Exercise for the lecture Modeling Methods in Computer Science, Winter Semester 2007/08
Ingo Frommholz (LF 138)
Consultation-hour: Thursday, 15:00-16:00
mod07@is.inf.uni-due.de

Exercise Sheet 12 Due date: 23.01.2008, 14:00

Exercise 23: Prolog/SLD-Resolution

Given the following program in Prolog (also see exercise 22):

1 at_work(claudia).
2 at_work(klaus).
3 not_much_sleep(klaus).
4 much_sleep(claudia).

5 vivid(X) :- much_sleep(X).
6 tired(X) :- not_much_sleep(X).
7 coffeepowder.

8 needing_coffee(X) :- tired(X), at_work(X).
9 making_coffee(X) :- needing_coffee(X), coffeepowder.

Perform a (graphical) SLD-Resolution for the following query:

?- making_coffee(klaus)

10 Points

Exercise 24: Resolution in First Order Logic

Assuming that a, b, c and d are constants and x_i and y_i variables.

Please show that the following set of clauses is not satisfiable using resolution in first order logic. Illustrate the resolution in its graphical form, including all applied substitutions.

\{ \{B(a)\}, \{R(b)\}, \{\neg D(x_3, y_3), E(x_3, y_3)\}, \{\neg R(x_4), F(x_4)\}, \{\neg F(y_5), \neg E(x_5, y_5), F(x_5)\}, \{\neg B(x_6), \neg F(x_6)\}, \{B(c)\}, \{R(d)\}, \{D(c, d)\}\}

10 Points