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MARSHALL-OLKIN-RATHIE-SWAMEE DISTRIBUTION AND APPLICATIONS

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Abstract: The new tilted generalized logistic distribution, also called Marshall-Olkin-Rathie-Swamee (MORS) distribution, is studied in some detail. This distribution is important because it is multimodal and generalizes the logistic distribution among others. Moments and order statistics are given. The reliability $P(X < Y)$, for X and Y independent generalized logistic and beta-generated MORS distributions, is obtained along with its particular cases. Also it is proved that the beta-generated MORS distribution is an infinite linear combination of a new distribution which is obtained from powers of MORS distribution. Maximum likelihood method is used to estimate the parameters of the distribution. Four applications, with real data, are presented to illustrate the applicability of the proposed distribution. For corresponding non-negative random variable, which resulted in a generalization of the Harris extended exponential (HEE) distribution, moments are obtained extending a recent result given for Marshall-Olkin exponential Weibull (MOEW) distribution.

Keywords and Phrases: MORS, MOEW and HEE distributions, Generalized hypergeometric functions, Reliability analysis, Beta-generated distributions.

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1. Introduction

In this article, we introduce a new tilted (skew) multimodal distribution with four parameters illustrating its usefulness in modeling four real data sets. Since it unifies a few previously available distributions, we hope that this new flexible distribution will attract more future research work.

Estimation of parameters is done by likelihood maximization procedure. Our model is very flexible to fit different unimodal and bimodal data. We could not