TOPP-LEONE POWER MUTH DISTRIBUTION: PROPERTIES, ESTIMATION AND PREDICTION

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SUMMARY

A new flexible lifetime model named as Topp-Leone power Muth distribution is introduced in this paper. The distribution is a generalization of the power Muth distribution depending on the genesis of the Topp-Leone distribution. The new model is capable of modeling various shapes of lifetime data. Some of its main statistical properties including ordinary moments, probability weighted moments, quantiles, mean residual life function, entropies, order statistics and their moments are studied. The maximum likelihood method is applied to estimate the unknown parameters. Also a new observation is predicted based on one-sample prediction. Simulation studies are performed to illustrate the theoretical results and the precision of the maximum likelihood estimators. Two real data sets are applied to demonstrate the importance and flexibility of the new model. Moreover the goodness of fit of the proposed distribution is compared to some other distributions using standard statistical criteria and plots, which validate the importance of the proposed model.

Keywords and phrases: Maximum likelihood estimation; Maximum likelihood prediction; Moments; order statistics; Monte-Carlo simulation; Topp-Leone power Muth distribution.

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