Übungen zur Vorlesung: Wissensbasierte Systeme

Blatt 5

Exercise 5.1:

s(X, Y)   voltage source
w(X, Y)   wire
b(X, Y)   bulb

The variables denote connection points. The behaviour of an intact source is described by the following rule:

level(X) ≠ level(Y) <- ok(s(X, Y))

a) Define similar rules for the behaviour of wires and bulbs.

b) The figure below shows a simple circuit consisting of a source, 4 wires and 2 bulbs. Desribe the circuit in a knowledge base.
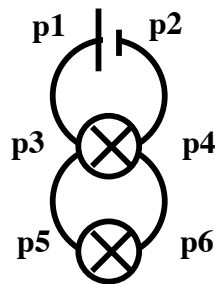
c) Because of a fault only the lower lamp is lit. Using Poole´s algorithm for deriving conflicts, determine the conflicts for the given situation. Show how diagnoses can be derived from the conflicts.

Exercise 5.2

Give Clark´s completion of the following knowledge base:

> g <- d ∧ ~c.
> a <- d ∧ ~c.
> a <- d.
> b <- e.
> d <- e.
> d <- f.
> f.
> c <- h

What literals are derived by a bottom-up proof procedure run on the above clauses?

Exercise 5.3

Give Clark´s completion of the knowledge base:

member(E, [E| L]).
member(E, [H| T]) <- member(E, T).
disjoint([ ], L).
disjoint([H| T], L) <- ~member(H, L) ∧ disjoint(T, L).

Show a bottom-up derivation that is able to answer the query:

?disjoint([a, d], [e, f]).