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Estimation of stress-strength reliability $R = P(X > Y)$ based on Weibull record data in the presence of inter-record times

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Abstract A considerable body of literature has been recently devoted to the inference problem of the reliability parameter $R = P(X > Y)$ based on record data. In this article, we consider the records as well as the corresponding inter-record times to develop inference procedures for R assuming X and Y come from Weibull distribution. The maximum likelihood estimator of R and its corresponding confidence interval are determined. Bayesian analyses involving Tierney and Kadane's approximation and Metropolis-Hasting samplers are used to estimate R based on LINEX and square error loss functions. In addition, the estimation problem of R is discussed in the models with known shape parameters. To compare all methods developed here, numerical simulation is carried out. Finally, different real data sets are analyzed.

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1. Introduction

The stress-strength reliability $R = P(X > Y)$ plays an important role in many practical fields including medicine, quality control and engineering. It measures the probability that the random strength X exceeds the stress Y of a component ([1]). Another example of this problem is comparing the lifetime of two devices which are represented by X and Y . The

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