INF5390 oblig 2

mathiajj and martinvl

April 2, 2014

Task 1

Domain:

Constants:

The domain does not have any known constants.

Functions:

The domain has the following functions:

- canfool(X, Y) - Returns the set of 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 and functions 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.

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

c.

$\exists X \forall Y ((Woman(X) \wedge (Man(Y) \wedge Vegetarian(Y)) \Rightarrow Like(X,Y))$

d.

$\exists X \forall Y ((Barber(X) \wedge Man(Y) \wedge \neg Shaves(Y,Y)) \Rightarrow Shaves(X,Y))$

e.

$\forall X (Politican(X) \Rightarrow ((\exists Y \forall T (T \in canfool(X,Y)) \vee \forall Y \exists T (T \in canfool(X,Y))) \wedge \exists Y \exists T (T \notin canfool(X,Y))))$

Task 2

$\forall X \forall Y \exists T ((Sock(X) \wedge Sock(Y) \wedge Pair(X,Y)) \Rightarrow (Before(Now,T) \wedge (Lost(X,T) \vee Lost(Y,T))))$