INFORMATIK

Universität des Saarlandes
FR Informatik

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Tutorials for "Decision Procedures for Logical Theories"
Exercise sheet 5

Exercise 5.1: (*4 P.*)
Use the results of Section 3.1 of the lecture to show that the word problem for associativity is decidable.

Exercise 5.2: (*3 P.*)
Use Example 4.1.4 of F. Baader and T. Nipkow, *Term Rewriting and All That*, to show that the uniform word problem for associativity is undecidable.

Exercise 5.3: (*7 P.*)
Construct the finite automaton corresponding to the linear equation

$$6 - 2x + 3y = 0$$

One can see from this automaton that the linear equation has infinitely many solutions in $\mathbb{N}$. How? Give two of them explicitly.

Exercise 5.4: (*6 P.*)
Let $t_1 = f(x, h(g(x)), x')$, let $t_2 = f(a, y, y)$, let $t_3 = f(z, h(z), h(b))$. Use the Martelli/Montanari unification algorithm to show which of the equality problems $\{t_1 \approx t_2\}$, $\{t_1 \approx t_3\}$, $\{t_2 \approx t_3\}$ are unifiable. Give a most general unifier if it exists.

Put your solution into the mail box at the door of room 627 in the MPI building (46.1) before November 28, 14:00.