Inference in First-order Logic

1 Problem 1

Russell and Norvig, Exercise 9.18.
From "Horses are animals," it follows that "The head of a horse is the head of an animal." Demonstrate that this inference is valid by carrying out the following steps:

a. Translate the premise and the conclusion into the language of first-order logic. Use three predicates: $HeadOf(h, x)$(meaning "h is the head of x"), $Horse(x)$, and $Animal(x)$.

b. Negate the conclusion, and convert the premise and the negated conclusion into conjunctive normal form.

c. Use resolution to show that the conclusion follows from the premise.

2 Problem 2

Use first-order refutation resolution to prove the following theorem:

Knowledge Base: For every married couple, there is some habit of the husband's that the wife does not like. Thomas is Kristina's husband.

Theorem: Kristina does not like all of Thomas's habits