

variables, leading to an analysis of vector sums of squares. A multivariate analogue of the variance  $\sigma^2$  of a univariate distribution is the determinant of the covariance matrix  $\Sigma$ , called the "generalized variance" [1].

The generalized variance ratio or  $U$ -statistic, here tabulated, is the ratio of the likelihood estimate of the generalized residual variance assuming that the hypothesis is false to the likelihood estimate assuming that the hypothesis is true. The parameters for the  $U$ -statistic are the dimension  $p$  of the covariance matrix  $\Sigma$  and the degrees of freedom,  $q$  and  $n$ , for the hypothesis and error, respectively.

These unpublished tables, computed on an IBM 360 Model 40 system, consist of 6D values of  $U(p, q, n)$  for  $p = 1(1)8$ ,  $q = 1(1)15(3)30(10)40(20)120$ ,  $n = 1(1)30(10)40(20)140(30)200, 240, 320, 440, 600, 800, 1000$ , at confidence levels  $\alpha = 0.05$  and  $\alpha = 0.01$ , respectively.

As a partial check, recent 3D tables of Schatzoff [2] have been used by the author to recompute the  $U$ -statistic for  $p = 4(2)10$ ,  $q = 4$ ;  $p = 5(7)9$ ,  $q = 6$ ;  $p = 3, 7$ ,  $q = 8, 10$ . These results were found to agree to at least 3D with the corresponding data in the more extended tables under review, which are the most elaborate of this type thus far calculated.

J. W. W.

1. T. W. ANDERSON, *An Introduction to Multivariate Statistical Analysis*, John Wiley & Sons, New York, 1958.

2. MARTIN SCHATZOFF, "Exact distributions of Wilks's likelihood ratio criterion," *Biometrika*, v. 53, 1966, pp. 347-358.

**57[12].**—J. M. FOSTER, *List Processing*, American Elsevier Publishing Co., Inc., New York, 1967, 54 pp., 23 cm. Price \$4.50.

This is an excellent little book. It introduces the concepts of list-processing within a programming language which is an extension of ALGOL. This has the advantage that many of the techniques which are used in languages like LISP or IPL-V can be illustrated rather simply, and in a way which makes them easily accessible to the programmer who only knows ALGOL, or even FORTRAN. It has the slight disadvantage that the more innovative features of list-processing languages are lost, such as the lack of distinction between program and data in LISP, or the form of the replacement rule in SNOBOL.

The description of list-processing facilities is based mainly on LISP, both from the point-of-view of the user and of the implementer. Other established list-processing languages are also discussed.

The book reads very easily, but is by no means superficial, and would be very useful in an introductory course on programming or machine intelligence.

MALCOLM C. HARRISON

Courant Institute of Mathematical Sciences  
New York University  
New York, New York 10012

**58[12].**—JAMES T. GOLDEN & RICHARD M. LEICHUS, *IBM 360 Programming and Computing*, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1967, ix + 342 pp., 26 cm. Price \$5.50.

This recent entry to the steadily increasing ranks of IBM 360 programming texts