The Kumaraswamy Marshall-Olkin log-logistic distribution with application

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Abstract

In this paper, we define and study a new lifetime model called the Kumaraswamy Marshall-Olkin log-logistic distribution. The new model has the advantage of being capable of modeling various shapes of aging and failure criteria. The new model contains some well-known distributions as special cases such as the Marshall-Olkin loglogistic, log-logistic, lomax, Pareto type II and Burr XII distributions. Some of its mathematical properties including explicit expressions for the quantile and generating functions, ordinary moments, skewness, kurtosis are derived. The maximum likelihood estimators of the unknown parameters are obtained. The importance and flexibility of the new model is proved empirically using a real data set.