A Book on C: Programming in C (4th Edition)

By Al Kelley, Ira Pohl

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Now in its fourth edition, A Book on C retains the features that have made it a proven, best-selling tutorial and reference on the ANSI C programming language. This edition builds on the many existing strengths of the text to improve, update, and extend the coverage of C, and now includes information on transitioning to Java and C++ from C.Beginners and professional programmers alike will benefit from the numerous examples and extensive exercises developed to guide readers through each concept. Step-by-step dissections of program code illuminate the correct usage and syntax of C language constructs and reveal the underlying logic of their application. The clarity of exposition and format of the book make it an excellent reference on all aspects of C.Highlights of A Book on C, Fourth Edition: New and updated programming examples and dissections-the authors' trademark technique for illustrating and teaching language concepts.Recursion is emphasized with revised coverage in both the text and exercises.Multifile programming is given greater attention, as are the issues of correctness and type safety. Function prototypes are now used throughout the text.Abstract Data Types, the key concept necessary to understanding objects, are carefully covered.Updated material on transitioning to C++, including coverage of the important concepts of object-oriented programming.New coverage is provided on transitioning from C to Java.References to key programming functions and C features are provided in convenient tables.

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Editorial Review

From the Inside Flap

A Book on C conveys an appreciation for both the elegant simplicity and the power of this general-purpose programming language. By presenting interactive running programs from many application areas, this book describes the ANSI version of the C language. The complete language is presented in a step-by-step manner, along with many complete working programs.

Where appropriate, we discuss the differences between traditional C and ANSI C. (Traditional C still remains in wide use.) Dozens of example programs are available to illustrate each important language feature, and many tables summarize key information and provide easy access for later reference. Each chapter ends with a summary and exercises. The summary reviews key elements presented in the chapter, and the exercises augment and extend the text.

This book assumes a general-purpose knowledge of the C language. It is intended for use in either a first or second programming course. However, it can be readily used in conjunction with courses on topics such as comparative programming languages, computational linguistics, data structures, database systems, fractal geometry, graphics, numerical analysis, operating systems, programming methodology, and scientific applications. C is suitable for applications from each of these domains, and all features of C needed to code such applications are explained. This book is appropriate for a data structures course because advanced data structuring features such as enumeration types, unions, self-referential structures, and ragged arrays are discussed. For operating systems courses concerned with UNIX or Windows 95/NT, the book explores the file structure and systems routines that enable the C programmer to add to existing systems libraries and understand the C code underlying the operating system. For applications programming and scientific programming, there is discussion of how to write sample function libraries. Statistics, root finding, sorting, text manipulation, file handling, and game playing are all represented with working code.

New Java Section. In Chapter 14, "Moving from C to Java," we discuss how the C programmer can very naturally and easily begin programming in Java, a language of interest for work on the Internet. The Java programming language borrows ideas from both C and C++ and is designed to run in a machine- and system-independent manner. This makes it suitable for Internet work, such as writing applets for Web pages that get used by browsers. Because Java is an extension of C and C++, it is readily learned by the C programmer.

Complete ANSI C Language. Computer professionals will have access to a complete treatment of the language, including enumeration types, list processing, and the operating system interface. Chapter 1, "An Overview of C," presents an overview of the language. After reading this chapter, the professional will already be able to write C code. Since the chapters are self-contained, the knowledgeable reader can skip to particular sections as needed. Chapter 11, "Input/Output and the Operating System," gives a thorough introduction to the connections to the operating system. This information will benefit the professional systems programmer needing to use C to work within an MS-DOS or UNIX environment.

Interactive Environment. This book is written entirely with the modern interactive environment in mind. Experimentation is encouraged throughout. Keyboard and screen input/output is taken as the norm, and its attendant concerns are explained. Thus, the book is appropriate for users of small home and business computers as well as to users of large interactive systems. We assume that the reader will have access to an

interactive ANSI C system. During the writing of this book, we used a number of different C systems: various Borland and Microsoft compilers running on IBM-compatible Pentium machines, the GNU gcc compiler and native compilers running on various workstations from DEC, SGI, and Sun, and the C compiler that runs on the Cray supercomputer in San Diego.

Working Code. Our approach to describing the language is to use examples, explanation, and syntax. Working code is employed throughout. Small but useful examples are provided to describe important technical points. Small because small is comprehensible. Useful because programming is based on a hierarchy of building blocks and ultimately is pragmatic. The programs and functions described in the book can be used in actual systems. The authors' philosophy is that one should experiment and enjoy.

Dissections. We use highlighted "dissections" on many programs and functions throughout the book. Dissection is a unique pedagogical tool first developed by the authors in 1984 to illuminate key features of working code. A dissection is similar to a structured walk-through of the code. Its intention is to explain to the reader newly encountered programming elements and idioms found in working code.

Flexible Organization. This book is constructed to be very flexible in its use. Chapter 1, "An Overview of C," is in two parts. The first part explains the crucial programming techniques needed for interactive input/output, material that must be understood by all. The second part of Chapter 1 goes on to survey the entire language and will be comprehensible to experienced programmers familiar with comparable features from other languages. This second part can be postponed in a first programming course. Caution: Beginning programmers should postpone the second part of Chapter 1.

Chapter 2, "Lexical Elements, Operators, and the C System," describes the lexical level of the language and syntactic rules, which are selectively employed to illustrate C language constructs. The instructor may decide to teach Backus-Naur-Form (BNF) notation as described in Chapter 2 or may omit it without any loss of continuity. The book uses BNF style syntactic descriptions so that the student can learn this standard form of programming language description. In addition, language components are thoroughly described by example and ordinary explanation.

Reference Work. This book is designed to be a valuable reference to the C language. Throughout the book, many tables concisely illustrate key areas of the language. The complete ANSI C standard library, along with its associated header files, is described in the Appendix A, "The Standard Library." Sections in the appendix are devoted to explaining each of the standard header files such as ctype.h, stdio.h, and string.h. Where appropriate, example code is given to illustrate the use of a particular construct or function.

In Appendix B, "Language Syntax," we provide the complete syntax of the C language. In Appendix C, "ANSI C Compared to Traditional C," we list the major differences between ANSI C and traditional C. Finally, special care has been taken to make the index easy to use and suitable for a reference work.

The Complete ANSI C Language. Chapters 3 through 10 cover the C language feature by feature. Many advanced topics are discussed that may be omitted on first reading without loss of comprehension, if so desired. For example, enumeration types are relatively new to the language, and their use can be omitted in a first course. Machine-dependent features such as word size considerations and floating-point representation are emphasized, but many of the details need not concern the beginner.

The Preprocessor. Chapter 8, "The Preprocessor," is devoted entirely to the preprocessor, which is used to extend the power and notation of the C language. Macros can be used to generate inline code that takes the place of a function call. Their use can reduce program execution time. The chapter presents a detailed discussion of the preprocessor, including new features added by the ANSI committee. In traditional C, the preprocessor varies considerably from one compiler to another. In ANSI C, the functionality of the

preprocessor has been completely specified.

Recursion and List Processing. Chapter 5, "Functions," has a careful discussion of recursion, which is often a mystifying topic for the beginner. The use of recursion is illustrated again in Chapter 8, "The Preprocessor," with the quicksort algorithm and in Chapter 10, "Structures and List Processing," with basic list processing techniques. A thorough knowledge of list processing techniques is necessary in advanced programming and data structure courses.

Operating System Connection. Chapter 11, "Input/Output and the Operating System," makes the operating system connection. In this chapter, we explain how to do file processing and discuss at length the various input/output functions in the standard library. We also explain how to execute a system command from within a C program and how to set file permissions and use of environment variables. We give explicit examples showing the use of the profiler, the librarian, and the make facility.

Advanced Applications. We discuss a number of advanced applications in Chapter 12, "Advanced Applications." We present topics such as creating concurrent processes, overlaying a process, interprocess communication, and sig

From the Back Cover

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Ira Pohl is a Professor of Computer Science at the University of California, Santa Cruz and holds a Ph.D. in Computer Science from Stanford University. His research interests include artificial intelligence, the C and C++ programming languages, practical complexity problems, heuristic search methods, deductive algorithms, and educational and social issues. He originated error analysis in heuristic search methods and deductive algorithms. Professor Pohl was formerly a Mackay professor at University of California- Berkeley and a ZWO fellow in the Netherlands. He is the author or co-author of *Object-Oriented Programming Using C++*, *C++ Distilled: A Concise Ansi/Iso Reference and Style Guide*, *C by Dissection: The Essentials of C Programming*, *A Book on C: Programming in C, C++ for C Programmers*, *C++ for Fortran Programmers*, *C++ for Pascal Programmers*, and *Turbo C: The Essentials of C Programming*, all published by Addison-Wesley.

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question since just their can do that. It said that about book. Book is familiar on every person. Yes, it is proper. Because start from on jardín de infancia until university need this A Book on C: Programming in C (4th Edition) to read.

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