

Problem Set Seven: Trees

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Linguistics 680

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These problems are due Tue. Nov. 15.

Problem 1

Prove the theorem (7.1) that any nonempty finite order has a minimal element. [Hint: see proof sketch in FFLT 7.3.]

Problem 2

Provide the rest of the proof of the theorem (7.2) that, for any $n \in \omega$, any chain of cardinality n is order-isomorphic to the usual order \leq on ω .

Problem 3

Prove the theorem (7.4) that no node in a tree can dominate one of its sisters.

Problem 4

Prove the corollary (7.2) that two distinct nodes in a tree have a meet (glb) iff they are comparable.

Problem 5

Prove the theorem (7.6) that any two nodes in a tree have a join (lub).

Problem 6

Prove the theorem (7.7) that for any node a in an ordered tree, the set of daughters of a ordered by \leq (linear precedence) is a chain.

Problem 7

Prove the theorem (7.8) that the set of terminal nodes (leaves) of an ordered tree ordered by \leq (linear precedence) is a chain.

Problem 8

Based on the CFG in FFLT section 7.1, give two different phrase structures that analyze the ambiguity of the string

He saw her duck.

If necessary, it's permissible to extend the grammar by adding new terminals, nonterminals, lexical entries, and phrase structure rules. Discuss any issues arising that seem significant to you.

Problem 9

Same as the preceding, for the string

I know you like the back of my hand.