Faculty of Computer Science Institute of Theoretical Computer Science, Chair of Automata Theory

Term Rewriting Systems

Exercise Sheet 14

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Exercise 65

Give an example for an admissible order on M_n different from $\succ$ defined in the lecture.

Exercise 66

Let $\succ$ be a *well-founded* total order on M_n. Show that under this assumption, we have:

$$m_1 \prec m_2 \Rightarrow m \cdot m_1 \prec m \cdot m_2 \qquad \text{implies} \qquad m_1 \mid m_2 \Rightarrow m_1 \preceq m_2.$$

Exercise 67

Let G be a finite set of polynomials with head coefficients 1, and let $J := \langle G \rangle$ be the ideal generated by G. Show the following:

- If $f, g \in G$, then $S(f, g) \in J$.
- If $f \in J$ and $f \xrightarrow{*}_G h$, then $h \in J$.

Exercise 68

Apply Buchberger's algorithm to $F := \{X_1^2 X_2 - X_1^2, \; X_1 X_2^2 - X_2^2\}$.