TP Programmation

L3

14 December 2010

We will implement the Knuth-Bendix completion procedure in this session.

Input A finite set E of identities and a reduction order $<$ on terms.

Output A finite convergent TRS R that is equivalent to E, if the procedure terminates successfully; "`Fail`" if the procedure terminates unsuccessfully.

Initialization Orient the identities in E to get an initial term rewriting system R_0. Use the reduction order $<$ to find the direction of orientation.

repeat Check for termination. If it does not terminate, output "`Fail`" .
Check for local confluence and obtain the critical pairs if any. Check if they are joinable. If they are not, add a new rule into the term rewriting system (use the reduction order $<$ to find the direction of orientation) so that the critical pair under consideration becomes joinable.

until no new rules are added to the term rewriting system.

Warning: The addition of new rules might make the system non terminating and/or add new critical pairs.