5.10 Example of Nonmonotonic Rules: Brokered Trade

This example shows how rules can be used in an electronic commerce application (which ideally will run on the Semantic Web). Brokered trades take place via an independent third party, the broker. The broker matches the buyer's requirements and the sellers' capabilities and proposes a transaction in which both parties can be satisfied by the trade.

As a concrete application we will discuss apartment renting,[6] a common activity that is often tedious and time-consuming. Appropriate web services can reduce the effort considerably. We begin by presenting the potential renter's requirements.

> Carlos is looking for an apartment of at least 45 sq m with at least two bedrooms. If it is on the third floor or higher, the house must have an elevator. Also, pet animals must be allowed.
>
> Carlos is willing to pay $300 for a centrally located 45 sq m apartment, and $250 for a similar apartment in the suburbs. In addition, he is willing to pay an extra $5 per square meter for a larger apartment, and $2 per square meter for a garden.
>
> He is unable to pay more than $400 in total. If given the choice, he would go for the cheapest option. His second priority is the presence of a garden; his lowest priority is additional space.

5.10.1 Formalization of Carlos's Requirements

We use the following predicates to describe properties of apartments:

$apartment(x)$ stating that x is an apartment

$size(x, y)$ y is the size of apartment x (in sq m)

[6] In this case the landlord takes the role of the abstract seller.