

Linear Algebra and Linear Models

Kalyan Das



Linear Algebra and Linear Models
(2nd Edn)

by R P Bapat

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This monograph provides an introduction to the basic aspects of the theory of linear estimation and that of testing linear hypotheses. The primary objective is to provide a basic knowledge of analysis of linear models to advanced undergraduate or first year Master's students. The second edition virtually covers the same topics as the first edition. Only chapters 4 and 6 have two new sections – (4.6) and (6.4), respectively. My comments apply to material in both the old and new editions.

The monograph has been organised as follows: chapter 1 gives a prerequisite knowledge of algebra with some interesting non-conventional proofs of some standard results. Chapters 2 and 3 discuss linear estimation and linear hypothesis testing, respectively. The contents of chapter 4 are somewhat mixed. It includes several results on eigenvalues and singular values that are of use in statistics. The optimality aspects of block designs have

been briefly outlined in chapter 5 while in chapter 6, some results on generalized inverses are discussed. An attractive feature of this monograph is the inclusion of several exercises, and hints and solutions there of, at the end of each chapter. This will certainly be of immense benefit to students.

It is quite easy to point out drawbacks in a book of this nature. '*Linear Algebra and Linear Models*' is no exception. There will always be differences of opinion on the choice of topics and the depth of their coverage. Such differences are due to differing interests of instructors, differing backgrounds of students and differing reasons for their taking a course on linear models. In my view, chapters 2 and 3 should be more comprehensive; I hope that in a future edition the author makes it so without making the monograph much heavier. In fact, I feel that the author has not ventured sufficiently deeply into any of the topics considered in these two chapters. Further, I believe that the chapters on algebra should come one after another – as of now, chapters 1, 4 and 6 look rather isolated.

Overall the monograph is well laid out and pleasant in appearance. Master's degree students taking a course on linear algebra could certainly consider this for their text.

Kalyan Das, Department of Statistics, Calcutta University, 35 Ballygunge Circular Rd, Calcutta 700 019, India.