INF5390 oblig 2

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Task 1

Domain:

Constants:

The domain does not have any known constants.

Functions:

The domain has the following functions:
CanFool(X, Y) - Returns the times when X can fool Y

Relations:

The domain has the following relations:

- Man(X) - (X) exists if X is a man
- Woman(X) - (X) exists if X is a woman
- Vegetarian(X) - (X) exists if X is a vegetarian
- Smart(X) - (X) exists if X is smart
- Politician(X) - (X) exists if X is a politician
- Barber(X) - (X) exists if X is a barber
- Hate(X, Y) - (X, Y) exists if X hate Y
- Like(X, Y) - (X, Y) exists if X like Y
- Shaves(X, Y) - (X, Y) exists if X shaves Y

All relations has a fixed arity, but we use the paranthesis to define arguments as it is easier to read.

a.

$\forall X \forall Y((Vegetarian(Y) \wedge Hates(X,Y)) \rightarrow Smart(X)$

b.

$\forall X(Smart(X) \wedge Vegetarian(X) \rightarrow (\forall Y(\neg Like(Y,X)))$

c.

$\exists X(Woman(X) \wedge \forall Y((Man(Y) \wedge vegetarian(Y)) \rightarrow like(X,Y))$

d.

$\exists X(barber(X) \wedge \forall Y(Man(Y) \wedge \neg Shaves(Y,Y) \rightarrow Shaves(X,Y)))$

e.

$\forall X(Politican(X) \rightarrow (\exists Y \forall T(T \in CanFool(X,Y)) \vee \forall Y \exists T(T \in CanFool(X,Y)) \wedge \exists Y \exists T(T \notin CanFool(X,Y))))$