TECHNISCHE UNIVERSITÄT DRESDEN

Faculty of Computer Science Institute of Theoretical Computer Science, Chair of Automata Theory

Term Rewriting Systems

Exercise Sheet 6

Dr. rer. nat. Rafael Peñaloza / Marcel Lippmann
Summer Semester 2014

Exercise 25

Let u, x, y, and z be variables. Use the unification algorithm recalled in the lecture to solve the following two unification problems:

a) $S_1 := \{f(h(x), g(x, u)) =^? f(z, g(f(y, y), z))\}$

b) $S_2 := \{h(x, g(x, y), y) =^? h(x, g(a, y), y),\ z =^? h(x, g(x, b), b)\}$

Exercise 26

From the unification algorithm recalled in the lecture, design a direct decision procedure for the matching problem.

Hint: 'Direct' means that no constants are introduced in the right term. Instead, the rules are to be modified such that the new algorithm returns 'the input terms do not match' or a matcher for the input terms as soon as possible.

Exercise 27

Prove the undecidability of the *uniform* halting problem by a reduction of the halting problem.