Problem Sheet #4

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Problem 4.1: *Prefix order relations*

Let Σ be a finite set (called an alphabet) and let $\Sigma*$ be the be the set of all words that can be created out the symbols in the alphabet Σ. ($\Sigma*$ is the Kleene closure of Σ, which includes the empty word ϵ). A word $p \in \Sigma*$ is called a prefix of a word $w \in \Sigma*$ if there is a word $q \in \Sigma*$ such that $w = pq$. A prefix p is called a proper prefix if $p \neq w$.

a) Let $\preceq \subseteq \Sigma*$ x $\Sigma*$ be a relation such that $p \preceq w$ for p, $w \in \Sigma$ if p is a prefix of w. Show that $\preceq$ is a partial order.

Let's assume that the relation is partial order relation. We will see if it holds or not.

In order for a relation to be a partial order. It must possess there properties:
a) The relation must be **reflexive**.
b) The relation must be **antisymmetric**.
c) The relation must be **transitive**.

Relexive relation is defined by:

A relation is reflexive if $\forall p \in$ A, $x(p,p) \in$ R. where R is the universal set.

Here the relation is reflexive because it p
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