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TWO BOOKS ON MULTIVARIATE ANALYSIS

ROBB J. MUIRHEAD, *Aspects of Multivariate Statistical Theory*. John Wiley and Sons, New York, 1982, xix + 673 pages, $39.55.

MORRIS L. EATON, *Multivariate Statistics. A Vector Space Approach*. John Wiley and Sons, New York, 1983, xvi + 512 pages, $34.95.

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With the appearance of these two excellent books, the literature in the field of multivariate analysis has been greatly enriched. This is all the more remarkable since in recent years there has not exactly been a paucity of available books on this subject. On the contrary, since the classic by T. W. Anderson (1958), there has been a proliferation of high quality texts. A conservative count reveals more than sixteen books aimed at the general statistician (as opposed to, say, the psychometrician or other specialized applicators). But the field of multivariate analysis is extremely broad and offers something to everybody, from the highly theoretical to the very applied. The existing literature reflects this and by and large different books stress different aspects of the field. This makes it possible for a relatively large number of books to live peacefully together and complement each other rather than compete.

The above remarks apply in particular to the two books under review. The latter have a lot in common and yet there is almost no overlap, either with each other or with any of the other multivariate books. Neither book aims at a comprehensive treatment of the subject (but Muirhead's can claim somewhat greater completeness than Eaton's). The purpose of each of the two books is to emphasize certain aspects of multivariate analysis that have not been treated sufficiently in textbooks before. This aim is explicit in the title of Muirhead's book; it is somewhat less so in the title of Eaton's book, except for its subtitle. The aspects stressed by Muirhead are: (1) group methods and exterior differential forms in the treatment of distributional problems; (2) zonal polynomials and hypergeometric functions of matrix argument to express noncentral distributions; (3) asymptotic distributions. The aspects emphasized by Eaton are (1) vector space methods; (2) group methods for distributional problems, including invariant measures on locally compact groups and homogeneous spaces.

What the two books have in common is their emphasis on invariance and group methods. There is a good deal more on those topics here than one can find in other comparable books (with the exception, of course, of Farrell, 1976; and Giri, 1977, also has a bit on group methods). But there are great differences in

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