



Math for the people, by the people.

strong law of large numbers

Canonical name	StrongLawOfLargeNumbers
Date of creation	2013-03-22 13:13:10
Last modified on	2013-03-22 13:13:10
Owner	Koro (127)
Last modified by	Koro (127)
Numerical id	11
Author	Koro (127)
Entry type	Definition
Classification	msc 60F15
Related topic	MartingaleProofOfKolmogorovsStrongLawForSquareIntegrableVariables

A sequence of random variables X_1, X_2, \dots with finite expectations in a probability space is said to satisfy the *strong law of large numbers* if

$$\frac{1}{n} \sum_{k=1}^n (X_k - E[X_k]) \xrightarrow{a.s.} 0,$$

where *a.s.* stands for convergence almost surely.

When the random variables are identically distributed, with expectation μ , the law becomes:

$$\frac{1}{n} \sum_{k=1}^n X_k \xrightarrow{a.s.} \mu.$$

Kolmogorov's strong law of large numbers theorems give conditions on the random variables under which the law is satisfied.