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Sensitivity and Influence Analysis of Estimators of Correlation Coefficients

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Abstract

A number of methods are now available in the literature for measuring the coefficient of correlation. Many of them are introduced recently to address the robustness issue of the correlation coefficient in the presence of outliers and departure from normality. But not much work has been done to investigate their relative performances through simulation and bootstrap and also from the view point of sensitivity and influence. In this paper an attempt has been made to compare performances of fifteen correlation coefficients using real data and simulation, bootstrap and influence function. We investigate the bias, standard error, MSE, length of 90 percentile interval, sensitivity curve of each estimator under a variety of situations and also employ probability plot, box plot and perspective plot to judge their performances. We observe that the class of robust estimators perform better than the class of non-robust estimators in general and the normal score estimator has shown the best performance overall.

Keywords: Correlation coefficient, robust estimator, Monte Carlo simulation, bootstrap, influence function, sensitivity curves.

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