Bayesian Prediction Based on Doubly Censored Generalized Order Statistics from a Class of Distributions

Tahani A. Abushal
Assisstant Professor
Department of Mathematics, Faculty of Applied Science, Umm Al-Qura University, Saudi Arabia
tabushal@yahoo.com

Abstract

In this paper, we consider the Bayesian approach to predict the future generalized order statistics (gos) based a certain class of exponential-type distributions. This class of distributions includes several important distributions such as, Weibull, Burr-XII, Pareto, Gombertz distributions. We used the joint pdf of nonadjacent (adjacent) gos’s to make Bayesian predictions intervals for future gos’s based on a doubly type-II censoring samples. A general class of prior density functions is used and the predictive reliability function is obtained in the one sample case. The investigation of doubly type-II censored gos’s samples generalized the results for ordinary order statistics and upper records as special cases. The results obtained in this paper have been applied to member of the class to illustrate the use of the survival function in obtaining predictive bounds of future gos, Such member is Weibull ($\theta, \tau$) model. We considered two cases: only one parameter is unknown ($\theta$), and both parameters are unknown ($\theta, \tau$). Finally, based on a given doubly type-II censored samples, numerical computations have been carried out for prediction of future life time and their actual (simulated) prediction levels in the case of ordinary order statistics. Furthermore, the above prediction procedure in the upper record values from one parameter unknown case of Weibull model is demonstrated by using simulated sets of upper record values generated from it.