

## BOOK REVIEWS

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C. R. RAO, *Linear Statistical Inference and Its Applications*, John Wiley and Sons, Inc., New York, 1965. \$14.95. xviii + 522 pp.

Review by FRANKLIN A. GRAYBILL

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In the preface the author has stated that his purpose in writing this book is ". . . to present up-to-date theory and techniques of statistical inference in a logically integrated and practical form." In addition he has stated "Essentially, it incorporates the important developments in the subject that have taken place in the last three decades. It is written for readers with a background knowledge of mathematics and statistics at the undergraduate level."

The book is divided into eight chapters and consists of 522 pages. It has an author index in addition to a subject index. At the end of each chapter there is a set of references and a large number of problems. Some illustrative examples are included. Below is the title and a brief outline of each chapter.

CHAPTER 1. *Algebra of Vectors and Matrices*. In this chapter vector spaces and subspaces are defined; matrices and determinants and solutions of sets of linear equations are discussed, as well as techniques for reducing matrices to triangular form, echelon form, diagonal form, etc. Transformations, projections and generalized inverses are discussed. Some of the pertinent theorems on quadratic forms which include characteristic roots and canonical matrices are discussed. Also included are: some theorems and discussion of convex sets in vector spaces; inequalities based on vectors, matrices, and determinants; extrema of quadratic forms. This chapter has a very good set of problems. Chapter 1 contains a great deal of both necessary and useful material for anyone who intends to study statistics at a graduate level. However, the material is supplemental in nature and one should certainly have had a least a one-semester course in matrix algebra in order for this chapter to be a significant help. The chapter is very valuable in that it contains many of the theorems that the reader will find useful in the remainder of this book. It, however, does more; the chapter contains many theorems, not necessary for the remainder of the book, that the reader will find useful as a reference. A student who plans to do graduate study in statistics could well refer to the theorems and the problems in this chapter at the time he takes his first course in undergraduate matrix or linear algebra. The proofs are too skimpy for someone who has not had such a formal course.

CHAPTER 2. *Probability Theory, Tools and Techniques*. This chapter includes