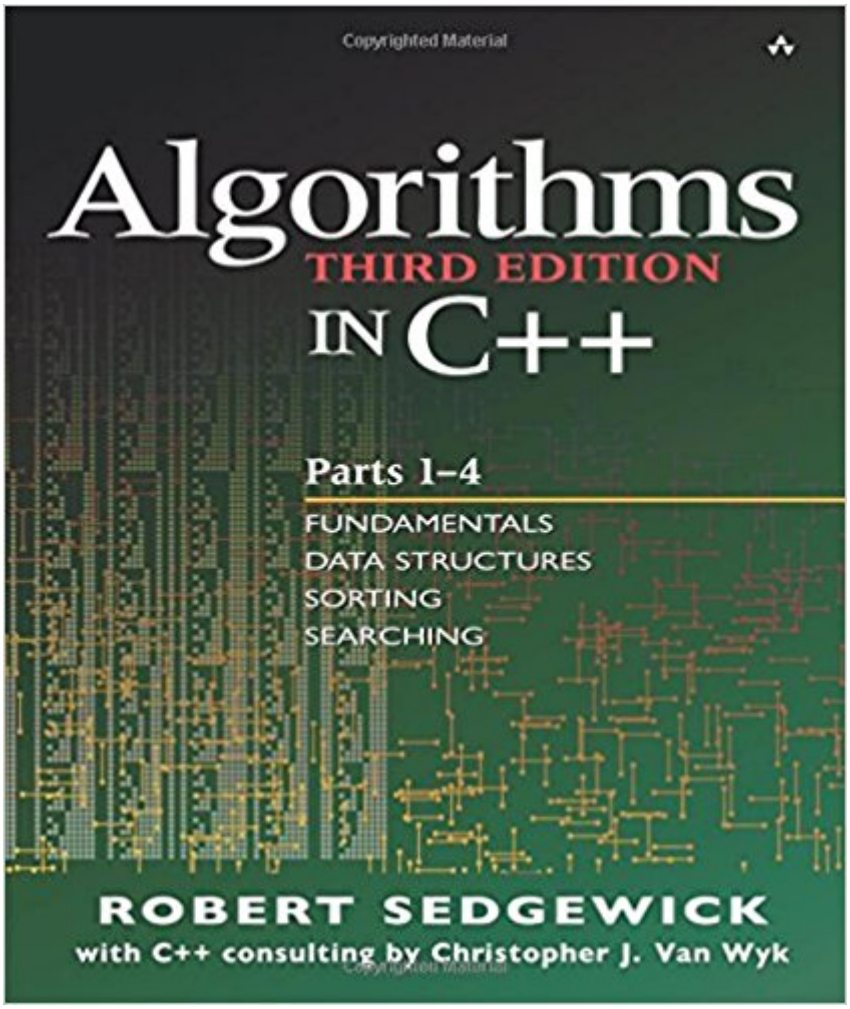
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Algorithms In C++, Parts 1-4: Fundamentals, Data Structure, Sorting, Searching, Third Edition



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Synopsis

Robert Sedgewick has thoroughly rewritten and substantially expanded and updated his popular work to provide current and comprehensive coverage of important algorithms and data structures. Christopher Van Wyk and Sedgewick have developed new C++ implementations that both express the methods in a concise and direct manner, and also provide programmers with the practical means to test them on real applications. Many new algorithms are presented, and the explanations of each algorithm are much more detailed than in previous editions. A new text design and detailed, innovative figures, with accompanying commentary, greatly enhance the presentation. The third edition retains the successful blend of theory and practice that has made Sedgewick's work an invaluable resource for more than 250,000 programmers! This particular book, Parts 1n4, represents the essential first half of Sedgewick's complete work. It provides extensive coverage of fundamental data structures and algorithms for sorting, searching, and related applications. Although the substance of the book applies to programming in any language, the implementations by Van Wyk and Sedgewick also exploit the natural match between C++ classes and ADT implementations. Highlights Expanded coverage of arrays, linked lists, strings, trees, and other basic data structures Greater emphasis on abstract data types (ADTs), modular programming, object-oriented programming, and C++ classes than in previous editions Over 100 algorithms for sorting, selection, priority queue ADT implementations, and symbol table ADT (searching) implementations New implementations of binomial queues, multiway radix sorting, randomized BSTs, splay trees, skip lists, multiway tries, B trees, extendible hashing, and much more Increased quantitative information about the algorithms, giving you a basis for comparing them Over 1000 new exercises to help you learn the properties of algorithms Whether you are learning the algorithms for the first time or wish to have up-to-date reference material that incorporates new programming styles with classic and new algorithms, you will find a wealth of useful information in this book.

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Customer Reviews

This book is intended to survey the most important computer algorithms in use today, and to teach fundamental techniques to the growing number of people in need of knowing them. It can be used as a textbook for a second, third, or fourth course in computer science, after students have acquired basic programming skills and familiarity with computer systems, but before they have taken specialized courses in advanced areas of computer science or computer applications. The book also may be useful for self-study or as a reference for people engaged in the development of computer systems or applications programs, since it contains implementations of useful algorithms and detailed information on these algorithms' performance characteristics. The broad perspective taken makes the book an appropriate introduction to the field. I have completely rewritten the text for this new edition, and I have added more than a thousand new exercises, more than a hundred new figures, and dozens of new programs. I have also added detailed commentary on all the figures and programs. This new material provides both coverage of new topics and fuller explanations of many of the classic algorithms. A new emphasis on abstract data types throughout the book makes the programs more broadly useful and relevant in modern programming environments. People who have read old editions of the book will find a wealth of new information throughout; all readers will find a wealth of pedagogical material that provides effective access to essential concepts. Due to the large amount of new material, we have split the new edition into two volumes (each about the size of the old edition) of which this is the first. This volume covers fundamental concepts, data structures, sorting algorithms, and searching algorithms; the second volume covers advanced algorithms and applications, building on the basic abstractions and methods developed here. Nearly all the material on fundamentals and data structures in this edition is new. This book is not just for programmers and computer-science students. Nearly everyone who uses a computer wants it to run faster or to solve larger problems. The algorithms in this book represent a body of knowledge developed over the last 50 years that has become indispensible in the efficient use of the computer, for a broad variety of applications. From N-body simulation problems in physics to genetic-sequencing problems in molecular biology, the basic methods described here have become

essential in scientific research; and from database systems to Internet search engines, they have become essential parts of modern software systems. As the scope of computer applications becomes more widespread, so grows the impact of many of the basic methods covered here. The goal of this book is to serve as a resource for students and professionals interested in knowing and making intelligent use of these fundamental algorithms as basic tools for whatever computer application they might undertake. Scope The book contains 16 chapters grouped into four major parts: fundamentals, data structures, sorting, and searching. The descriptions here are intended to give readers an understanding of the basic properties of as broad a range of fundamental algorithms as possible. The algorithms described here have found widespread use for years, and represent an essential body of knowledge for both the practicing programmer and the computer-science student. Ingenious methods ranging from binomial queues to patricia tries are described, all related to basic paradigms at the heart of computer science. The second volume consists of four additional parts that cover strings, geometry, graphs, and advanced topics. My primary goal in developing these books has been to bring together the fundamental methods from these diverse areas, to provide access to the best methods known for solving problems by computer. You will most appreciate the material in this book if you have had one or two previous courses in computer science or have had equivalent programming experience: one course in programming in a high-level language such as C++, Java, or C, and perhaps another course that teaches fundamental concepts of programming systems. This book is thus intended for anyone conversant with a modern programming ivlanguage and with the basic features of modern computer systems. References that might help to fill in gaps in your background are suggested in the text. Most of the mathematical material supporting the analytic results is self-contained (or is labeled as beyond the scope of this book), so little specific preparation in mathematics is required for the bulk of the book, although mathematical maturity is definitely helpful. Use in the Curriculum There is a great deal of flexibility in how the material here can be taught, depending on the taste of the instructor and the preparation of the students. There is sufficient coverage of basic material for the book to be used to teach data structures to beginners, and there is sufficient detail and coverage of advanced material for the book to be used to teach the design and analysis of algorithms to upper-level students. Some instructors may wish to emphasize implementations and practical concerns; others may wish to emphasize analysis and theoretical concepts. I am developing a variety of course materials for use with this book, including slide masters for use in lectures, programming assignments, homework assignments and sample exams, and interactive exercises for students. An elementary course on data structures and algorithms might emphasize the basic

data structures in Part 2 and their use in the implementations in Parts 3 and 4. A course on design and analysis of algorithms might emphasize the fundamental material in Part 1 and Chapter 5, then study the ways in which the algorithms in Parts 3 and 4 achieve good asymptotic performance. A course on software engineering might omit the mathematical and advanced algorithmic material, and emphasize how to integrate the implementations given here into large programs or systems. A course on algorithms might take a survey approach and introduce concepts from all these areas. Earlier editions of this book have been used in recent years at scores of colleges and universities around the world as a text for the second or third course in computer science and as supplemental reading for other courses. At Princeton, our experience has been that the breadth of coverage of material in this book provides our majors with an introduction to computer science that can be expanded upon in later courses on analysis of algorithms, systems programming and theoretical computer science, while providing the growing group of students from other disciplines with a large set of techniques that these people can immediately put to good use. The exercises--most of which are new to this edition--fall into several types. Some are intended to test understanding of material in the text, and simply ask readers to work through an example or to apply concepts described in the text. Others involve implementing and putting together the algorithms, or running empirical studies to compare variants of the algorithms and to learn their properties. Still others are a repository for important information at a level of detail that is not appropriate for the text. Reading and thinking about the exercises will pay dividends for every reader. Algorithms of Practical Use Anyone wanting to use a computer more effectively can use this book for reference or for self-study. People with programming experience can find information on specific topics throughout the book. To a large extent, you can read the individual chapters in the book independently of the others, although, in some cases, algorithms in one chapter make use of methods from a previous chapter. The orientation of the book is to study algorithms likely to be of practical use. The book provides information about the tools of the trade to the point that readers can confidently implement, debug, and put to work algorithms to solve a problem or to provide functionality in an application. Full implementations of the methods discussed are included, as are descriptions of the operations of these programs on a consistent set of examples. Because we work with real code, rather than write pseudo-code, you can put the programs to practical use quickly. Program listings are available from the book’s home page. You can use these working programs in many ways to help you study algorithms. Read them to check your understanding of the details of an algorithm, or to see one way to handle initializations, boundary conditions, and other awkward situations that often pose programming challenges. Run vithem to see the algorithms in action, to study performance

empirically and check your results against the tables in the book, or to try your own modifications. When appropriate, empirical and analytic results are presented to illustrate why certain algorithms are preferred. When interesting, the relationship of the practical algorithms being discussed t

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One of my favorite CS books.

Good book but key details are not clearly covered.

Great reference for C++ devs.

super helpful. I wish I bought it a lot earlier. His explanations before the codes are wonderful. The codes that follow are easy to understand.

If you are studying data structures, especially a beginner's course, this one is a very handy, useful reference/text book. Highly recommend!

I purchased this book to refresh my memory on data structures with templates. It is well written in most spots and provides excellent examples. I would recommend this book to any intermediate c++ programmer who wishes to learn/relearn advanced data structures such as Linked Lists,Hash,QuickSort,etc....

I admit that I haven't spent too much time exploring this text, but it's tried and tested. I bought it in order to supplement my C++ data structures book. I soon used it as my class text with my notes. The code seems to work (again, I haven't done any major testing on it), and it helped me out a lot in the class. There may be better texts on this subject, but Sedgewick's is very good.

I have the printed version also and I would give the content of the book 5 stars.However, the kindle version is a poor implementation. Absolutely zero work has been put into adapting it for a tablet.Many images are too large and fit awkwardly on the split page view, which gets me to another issue of the Kindle application on Android : the default landscape orientation and two pages per screen is absolutely stupid. It might work for Snow White, Twilight Saga and the like, but not for complicated, technical books. There is simply too few information in one screen and, if this isn't bad enough, the very lazy practice of just dumping your publishing digital version of the book into whatever format Kindle uses internally, without any regard to layout issues, image size, placement and quality, makes a for a very poor product overall. I'm sorry, but I can't separate the book from the reader.This was my first kindle book and, after I purchased another to find out in horror that the images are not even scaled, resulting in some pixelated crap that you can barely make out in the context where the pixelated crap are suppose to be somewhat complicated diagrams means I am looking for alternative services.Until decides to ditch the pocketbook format for their Android app and allow portrait orientation with one page per view, a handy 'go to index' button in the interface, instead of having to wait for the menu bar to show up, click, click, click, again in the context of technical books where you jump back and forth very often, until then I will not purchase another

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