HW5 Qiaowei Li qxl161930

¬Goal

$\neg(\exists x \exists y\ N(x) \wedge F(x) \wedge D(y) \wedge L(y) \wedge IMT(x,y) \Rightarrow PTBK(y,x))$

1. $\exists x \exists y\ L(y) \wedge G(y) \wedge N(x) \wedge IMT(x,y) \wedge W(x) \Rightarrow PTBK(y,x$

2. $\exists x \exists y\ man(x) \wedge woman(y) \wedge IMT(x,y) \wedge (T(x) \Rightarrow W(x)) \wedge (D(y) \Rightarrow T(x))$

3. $\exists x \exists y\ man(x) \wedge woman(y) \wedge (F(y) \Rightarrow G(x))$

4. $\forall x\ Lady(x) \Rightarrow woman(x)$

5

CNF.

$\neg G$: $\forall x \forall y \; N(x) \wedge F(x) \wedge D(y) \wedge L(y) \wedge IMT(x,y) \wedge \neg PTBK(y,x)$

$\neg G$:

$N(x)$

$F(x)$

$D(y)$

$L(y)$

$IMT(x,y)$

$\neg PTBK(y,x)$

$\forall x \exists y \left(\neg L(y) \wedge G(y) \wedge N(x) \wedge IMT(x,y) \wedge W(x)\right) \vee PTBK(y,x)$

$\forall x \exists y \; \neg L(y) \vee \neg G(y) \vee \neg N(x) \vee \neg IMT(x,y) \vee \neg W(x) \vee PTBK(y,x)$

$\neg L(b) \vee \neg G(b) \vee \neg N(a) \vee \neg IMT(a,b) \vee \neg W(a) \vee PTBK(b,a)$

2. $\exists x \exists y \; man(x) \wedge woman(y) \wedge IMT(x,y) \wedge (\neg T(x) \vee W(x)) \wedge (\neg D(y) \vee T(x))$

$man(c) \wedge woman(d) \wedge IMT(c,d) \wedge (\neg T(c) \vee W(c)) \wedge (\neg D(d) \vee T(c))$

$man(c)$

$woman(d)$

$IMT(c,d)$

$\neg T(c) \vee W(c)$

$\neg D(d) \vee T(c)$

3. $\exists x \exists y \; man(x) \wedge woman(y) \wedge (\neg F(y) \vee G(x))$

$man(e) \wedge woman(f) \wedge (\neg F(f) \vee G(e))$

$man(e)$

$woman(f)$

$\neg F(f) \vee G(e)$

4. $\neg L(x) \vee Woman(x)$, we have $L(x)$ $\Rightarrow$ $woman(x)$

From 1. and $\neg G$:

$\neg G(b) \vee \neg W(a)$ —— a

From 2 and $\neg G$

$W(c) \vee \neg D(d)$, $D(y)$ $\xrightarrow{y/d}$ $W(c)$ —— b

From 3 and $\neg G$

$\neg F(f) \vee G(e)$, $F(x)$ $\xrightarrow{x/f}$ $G(e)$ —— c

From a. b, c.

we have when sub[b/e, a/c], the result $\begin{cases} \neg G(e) \vee \neg W(c) \\ W(c) \\ G(e) \end{cases}$ is contradictory. we can have the conclusion the lady persuade the noble ~~to~~ want ~~to~~ be king.

otherwise the lady may not persuade the noble ~~to~~ want ~~to~~ be the king.