

# Two interesting metric matrices in statistics

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## Abstract

Metric (weight) matrices often play an important role in the estimation of linear and bilinear models as a way of differentially weighting, and/or of decorrelating correlated observations. In this paper, we discuss two examples of metric matrices useful in statistics, one arising from a ridge type of regularization technique (Takane & Hwang, 2004; Takane & Yanai, 2003), and the other arising from an instrumental variable estimation (Takane & Yanai, 1999) in linear models. We show some interesting properties of these matrices. In both cases, they are closely related to the transformations necessary to go from primal bases (of a data matrix) to dual bases (of its generalized inverse), and vice versa (Yanai & Takane, 2003).

## Keywords

Rank additivity, Oblique projectors, Dual bases, Ortho-normalizing metrics.

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