

Methods for estimating the 2-parameter Weibull distribution with type-1 censored data

Abstract

This study is concerned with the two-parameter Weibull distribution which has and is still being used as a model in life testing and reliability engineering. We seek to find out whether Rank Regression Method can be a good alternative to that of the world publicised traditional method known as Maximum Likelihood for estimating two parameters of the Weibull distribution. The methods under consideration are: Maximum Likelihood Estimation, Least Square Estimation on Y and that of Least Square Estimation on X. These estimators are derived for Random Type-I censored samples. These methods were compared using Mean Square Error and Mean Percentage Error through simulation study with small, medium and large sample sizes in estimating the Weibull parameters under Type-I censored data. The observations that are made based on this study are that Maximum Likelihood Estimator stands out when estimating the scale parameter followed by Least Square Estimator on X but for the shape parameter Least Square Estimator on X performed better than Maximum Likelihood Estimator thereby making it a good alternative method to MLE.

Keyword: Ls estimation on x; Ls estimation on y; Maximum likelihood estimation; Random type-i censoring; Simulation study; Weibull distribution.