Rewriting - TD n°2

Multiset orderings, Newman's Lemma

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Exercise 1 *multisets*

If $(A, >)$ is a strict order, then $(\mathcal{M}(A) >_{mult}$ is a strict order.

Exercise 2 *multiset orderings*

Prove the following equivalences, where $>_{mult}$ is the multiset ordering defined at the course:

(i) $M >_{mult} N$ iff $M \neq N$ &
$[\forall x(N(x) > M(x)) \Rightarrow \exists y \in M(y > x \;\&\; M(y) > N(y))]$.

(ii) $M >_{mult} N$ iff $M >^*_{lex} N$ for all total orderings $>^*$ that contain $>$, where $M >^*_{lex} N$ means that one sorts the elements of M and N for the order $>^*$ and then get two lists that one compares lexicographically.

Exercise 3 *Newman's Lemmas*

Prove a variant of Newman's Lemma (details on the attached sheet).