

Main Results for Convergence in Probability and in Distribution
Stat 543 Spring 2005

Definitions of convergence in probability and in distribution

Convergence in probability implies convergence in distribution

Convergence in distribution to a constant implies convergence in probability to that constant

Regarding Convergence in Probability:

- Convergence of all marginals in probability is equivalent to convergence in probability
- WLLN (in its various forms)
- Convergence in probability of X_n to X plus continuity of g on a set of X probability 1 implies convergence in probability of $g(X_n)$

Regarding Convergence in Distribution:

- Convergence of mgfs (or characteristic functions) implies convergence in distribution
 - CLT
- Convergence in distribution of one marginal plus convergence in probability of the second to a constant implies convergence of the vector in distribution
- Convergence in distribution of X_n to X plus continuity of g on a set of X probability 1 implies convergence in distribution of $g(X_n)$

Application of the material to produce the 1st and 2nd order "Delta Methods"