Power Komal Distribution with Properties and Application to Model Failure Time Data from Engineering

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A B S T R A C T

The failure time data in engineering are highly stochastic in nature and it modeling is really a challenging task for data scientists. Statistical distributions derived using power transformations of standard distributions are very much useful for modeling failure time data from engineering. Following the approach of deriving Weibull distribution from exponential distribution, an attempt has been made to derive a Power Komal distribution which includes Komal distribution, as a particular case. The shapes of density for varying values of parameters, the moments about the origin, the variance, survival function, hazard function, mean residual function of power Komal distribution have been discussed. The method of maximum likelihood for estimating the parameters has been discussed. Finally, the goodness of fit of PKD has been discussed with a real failure time data from engineering and the fit has been found quite satisfactory as compared to one parameter exponential, Shanker and Garima distributions and two-parameter Power Shanker distribution, power Garima distribution and Weibull distribution. Therefore, PKD can be considered as an important lifetime distribution for modeling lifetime data from engineering.

Keywords: Komal distribution, Descriptive measures, Reliability properties

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