Universität des Saarlandes
FR Informatik

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Tutorials for "Automated Reasoning"
Exercise sheet 9

Exercise 9.1: *(2 P)*
Let E be a set of equations, let $\theta : X \to T_\Sigma(X)$ be a substitution. Prove that $E \vdash t \approx t'$ implies $E \vdash t\theta \approx t'\theta$ for all terms t, t' over Σ.

Exercise 9.2: *(4 P)*
Is the rewrite system

$$\{\, f(a) \to f(b),\ f(b) \to f(c),\ f(c) \to f(a),\ f(x) \to x \,\}$$

(i) terminating, (ii) normalizing, (iii) locally confluent, (iv) confluent? Give a brief explanation.

Exercise 9.3: *(1 + 1 + 2 P)*
Compute the set of critical pairs for each of the following sets of rewrite rules:

$$R_1 = \{\, b \to c,\ b \to d,\ f(x) \to g(x) \,\}$$
$$R_2 = \{\, h(x, x) \to f(x),\ h(y, f(y)) \to b \,\}$$
$$R_3 = \{\, f(g(x)) \to g(x),\ g(h(g(x), f(y))) \to f(x) \,\}$$

Submit your solution in lecture hall 003 during the lecture on June 26. Please write your name and the date of your tutorial group (Mon, Thu, Fri) on your solution.

Note: Joint solutions, prepared by up to three persons together, are allowed (but not encouraged). If you prepare your solution jointly, submit it only once and indicate all authors on the sheet.