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Algorithms (4th Edition)

ROBERT SEDGEWICK | KEVIN WAYNE
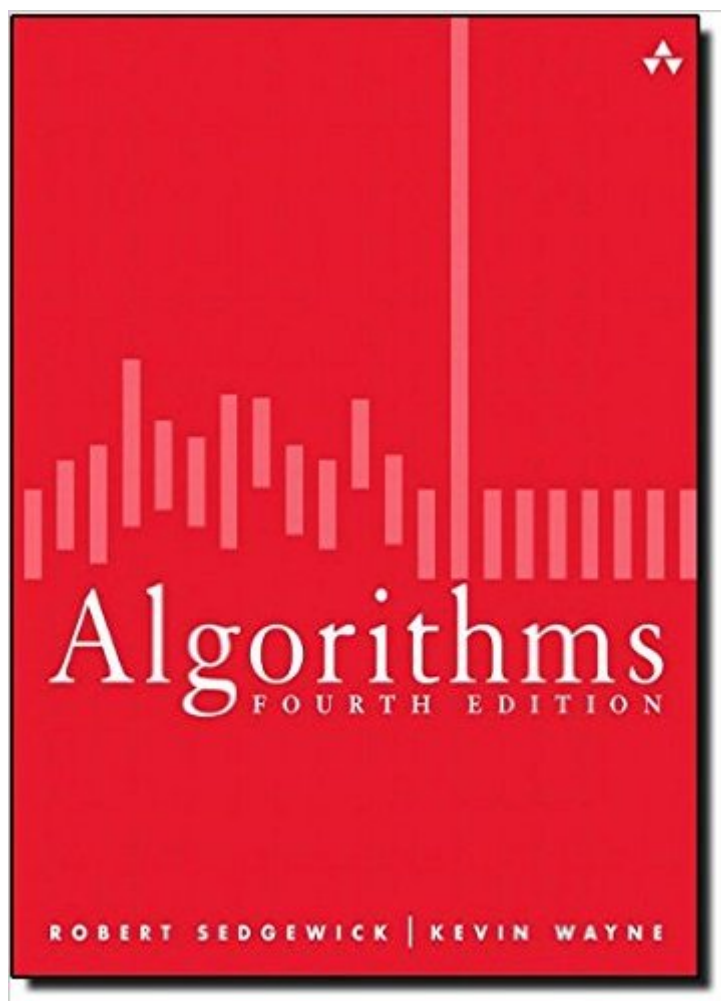
Synopsis

This fourth edition of Robert Sedgewick and Kevin Wayneâ ™s Algôrithms is the leading textbook on algorithms today and is widely used in colleges and universities worldwide. This book surveys the most important computer algorithms currently in use and provides a full treatment of data structures and algorithms for sorting, searching, graph processing, and string processing--including fifty algorithms every programmer should know. In this edition, new Java implementations are written in an accessible modular programming style, where all of the code is exposed to the reader and ready to use. Â The algorithms in this book represent a body of knowledge developed over the last 50 years that has become indispensable, not just for professional programmers and computer science students but for any student with interests in science, mathematics, and engineering, not to mention students who use computation in the liberal arts. Â The companion web site, algs4.cs.princeton.edu, contains   An online synopsis Full Java implementations Test data Exercises and answers Dynamic visualizations Lecture slides Programming assignments with checklists Links to related material   The MOOC related to this book is accessible via the "Online Course" link at algs4.cs.princeton.edu. The course offers more than 100 video lecture segments that are integrated with the text, extensive online assessments, and the large-scale discussion forums that have proven so valuable. Offered each fall and spring, this course regularly attracts tens of thousands of registrants. Â Robert Sedgewick and Kevin Wayne are developing a modern approach to disseminating knowledge that fully embraces technology, enabling people all around the world to discover new ways of learning and teaching. By integrating their textbook, online content, and MOOC, all at the state of the art, they have built a unique resource that greatly expands the breadth and depth of the educational experience.

Book Information

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Robert Sedgewick has been a Professor of Computer Science at Princeton University since 1985, where he was the founding Chairman of the Department of Computer Science. He has held visiting research positions at Xerox PARC, Institute for Defense Analyses, and INRIA, and is member of the board of directors of Adobe Systems. Professor Sedgewickâ ™s research interests include analytic combinatorics, design and analysis of data structures and algorithms, and program visualization. His landmark book, Algorithms, now in its fourth edition, has appeared in numerous versions and languages over the past thirty years. In addition, with Kevin Wayne, he is the coauthor of the highly acclaimed textbook, Introduction to Programming in Java: An Interdisciplinary Approach (Addison-Wesley, 2008). Â Kevin Wayne is the Phillip Y. Goldman Senior Lecturer in Computer Science at Princeton University, where he has been teaching since 1998. He received a Ph.D. in operations research and industrial engineering from Cornell University. His research interests include the design, analysis, and implementation of algorithms, especially for graphs and discrete optimization. With Robert Sedgewick, he is the coauthor of the highly acclaimed textbook, Introduction to Programming in Java: An Interdisciplinary Approach (Addison-Wesley, 2008).

The book is about algorithms and data structures in Java, and not about learning to program. My review will contrast this book with Sedgewick's 25+year old "Algorithms in C++" in my shelf. The new algorithms book is such a vast improvement over the old C++ book that I hardly recognize it any more. The new Algorithms has two authors. The authors are using a sub-set of the Java OO features (unlike the C++ version, which used none). While I may not agree in detail with some choices, I can understand, because they explained their coding standards well, and why they limit features. The algorithms are updated to the basic algorithms a student these days needs to have heard of, which includes new material like tries. I was fascinated to see a regular expression evaluation automaton in code, with explanations. Some more esoteric material from the C++ book (for instance, Voronoi diagrams) is left for specialized books. At a few places in the book, the impact of algorithms and data structures is illustrated giving real-world examples. And I have yet to read chapter 6.But what really impressed me was the code. This book shows the fundamental data structures and algorithms in just a few lines of beautiful and well-thought code. Sure, any nit-picker

may find quibbles, but most choices are understandable from a didactic and printing perspective. This code is so much better than any in the old C++ book. The authors preferred clarity, yet the code is still concise. The authors are clear about feature creep, and limit their code to what is needed and no more, though some extensions are part of the exercises. I am reminded of the Einstein paraphrase "As simple as possible, but no simpler".More complex data structures and algorithms need multiple code boxes, which are all explained in detail, with the box appearing close to the explanation. Some readers may take issue with the density of information in examples, but I find it advantageous to have all information close-by rather than spread out. I prefer to pore over their dense examples than having to flip pages.

I bought this for Tim Roughgarden's Coursera course at Stanford - I found it really useful with good examples of algorithms, clear documentation and analytical insights. After I'd ordered it, I found we already had an earlier edition, but it's worth getting the latest version.

Integrated approach to learn algorithms. All the algorithms are in Java, it has a great website and code and data are in perfect sync with examples, plumbing code is in a library jar file, explanations are crystal clear. A perfect book!

Cannot find a better Introduction to Algorithm. My profession is software development related and I always learn something new whenever I refresh my 'data structure' skills from this book.Great arrangement of topics. Cannot find a better technique in writing the algorithm in Java.

I just love the book and admire Robert Sedgewick.. He will be my inspiration to learn all about algorithms...The great thing about the book is it has working implementations and we cannot make the explanation any simpler.It makes you wonder how can there be such a few lines of code to accomplish any task..It is a must read book for any software professional not just the people looking for jobs.. It increases you understanding and knowledge of which algorithm to use when..

The authors provide an clear and concise set of criterion for the use of algorithms in general, and then go about developing the basic set to use in daily development of your own. I got this book as a reference to assist newcomers and interns in their progress, but find myself referring to its contents frequently to remind myself of some foundational elements that have floated merrily away over the years.I would heartily recommend this book to everyone. For the student to learn the basic set of

algorithms, for the entry and mid level software engineers (or programmers) to inspire new ideas from a solid foundation, and for us veterans as a reminder to a solid way for development of our own algorithms.It is well written, and easy to understand (even for the interns I've had read through it). The examples are developed around Java, and so the book starts with a section on Java and basic programming techniques. It contains a large set of the basic algorithms that are frequently necessary on a day to day basis, but also shows HOW and WHY they were developed. It also provides a section on several advanced topics, again with an eye to the HOWs and WHYs. All along the way, there are references to "Good" development foundations, and reminders the development philosophies.

What is this book?This book is a practical introduction to fundamental computer science algorithms, it also includes real world applications of all algorithms, and last but not least, it includes actual Java code that implements all the algorithms & data structures, for some subjects, even real-world applications of the algorithms are also coded in Java.How is it different to other Algorithm books?Its not overly scientific, the book's chapters are not filled entirely with mathematical demonstrations, don't get me wrong, it does provide formal proof of the algorithms, but that is just a small part of each chapter.Most of each chapter's focus is on explaining what each algorithm does and its advantages and disadvantages. Each chapter and section explains an algorithm with actual Java code or well thought images and graphs.Finally, each section of the book has exercises for the reader to solve which help cement the knowledge learned in each section, in reality, I'd say that reading each section is only about 50% of what is necessary to obtain the skills to apply each algorithm or data structure in real-world scenarios. You must also solve the exercises in order to be able to use this book's knowledge in real life.I've read a big chunk of this book and I've coded a lot of the book's exercises in Ruby ([...]).

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