

EXAM 15.01.18

$$\forall x \forall y (\text{pack}(x) \wedge \text{pack}(y) \wedge \text{At}(x, R1) \wedge \text{At}(y, R2)) \Rightarrow \text{Smaller}(x, y)$$

$$\text{pack}(A) \wedge \text{pack}(B)$$

$$\text{At}(A, R1) \vee \text{At}(A, R2)$$

$$\text{At}(B, R1)$$

$$\neg \text{Smaller}(B, A)$$

They are all in clausal form except the first one:

$$\neg \text{pack}(x) \vee \neg \text{pack}(y) \vee \neg \text{At}(x, R1) \vee \neg \text{At}(y, R2) \vee \text{Smaller}(x, y)$$

$$KB = \{ \neg \text{pack}(x), \neg \text{pack}(y), \neg \text{At}(x, R1), \neg \text{At}(y, R2), \text{Smaller}(x, y) \}_{1,2,3,4,5}$$

$$\{ \text{pack}(B) \}_{6}, \{ \text{At}(A, R1), \text{At}(A, R2) \}_{7,8}, \{ \text{At}(B, R1) \}_{9}, \{ \neg \text{Smaller}(B, A) \}_{10}$$

Is not horn because the formula n. 5 is not horn!

I have to negate the thesis: $\neg \text{At}(A, R1)$

$$1 \text{ and } 3 \Rightarrow \{ \neg \text{pack}(y), \neg \text{At}(B, R1), \neg \text{At}(y, R2), \text{Smaller}(B, y) \}_{13}$$

$$2 \text{ and } 8 \Rightarrow \{ \neg \text{At}(B, R1), \neg \text{At}(A, R2), \text{Smaller}(B, A) \}_{9}$$

$$4 \text{ and } 9 \Rightarrow \{ \neg \text{At}(B, R1), \text{At}(A, R1), \text{Smaller}(B, A) \}_{10}$$

$$5 \text{ and } 10 \Rightarrow \{ \text{At}(A, R1), \text{Smaller}(B, A) \}_{11}$$

$$6 \text{ and } 11 \Rightarrow \{ \text{At}(A, R1) \}_{12}$$

$$7 \text{ and } 12 \Rightarrow \{ \}$$

$$P(x, F(x)) \wedge Q(F(x), x)$$

Correct.

$$p(x_1, f(x_1)) \stackrel{?}{=} p(g(x_2), f(g(a))) \quad x_1 = g(x_2) \quad f(x_1) = f(g(a))$$

$$x_1 = g(a) \quad g(a) = g(x_2) \rightarrow a = x_2 \Rightarrow x_1 / g(a) \text{ and } x_2 / a$$

$$S(x, [x/x_5]) \stackrel{?}{=} S(y, [a, b, c]) \quad x = y \quad x = a \quad x_5 = [b, c]$$

$$x/y \quad x_5/[b, c]$$