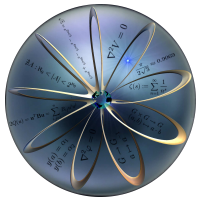

planetmath.org

Math for the people, by the people.

automatic group

Canonical name	AutomaticGroup
Date of creation	2013-03-22 14:16:54
Last modified on	2013-03-22 14:16:54
Owner	mathcam (2727)
Last modified by	mathcam (2727)
Numerical id	7
Author	mathcam (2727)
Entry type	Definition
Classification	msc 20F10
Related topic	AutomaticPresentation
Defines	automatic semigroup
Defines	automatic structure

Let G be a finitely generated group. Let A be a finite generating set for G under inverses.

G is an *automatic group* if there is a language $L \subseteq A^*$ and a surjective map $f : L \to G$ such that

- L can be checked by a `http://planetmath.org/DeterministicFiniteAutomaton`finite automaton
- The language of all convolutions of x, y where $f(x) = f(y)$ can be checked by a
- For each $a \in A$, the language of all convolutions of x, y where $f(x).a = f(y)$ can be checked by a

(A, L) is said to be an *automatic structure* for G.

Note that by taking a finitely generated semigroup S, and some finite generating set A, these conditions define an *automatic semigroup*.