58 (prefix order) Give axioms to define the prefix partial order on strings. String $S$ comes before string $T$ in this order if and only if $S$ is an initial segment of $T$.

After trying the question, scroll down to the solution.
§ Use $\preceq$ for the prefix partial order. It can be defined as

- $\text{nil} \preceq S$
- $S \preceq \text{nil} \equiv S = \text{nil}$
- $i;S \preceq j;T \equiv i = j \land S \preceq T$

where $S$ and $T$ are strings, and $i$ and $j$ are items. Or it can be defined as

- $S \preceq T \equiv \leftrightarrow S \leq \leftrightarrow T \land S = T_0;\ldots;\leftrightarrow S$

After we meet quantification it can be defined as

- $S \preceq T \equiv \exists U: \star X: S; U = T$

where $X$ is the alphabet of symbols.