde{p}_{12} \to \tilde{p}_5$

15. $p_0 \to \tilde{g}$

16. $p_1 \land p_2 \land p_3 \land p_4 \to \tilde{g}$

17. $p_3 \to \tilde{p}_{11}$

18. $p_1 \to \tilde{p}_{13}$

19. $p_4 \to \tilde{p}_{10}$

20. $p_2 \to \tilde{p}_8$

21. $p_3 \to \tilde{p}_7$

22. $p_1 \to \tilde{p}_2$

23. $p_4 \to \tilde{p}_{14}$

24. $p_2 \to \tilde{p}_1$

Implication clauses X (9):

$\lambda_0 = (p_4 \to p_3) \to \tilde{p}_{11}$

$\lambda_1 = (p_4 \to p_1) \to \tilde{p}_{13}$

$\lambda_2 = (p_3 \to p_4) \to \tilde{p}_{10}$

$\lambda_3 = (p_3 \to p_2) \to \tilde{p}_8$

$\lambda_4 = (p_2 \to p_3) \to \tilde{p}_7$

$\lambda_5 = (p_2 \to p_1) \to \tilde{p}_2$

$\lambda_6 = (p_1 \to p_4) \to \tilde{p}_{14}$

$\lambda_7 = (p_1 \to p_2) \to \tilde{p}_1$

$\lambda_8 = (p_0 \to \bot) \to \tilde{g}$

Added clauses (4):

$\varphi_0 = \tilde{p}_{10} \to \tilde{p}_8$

$\varphi_1 = \tilde{p}_{11} \to \tilde{p}_{13}$

$\varphi_2 = \tilde{p}_{14} \to \tilde{p}_1$

$\varphi_3 = \tilde{p}_{13} \to \tilde{p}_{11}$