

The final chapter, Chapter five, is devoted to the principles of programming. Several illustrative problems are coded for an imaginary single-address machine. The problems of using a library of subroutines are discussed, as are the notions of relative addresses and floating addresses.

The bibliography given at the end of the book is not an extensive one. The oldest references in it are dated 1951. This is somewhat unfortunate, for the reader cannot gain any impression therefrom of the historical development of the subject. The omission of any reference to the fundamental work of von Neumann on computers is, to the reviewer, a great oversight.

A. H. T.

15[Z]. HERBERT D. LEEDS & GERALD M. WEINBERG, *Computer Programming Fundamentals*, McGraw-Hill Book Company Inc., New York, 1961, ix + 368 p., 23 cm. Price \$8.50.

Nominally an introductory textbook on digital computing techniques and applications, this book presents a readable account of the basic principles of programming and coding for a specific machine, namely, the IBM 7090 computer. No mathematical knowledge beyond elementary algebra is required. The first section delineates the fundamental characteristics and special capabilities of a computer and then highlights the preparatory steps required to obtain a machine solution. The longer second section is devoted to an exposition of flow-diagramming and coding for the IBM 7090 computer.

In view of the fact that the book is addressed to "students in business administration, economics, and other nontechnical fields as well as the physical sciences and mathematics courses", the authors are disappointingly vague on the subject of programming techniques and procedures for the solution of large-scale data processing problems. Such significant developments as business compilers (COBOL, IBM Commercial Translator, etc.), sort generators, and report generators are not even mentioned. The value of the book as a general text on computer fundamentals is further lessened by the omission of references and supplemental readings. Consequently, the reviewer believes that this volume will be primarily suitable as a general IBM 7090 programming manual for nontechnical readers. It is written in a lively, lucid style that can be easily comprehended by the layman.

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16[Z]. W. W. PETERSON, *Error-Correcting Codes*, The Technology Press and John Wiley & Sons, Inc., New York, 1961, x + 285 p., 24 cm. Price \$7.75.

The journal literature on algebraic coding theory has become so extensive lately that a book has been needed to give perspective and order to the field. This excellent book not only fills this need but also improves greatly on the presentation in many of the journal articles. In conjunction with the literature on probabilistic schemes of coding and decoding, Peterson's book gives an essentially complete

picture of coding theory as currently known. Most of the material does not appear elsewhere in book form, and a considerable amount is original.

The style of writing is remarkably successful in developing insight and intuition without appreciably sacrificing rigor or conciseness. The book is almost self-contained and includes a development of the required algebraic concepts and theorems. A discussion of ways to implement algebraic operations, particularly on polynomials and Galois field elements by shift register circuits, should help the engineer to understand and use modern algebra, both in coding theory and elsewhere.

The first part of the book discusses linear codes, which are group codes or parity-check codes generalized to include non-binary alphabets. This includes a general treatment, some theoretical bounds on error-correcting ability, and a discussion of several specific classes of linear codes. Next, after some mathematical development, the theory and implementation of cyclic codes is discussed from several different viewpoints.

Bose-Chaudhuri codes, which are the most important of the known algebraic codes, are elegantly treated after cyclic codes. A simple derivation of their error-correcting capabilities is given, and two decoding techniques are presented. The remainder of the book treats burst-error correction, other approaches to decoding, recurrent codes, and the checking of arithmetic operations.

The appendices include a table of irreducible polynomials over the field of two elements. They are arranged in order as minimum polynomials of the elements of Galois field, and this makes it possible to find generator polynomials for Bose-Chaudhuri codes almost by inspection.

The book is highly recommended to engineers and mathematicians interested in coding, information theory, communication, and computers.

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17[Z]. A. UNGAR, Proceedings Editor, *Proceedings of the 1959 Computer Applications Symposium*, sponsored by the Armour Research Foundation of Illinois Institute of Technology, Chicago, 1960, x + 155 p., 23 cm. Price \$3.00.

Like most symposia, this little book contains quite a variety of papers, some of them excellent, and some of them only mediocre. The paper entitled "Fortran Experience and Remote Operation by Non-computer Specialists" in conjunction with its subsequent panel discussion is, in the opinion of this reviewer, alone well worth the price of the book. This is by no means the only interesting paper. Each paper is followed by the type of bantering discussion that usually takes place in a meeting of a group of specialists.

The papers include: "Shareholder Record-Handling with the Aid of Character-Recognition Equipment," "Around the World in Eighty Columns," "Cost Reduction Through Integrated Data-Processing," "Some Aspects of Computer Technology in the USSR," "Experience and Plans for Marketing-Research Operations," "A Modern Approach to Inventory Control Utilizing a Large-Scale EDPM," "Current Developments in Common-Language Programming for Business Data Systems," "Linear Programming on the Bendix G-15 Computer," "The Design