



R Data Structures and Algorithms

By Dr. PKS Prakash, Achyutuni Sri Krishna Rao



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Increase speed and performance of your applications with efficient data structures and algorithms

About This Book

- See how to use data structures such as arrays, stacks, trees, lists, and graphs through real-world examples
- Find out about important and advanced data structures such as searching and sorting algorithms
- Understand important concepts such as big-o notation, dynamic programming, and functional data structured

Who This Book Is For

This book is for R developers who want to use data structures efficiently. Basic knowledge of R is expected.

What You Will Learn

- Understand the rationality behind data structures and algorithms
- Understand computation evaluation of a program featuring asymptotic and empirical algorithm analysis
- Get to know the fundamentals of arrays and linked-based data structures
- Analyze types of sorting algorithms
- Search algorithms along with hashing
- Understand linear and tree-based indexing
- Be able to implement a graph including topological sort, shortest path problem, and Prim's algorithm
- Understand dynamic programming (Knapsack) and randomized algorithms

In Detail

In this book, we cover not only classical data structures, but also functional data structures.

We begin by answering the fundamental question: why data structures? We then move on to cover the relationship between data structures and algorithms, followed by an analysis and evaluation of algorithms. We introduce the fundamentals of data structures, such as lists, stacks, queues, and dictionaries, using real-world examples. We also cover topics such as indexing, sorting, and searching in depth.

Later on, you will be exposed to advanced topics such as graph data structures, dynamic programming, and randomized algorithms. You will come to appreciate the intricacies of high performance and scalable programming using R. We also cover special R data structures such as vectors, data frames, and atomic vectors.

With this easy-to-read book, you will be able to understand the power of linked lists, double linked lists, and circular linked lists. We will also explore the application of binary search and will go in depth into sorting algorithms such as bubble sort, selection sort, insertion sort, and merge sort.

Style and approach

This easy-to-read book with its fast-paced nature will improve the productivity of an R programmer and improve the performance of R applications. It is packed with real-world examples.

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Editorial Review

About the Author

Dr. PKS Prakash has pursued his PhD in industrial and system engineering at Wisconsin-Madison, US. He defended his second PhD in engineering from University of Warwick, UK. He has provided data science support to numerous leading companies in healthcare, manufacturing, pharmaceutical, and e-commerce domains on a wide range of business problems related to predictive and prescriptive modeling, virtual metrology, predictive maintenance, root cause analysis, process simulations, fraud detection, early warning systems, and so on. Currently, he is working as the Vice President and Practice Lead for data science at Dream11. Dream11 offers the world's largest fantasy cricket, football, and kabaddi games of skill. He has published widely in research areas of operational research and management, soft computing tools, and advanced algorithms in the manufacturing and healthcare domains in leading journals such as IEEE-Trans, EJOR, and IJPR, among others. He has contributed a chapter in Evolutionary Computing in Advanced Manufacturing and edited an issue of Intelligent Approaches to Complex Systems.

Achyutuni Sri Krishna Rao has an MS in enterprise business analytics (data science) from National University of Singapore. He has worked on a wide range of data science problems in the domain of manufacturing, healthcare and pharmaceuticals. He is an R enthusiast and loves to contribute to the open source community. His passions include freelancing, technical blogs (<http://rcodeeasy.blogspot.com>) and marathon runs. Currently he works as a data science consultant at a leading consulting firm.

Users Review

From reader reviews:

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