ANOVA and the minimal least squares estimator

Oskar Maria Baksalary[1] **and Götz Trenkler**[2]

[1]*Faculty of Physics, Adam Mickiewicz University, Poznań, Poland*
[2]*Faculty of Statistics, Dortmund University of Technology, Dortmund, Germany*

Abstract

The one-way classification model of ANOVA (analysis of variance) is considered by exploiting an original approach based on an expression for the Moore–Penrose inverse of a columnwise partitioned matrix. In consequence, various original characteristics of the model are established. It is shown, inter alia, that the common estimator of ANOVA, obtained as a solution to the normal equations, is not necessarily the minimal least squares estimator.

Keywords

Analysis of variance; estimation theory; expectation value; experimental data processing; Moore–Penrose inverse; partitioned matrix; UMVU estimator