Magistère d'Informatique et Modélisation

Réécriture - TD n°7

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Completion

Exercise 1 *Knuth-Bendix algorithm*

Given a set of identities

$$\begin{array}{rcl} s(x+y) & = & s(x)+y \\ s(x+y) & = & x+s(y) \\ (x+y)+z & = & x+(y+z) \end{array}$$

Apply the completion procedure using the lexicographic path order $>_{lpo}$ induced by $s \sim +$.

Exercise 2 *fairness (équité)*

Discuss fairness (équité) on the term rewriting system

$$\begin{array}{lcl} f(g(h(x)) & \longrightarrow & g(x) \\ g(h(g(x)) & \longrightarrow & g(g(h(x)) \end{array}$$

Exercise 3 *encompassment (enchassmenet)*

Suppose that in the formulation of the rule (Collapse) one has only the condition $s \longrightarrow_R u$ for its application, without the additional condition required in this rule. Under this assumption consider the set of identities

$$\{f(g(f(x)) = f(g(x)), g(g(x) = g(x)\}$$

and the lexicographic path order $>_{lpo}$ induced by a precedence satisfying $f > g$.

Exercise 4 *failure (échec)*

Consider the set of identities

$$\{x * (y+z) = (x*y)+(x*z),\ (u+v)*w = (u*w)+(v*w)\}$$

and the lexicographic path order $>_{lpo}$ induced by a precedence satisfying $* > +$.