INFORMATIK

Universität des Saarlandes
FR Informatik

Harald Ganzinger
Uwe Waldmann

October 31, 2002

Tutorials for "Decision Procedures for Logical Theories"
Exercise sheet 2

Exercise 2.1: (*5 P.*)
Give an example of a rewrite system R such that R is not terminating but uniquely normalizing.

Exercise 2.2: (*5 P.*)
Give an example of a rewrite system R with the following properties:

- R consists of a single rewrite rule $l \Rightarrow r$,
- all variables of r occur also in l,
- $\Rightarrow_R$ is terminating,
- $\Rightarrow_R$ is not confluent.

Exercise 2.3: (*5 P.*)
Let R be the following set of rewrite rules:

$$\begin{aligned} \{\, g(f(a), f(y)) &\Rightarrow b, \\ f(g(x, x)) &\Rightarrow f(x), \\ a &\Rightarrow g(a, a) \,\} \end{aligned}$$

Compute all critical pairs between rules in R and check whether they are joinable in R.

Exercise 2.4: (*5 P.*)
Prove or refute that the following rewrite system is terminating:

$$\begin{aligned} \{\, f(f(x)) &\Rightarrow g(g(g(x))), \\ g(g(x)) &\Rightarrow f(x) \,\} \end{aligned}$$

Put your solution into the mail box at the door of room 627 in the MPI building (46.1) before November 7, 14:00.

Note: In case of group work, write the names of all group members (not more than three!) on a single solution sheet. Do not submit several identical solution sheets.