

Substitutive systems and Cobham's theorem

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Abstract

A k -automatic sequence is a sequence whose n -th term is produced from the digits of n in base k using a finite procedure (more precisely, a deterministic finite automaton with output). Automatic sequences have links with multiple branches of mathematics and computer science: together with various generalisations they appear, for example, in formal language theory, number theory (most notably, in transcendence theory) or fractal geometry. One of the most fundamental results about automatic sequences is Cobham's theorem which classifies sequences that are simultaneously automatic with respect to two multiplicatively independent bases: these are precisely the sequences that are ultimately periodic.

During the talk we will study a wider class of sequences - substitutive sequences - from the dynamical and ergodic-theoretic point of view. We will prove standard results concerning the substitutive systems associated with a primitive substitution: we will show that such systems are always minimal and uniquely ergodic. We will also discuss more recent developments such as the dynamical structure of substitutive systems associated with a nonprimitive substitution as well as a dynamical approach to Cobham's theorem and its various generalisations.