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# Book reviews

*PDP-11 Assembler Language Programming and Machine Organization*, by M. Singer, 1980; 178 pages. (*John Wiley*, £6·80)

This book is aimed at the reader who has no prior knowledge or experience of computers, but who wishes to 'enjoy the fullest range of communication with the machine by understanding its machine code'. While many would argue with the assumptions inherent in this aim, or indeed with the desirability of fulfilling it, the author covers his subject with an admirable clarity that does much to justify his viewpoint. By concentrating on the PDP-11 range, a thoroughly practical approach is adopted, and it is assumed that the reader has access to a PDP-11 installation on which to develop programs.

Chapter 1 introduces the PDP-11 computer system. It includes a discussion of the operating systems insofar as this is necessary to get a simple program to run. Unfortunately, despite the wise decision to narrow the book's focus to a single machine architecture, the diversity of Digital operating systems leaves the reader in considerable doubt as to how to accomplish simple tasks, and he is in danger of being overwhelmed at the outset. The author makes a valiant attempt, but inevitably fails to bring solid order to this quagmire.

Chapters 2 and 3 introduce a broad range of assembler language instructions as they are required in the process of developing working programs. The use of monitor calls for I/O is encouraged to enable real programs to be written at this stage, but a full treatment is deferred until Chapter 4. A structured approach to programming is introduced unobtrusively as a consequence of program function. This and subsequent chapters are written with a refreshing clarity, and painlessly achieve the objective of covering the entire range of instructions. The author has a useful, if slightly irritating habit of interposing a penetrating question, just as the reader's mind is glossing over a not quite obvious point. This is a real aid to fuller understanding.

Chapter 4 covers peripheral control starting with a brief, but adequate treatment of direct I/O, interrupts and UNIBUS operation. The use of monitor calls for handling storage devices is discussed, followed by an overview of their operation and control requirements. A section on memory management winds up the discussion of operating system function.

Each section of the book has a good range of exercises, though no sample solutions are provided. A description of floating point arithmetic is sensibly banished to an appendix, as is the use of the debugging tool ODT. In all, the book is a useful and readable introduction for both the newcomer to assembly language programming, and the specialist meeting the PDP-11 family for the first time.

I. M. C. SHAND (Kingston)

*Introduction to the Computer—An Integrated Approach*, by J. Frater and W. Holdrup, 1980; 449 pages. (*Prentice-Hall*, £11·65)

The book is intended primarily to be a text for use in a one-term introduction to data processing courses and possibly in courses on computers and society. It claims that its 'integrated approach' is unique. It is certainly an approach which I believe would work well in a teaching situation in which the aim was to give students a well rounded appreciation of computers and data processing. The essence of the approach lies in the format of each chapter, in which certain new technical concepts are described followed by a substantial section on applications and implications. Thus the student is able, as he builds up his knowledge of the computer, to see in parallel something of the applications and social implications of the concepts he has mastered. Each chapter opens with a statement of the main concepts, applications and implications which are covered in it together with a list of the new terminology which it introduces. Chapters conclude with a summary and a set of about 10 relevant exercises. The book is thus well structured for use as a course text or for self-study; the preface contains helpful suggestions for both teachers and students on how it might best be used.

While it does not attempt to go into the various technical concepts in depth (it is not aimed primarily at those wishing to pursue a career in data processing), the range of topics covered is sufficiently comprehensive to enable the reader to acquire (as stated in the preface) 'the much needed computer literacy which is almost a prerequisite for entering any field'. Chapters 1-4 are concerned with basic concepts, 5-8 with hardware, 9-11 with programming and software and 12-14 with advanced systems and future trends. No specific programming language is presented in the main text but short appendices on BASIC, COBOL, FORTRAN and Pascal provide sufficient information on these languages to enable the student to write simple complete programs in any of them. The last three chapters cover such important topics of the present time as teleprocessing, networks, data base systems and the microprocessor revolution.

The book is well and accurately produced, although some of the photographs are not helpful, and the author's style is readable if a little repetitive in parts. The use of cartoons here and there provides welcome light relief and some well chosen quotations give additional insight throughout the book.

One small but important criticism: I felt that the fundamental concept of the stored program was not adequately explained early enough; I would have expected this to have been included in the first chapter. In one or two places, e.g. the chapter on 'The computer and its heritage' the writing is very much from an American standpoint, but I do not believe this necessarily invalidates the book from being usable in a British situation. Despite the length of the book some topics mentioned, e.g. computer art, are not developed sufficiently to give any real insight into them. Another general criticism is that the book does not provide directly for any practical access to a computer and the reader would certainly need to have such experience for much of the material to come alive.

In summary this is a readable and usable text, providing an all round appreciation of computers and data processing. It should certainly succeed in debunking any misconceptions the reader may have had and generate in him a moderate and critical attention to computers and their applications, convincing him that the ubiquitous computer is simply a powerful tool which man may use for good or ill as he chooses. It is a large book, perhaps a little longer and more expensive than is ideal for its purpose, but has the advantage of being more up to date than many of the alternative texts currently available.

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