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Book reviews

FUNdamental PROGRAMMING Concepts, by Jonathan L. Gross and Walter S. Brainherd, 1972; 304 pages. (*Harper and Row*, £4·15)

The emphasis on certain letters in the title of this book is deliberate: the authors make a real effort to show that programming is an enjoyable occupation. This reviewer, at any rate, is entirely in favour of any approach which will help to dispel the aura of mathematical mystique which still clings to computers and computer people, but he admits that some readers may find the treatment of the subject given in this book rather superficial. It appears to succeed in its aim of introducing the basic techniques of programming using a variety of computer applications for illustration. Many specimen programs are given, and for each the problem is clearly defined and a solution developed and carefully explained. All examples are well-punctuated by comments, the importance of data verification is stressed, and program efficiency is encouraged. In all, about one-sixth of the book is devoted to reproductions of listings of these examples, coded in BASIC, a description of the language being given in the first two chapters. Here is room for some slight criticism, since a great deal of attention is given to the command language and editing features of time-sharing systems, features which may be very different on the reader's system.

Chapter 3 contains a review of some techniques of file and record processing, together with a brief look at sorting and merging. The only sort mentioned is the 'bubble' method, and only the simplest two-way merge is dealt with. Subsequent chapters include a description of the string-handling facilities of BASIC and some interesting examples of simulation, selected from a number of unusual fields. Elementary numerical methods are discussed, and an amusing survey of some of the work being done under the general heading 'artificial intelligence' is included. Yet another hypothetical computer (the BRAIN) is introduced for a discussion of machine-level languages (the production of an assembler is left as an exercise for the reader!). A BASIC-coded simulator is supplied in an appendix. Other languages, notably SNOBOL, are mentioned in a chapter on programming languages.

A. S. RADFORD (Leicester)

Modern Data Communication, Concepts, Language and Media by William R. Davenport, 1972; 200 pages. (*Pitman Publishing*, £2·75)

Data communication has always had the problem that computer people are usually not interested in the communication side, while for the communication specialists computers and data communication are of a secondary concern. This book is useful for each of these two groups of people. While it is concerned almost entirely with communication, it treats specifically those problems of interest in data transmission applications. This treatment is comparatively low level; there is virtually no mathematics in the book. At times this is a pity. For example, otherwise good discussion of coding would have been better rounded by the inclusion of some of the mathematics of error detecting codes. The discussion of the characteristics of transmission media is particularly useful, especially as regards his discussion of multi-level data transmission. The discussion of the US commercial communications services available is extremely interesting. Of course all the complications described are due to their regulatory policies. It is a pity that the European edition of a book such as this could not have a comparative discussion on European data services.

Finally I would have welcomed some discussion of the newer digital data services being planned and commissioned both in the US and Europe. In the US some discussion of the new ATT digital service or Datran would have been interesting even if a consideration of packet switched services was felt to be beyond the scope of the book.

In spite of some of the above criticisms, this book is an extremely useful adjunct to the literature, both as a textbook and reference book. I trust that the book will have the success it deserves so that the author will produce a second edition somewhat expanded, covering some of the material suggested above.

P. T. KIRSTEIN (London)

An Introduction to Logical Design of Digital Circuits, by C. M. Reeves; 1972, 192 pages. (*Cambridge University Press*, £1·60) Cambridge Computer Science Texts No. 1

This is the first volume in a new series, the Cambridge Computer Science Texts, aimed at students taking Computer Science as a major field of study. The intention is to have a series at an appropriate level and at a price that students can afford. The present book succeeds on both counts and I hope that its followers in the series will do the same.

A brief introduction to switching and memory elements leads into a lengthy chapter entitled, accurately if somewhat baldly, Boolean Algebra. This covers a host of topics, leading up to functionally complete sets of operators and solution of simultaneous Boolean equations. The techniques displayed in this chapter are then employed in the next three, on design of combinational circuits, on sequential networks and on computer circuits respectively. For combinational circuits we have both AND-OR-NOT and NAND/NOR logic, as required by today's hardware technology. There is a careful treatment of simplification methods and redundancies. The chapter on computer circuits is very brief and only takes the student as far as the design of a parallel adder; anticipatory carry is hinted at but does not actually appear.

An appendix gives a description of an ALGOL program for the teaching of logical design, using standard elements. As the complete program text appears many teachers will be able to implement this on their local computing service machine, as a useful aid.

Throughout, the style is clear and easy to follow. There are plenty of interesting exercises, many of them with hints for solutions.

P. A. SAMET (London)