Kolmogorov complexity

Canonical name	KolmogorovComplexity
Date of creation	2013-03-22 13:43:41
Last modified on	2013-03-22 13:43:41
Owner	tromp (1913)
Last modified by	tromp (1913)
Numerical id	9
Author	tromp (1913)
Entry type	Topic
Classification	msc 68Q30
Synonym	algorithmic information theory
Synonym	algorithmic entropy

Consider flipping a coin 50 times to obtain the binary string 0001010000010101000100001010100
Can we call this random? The string has rather an abundance of 0s, and on closer inspection every other bit is 0. We wouldn't expect even a biased coin to come up with such a pattern. Still, this string has probability 2^{-50}, just like any other binary string of the same length, so how can we call it any less random?

Kolmogorov Complexity provides an answer to these questions in the form of a measure of information content in individual objects. Objects with low information content may be considered non-random. The topic was founded in the 1960s independently by three people: Ray Solomonoff, Andrei Kolmogorov, and Gregory Chaitin.

See Kolmogorov complexity function and invariance theorem for more details.