

Algorithm RIGHT_GROUND_TERMINATION(\mathcal{R})

Input: A TRS \mathcal{R} without variables on right-hand sides.

Output: “*True*”, if \mathcal{R} terminates and “*False*”, otherwise.

1. For $\mathcal{R} = \{l_1 \rightarrow r_1, \dots, l_n \rightarrow r_n\}$ let $T_i = \{r_i\}$, $1 \leq i \leq n$.
2. For all i let $T_i = \{t \mid s \in T_i, s \rightarrow_{\mathcal{R}} t\}$.
3. If $T_i = \emptyset$ for all i ,
then return “*True*” and stop.
4. If there exists an i and a $t \in T_i$ such that $t \triangleright r_i$,
then return “*False*” and stop.
5. Go back to Step 2.

Lemma 4.2.3

For all TRSs \mathcal{R} without variables on right-hand sides we have:

\mathcal{R} terminates iff there is no rule $l \rightarrow r$ with $r \rightarrow_{\mathcal{R}}^+ t$ and $t \triangleright r$.