

The most extensive previously published tables of such eigenvalues are those of Carslaw and Jaeger [1], which extend to 4D, and which the present author found inadequate for his purposes.

J. W. W.

51[F, Z, X].—*Revue Française de Traitement de l'Information*, Dunod, Éditeur, Paris, 1965, 158 pp., 22 cm. Price 12 f.

This little magazine has three articles in French, an algorithm section, and a bulletin describing computing activities in France. The three articles are:

- (1) "Sur la résolution des programmes à solutions entières," M. Courtillot,
- (2) "Algorithms d'analyse syntaxique pour langages 'Context-Free'," M. Basseur and J. Cohen and
- (3) "Point de vue sur la programmation," G. Lettelier and J. Weber.

The last article, which is of wider interest than the other two, discusses a new language, MICMAC, for the CDC 3600. Before giving details of this language, the authors write an interesting discussion of various programming language entities and notions. Among these are compatibility, static vs. dynamic languages, assembly languages and algorithmic languages and notions such as conditional assembly and macro instructions. MICMAC itself appears to be a powerful macro language compiler with pseudo instructions for declaring arrays of various types. The authors claim that MICMAC facilitates the reprogramming problem by clarifying programs so that they can be easily understood.

The second article is the first part of a two part paper on context free syntactic analysis for compilers. After a section on theoretical aspects of the problem, different types of analyses and reviews of existing work on syntactic analysis, the authors develop the subject of top down analysis in fine detail and end part one of the paper with an ALGOL algorithm for such an analysis. The bibliography (mostly in English) on syntactic analysis and theory of languages is extensive and interesting in itself.

The first article, which is of comparatively restricted interest, describes a method which has already been the object of several notes published inside the Shell Company and has also been presented at the International Symposium on Mathematical Programming in London, 1964. If f is a numerical concave function in R^n and g a concave function from R^n into R^m , the method presented permits solution of programs of the type:

$$\max [f(x) \mid g(x) \geq 0, x \in Z^n].$$

The method of all-integer-programming of R. Gomory is a special case of this method when f and g are linear with integer components.

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52[G].—MARVIN MARCUS & HENRYK MINC, *Introduction to Linear Algebra*, The Macmillan Company, New York, 1965, x + 261 pp., 25 cm. Price \$7.95.

This book is intended to provide material for a one-semester course at the sophomore or junior level. There are sixteen sections grouped into three chapters: the first chapter develops the elementary notions including inversion; the second deals with rank and with determinants; the third, on characteristic roots, gives the Schur triangularization theorem, which is used as a basis for a brief discussion of normal matrices, and concludes with a section on inequalities, including Gershgorin circles, ovals of Cassini, and the minimax theorems for Hermitian matrices. The normal forms of Jordan and of Frobenius are not included. There are a large number of exercises, with 47 pages of answers and solutions at the end.

The development is rigorous, and a number of auxiliary notions, such as rings and fields, permutation groups, and the like, are introduced, but subordinated to the main objective. The book should be quite teachable, and even suitable for independent reading by the novice.

A. S. H.

53[G].—JEAN-MARIE SOURIAU, *Calcul Linéaire*, Second edition (in two volumes), Presses Universitaires de France, Paris, 1964 and 1965, Volume I, xv + 259 pp., 19 cm. Price 27 f; Volume II, xv + 263 pp., 19 cm. Price 30 f.

The first volume bears the subtitle "Méthodes mathématiques de la physique," and in the preface it is stated that this is a work of pure mathematics, intended for all those who have to apply linear algebra.

The development is rigorous and abstract, but accompanied throughout by figures and illustrative material, and by numerous exercises. Solutions for the exercises are given at the end of Volume II. Inevitably the notations and special terminology become rather involved, but an unusually detailed index, together with a list of symbols, are of great assistance.

The first volume gives the general theory. An initial chapter of about forty pages develops the notion of sets, operators, inversion groups, and the like; linear spaces and linear operators come in chapter two of not quite fifty pages. Next come matrices, then dimensionality, then a chapter of about seventy pages on multi-linear algebra with determinants, and finally a chapter on spectral properties of about thirty pages, that stops short of the Jordan normal form.

The second volume is given over to applications, beginning with the exponential and logarithm, but then going on to special spaces. Something over a hundred pages are devoted to "Euclidean and hermitian spaces": normal, hermitian, and anti-hermitian operators; orthogonality, unitary groups, the Lorentz group, to pick a few topics more or less at random. Finally there is a brief chapter on spaces of dimension 2, 3, and 4, and on spinors of Dirac.

There is very little direct reference to methods of computing. But the author is able to include quite a large amount of theory, and in general he succeeds very well in making intuitive his abstract approach.

A. S. H.

54[K, L, M].—T. KRISHNAN, *Table of Truncated Probits*, Indian Statistical Institute, Calcutta, 4 + 28 computer sheets, ms. deposited in UMT File.

This unpublished table is an elaboration of one appearing in a paper [1] by the