Constrained Bayesian Method for testing Equi-Correlation Coefficient

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Abstract: The problem of testing equi-correlation coefficient of a standard symmetric multivariate normal distribution is considered. Constrained Bayesian and classical Bayes methods, using the maximum likelihood estimation and Stein's approach, are examined. For the investigation of the obtained theoretical results and choosing the best among them, different practical examples are computed using computer codes developed on MATLAB. Simulation results showed that Constrained Bayesian method (CBM) using Stein's approach gives opportunities to make decisions with higher reliability for testing hypotheses concerning equi-correlation coefficient then Bayes method. Also, the CBM with Stein's approach when using the distribution laws of linear combinations of chi-square random variables gives better results compared to the use of integrated distribution laws as in the number of used observations, providing necessary reliabilities, as well in the convenience of the practical use. Recommendation for the use of the developed methods at solving practical problems are given.