Application of Jordan algebra and its inference in linear models

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Abstract

Properties of Jordan algebra (Jordan 1934) or quadratic subspace (Seely, 1977; Zmyślony, 1980) will be discussed from the point of view of statistical applications to inference in univariate and multivariate normal models. Both estimation and testing hypotheses will be presented. Special cases for random effects model and blocked compound symmetric (BCS) covariance structure for doubly multivariate observations (m dimensional observation vector repeatedly measured over u locations or time points), which is a multivariate generalization of compound symmetry covariance structure for multivariate observations, was introduced by Rao (1945, 1953) while classifying genetically different groups, and then Arnold (1979) studied this BCS covariance structure while developing general linear model with exchangeable and jointly normally distributed error vectors. The test about covariance structure will be presented.

Keywords

Testing hypotheses, Estimation of parameters, Jordan algebra, Linear models.

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