

LPO with Status

Assign a permutation of $1, \dots, n$ to every n -ary function symbol f , compare arguments lexicographically in this order for lpo.

$$\begin{array}{ll} \text{pred}(\mathcal{O}) & \rightarrow \mathcal{O} \\ \text{pred}(\text{succ}(x)) & \rightarrow x \\ \text{minus}(x, \mathcal{O}) & \rightarrow x \\ \text{minus}(x, \text{succ}(y)) & \rightarrow \text{minus}(\text{pred}(x), y) \end{array} \qquad \begin{array}{ll} \text{plus}(\mathcal{O}, y) & \rightarrow y \\ \text{plus}(\text{succ}(x), y) & \rightarrow \text{succ}(\text{plus}(y, x)) \end{array}$$

Multiset Relation

$M \succ_{mul} N$ iff there exist $X, Y \in \mathcal{M}(T)$ with

- $\emptyset \neq X \subseteq M$
- $N = (M \setminus X) \cup Y$
- for every $y \in Y$ there exists an $x \in X$ with $x \succ y$