Abstract

The coefficient of variation (CV) of a population is defined as the ratio of the population standard deviation to the population mean. It is regarded as a measure of stability or uncertainty, and can indicate the relative dispersion of data in the population to the population mean. In this article, based on the upper record values, we study the behavior of the CV of a random variable that follows a Lomax distribution. Specifically, we compute the maximum likelihood estimations (MLEs) and the confidence intervals of CV based on the observed Fisher information matrix using asymptotic distribution of the maximum likelihood estimator and also by using the bootstrapping technique. In addition, we propose to apply Markov Chain Monte Carlo (MCMC) techniques to tackle this problem, which allows us to construct the credible intervals. A numerical example based on a real data is presented to illustrate the
implementation of the proposed procedure. Finally, Monte Carlo simulations are performed to observe the behavior of the proposed methods.

References

- J. Gong and Y. Li, Relationship between the estimated Weibull modulus and the coefficient of variation of the measured strength for ceramics, J. Am. Ceramics Society, 82 (1999), no. 2, 449–452.


Index Terms

Computer Science

Algorithms

Keywords

Lomax distribution  Coefficient of variation  Markov chain Monte Carlo  Upper record value

Bootstrap