

Automatic sets and difference equations

Michael F. Singer *

singer@math.ncsu.edu

A set of integers is said to be m -automatic if there is a finite automaton that decides if an integer is in this set given its base- m representation. For example powers of 2 are 2-automatic but not 3-automatic. This latter result follows from a theorem of Cobham describing which sets of integers are m - and n -automatic for sufficiently distinct m and n . In recent work with Reinhard Schaefer, we gave a new proof of this result based on analytic results concerning normal forms of systems of difference equations. In this talk, I will describe the ideas involved in this proof.

*Department of Mathematics, North Carolina State University, Raleigh, NC 27695-8205, USA