Some Contributions to the Study of Order Statistics for Independent and Nonidentically Distributed Random Variables

Order statistics for independent nonidentically distributed random variables (inid) is widely discussed in literature, especially, calculations of the moments for these statistics. Therefore, our aim of this thesis is to provide some contributions to their moments for continuous distributions not studied before such as three parameters Beta type I distribution, Erlang Truncated Exponential distribution, Exponentiated Frechet distribution and family of distributions. Also this thesis surveys the best methods available to be used in this context. We introduced a method of finding a single moment; which is the moment generating function technique and applied it to Exponential and Erlang truncated Exponential distributions. It facilitated the calculations of moments of inid from Burr type II distribution. The L-moments and also Trimmed L-moments were obtained for distributions under study for the (inid) case. Also we intentionally used approximation in the case of an outlier that follows either the normal or gamma distribution in a sample of (inid) from Burr XII distribution approximating gamma and normal by Burr XII distribution. We studied also a new distribution that is the Sine square distribution where we found order statistics for this distribution and moments for these statistics in case of (iid) or (inid).

Finally, we studied the subject of (inid) discrete random variables, in terms of finding the moments and applied it on some discrete distributions like Geometric, Binomial and Poisson.