prefix set

Canonical name	PrefixSet
Date of creation	2013-03-22 16:11:56
Last modified on	2013-03-22 16:11:56
Owner	Mazzu (14365)
Last modified by	Mazzu (14365)
Numerical id	6
Author	Mazzu (14365)
Entry type	Definition
Classification	msc 20M05
Defines	prefix
Defines	prefix set
Defines	proper prefix
Defines	prefix closed
Defines	prefix closure
Defines	prefix free

Let X be a set, and $w \in X^*$ be a word, i.e. an element of the free monoid on X. A word $v \in X^*$ is called *prefix* of w when a second word $z \in X^*$ exists such that $x = vz$. A *proper prefix* of a word u is a prefix v of u not equal to u (sometimes v is required to be non-empty).

Note that the empty word ε and w are prefix of w, and a proper prefix of w if w is non-empty.

The *prefix set* of w is the set $\mathrm{pref}(w)$ of prefixes of w, i.e. if $w = w_1 w_2 ... w_n$ with $w_j \in X$ for each $j \in \{1, ..., n\}$ we have

$$\mathrm{pref}(w) = \{\varepsilon,\ w_1,\ w_1 w_2,\ ...,\ w_1 w_2 ... w_{n-1},\ w\}.$$

Some closely related concepts are:

1. A set of words is *prefix closed* if for every word in the set, any of its prefix is also in the set.

2. The *prefix closure* of a set S is the smallest prefix closed set containing S, or, equivalently, the union of the prefix sets of words in S.

3. A set S is *prefix free* if for any word in S, no proper prefixes of the word are in S.