

## PREFIX TREES

## Why

## **Definition**

Let X and A be finite sets and  $c: X \to \mathcal{S}(A)$ . The maximum length of a code is the length of the longest codeword. We denote by  $\mathcal{S}^{\ell}(A)$  the strings of length smaller than  $\ell$  in A.

The prefix-tree of depth k corresponding to c is the tree  $(\mathcal{S}^k(A), T)$  where  $\{s, t\} \in E$  if s is a prefix of t and their lengths differ by one.

**Proposition 1.** If the code  $c: X \to \mathcal{S}(A)$  is prefix free, then no vertex in c(X) is the ancestor of another vertex in c(X).

