



## ADTs, Data Structures, and Problem Solving with C++ (2nd Edition)

By Larry R. Nyhoff

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Larry R. Nyhoff

Reflecting the newest trends in computer science, new and revised material throughout the Second Edition of this book places increased emphasis on abstract data types (ADTs) and object-oriented design. This book continues to offer a thorough, well-organized, and up-to-date presentation of essential principles and practices in data structures using C++. Topics include C++'s I/O and string classes, pointers and dynamic allocation, lists, array-based and linked-list implementations of stacks, queues, searching, inheritance and more. For computer professionals in companies that have computing departments or those who want advanced training in C++.

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**Bibliography**

- Sales Rank: #489573 in Books
- Published on: 2004-08-05
- Ingredients: Example Ingredients
- Original language: English
- Number of items: 1
- Dimensions: 9.20" h x 2.30" w x 7.00" l, 3.70 pounds
- Binding: Paperback
- 1072 pages

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### Editorial Review

From the Back Cover

Abstract data types (ADT's) and data structures are key elements in unlocking the power of object-oriented programming. Designed for CS2 course; this popular book thoroughly covers ADTs (Abstract Data Types), data structures, and their use in problem solving. The text guides the student through the development of ADTs such as stacks, queues, and binary trees, the use of key data structures such as arrays, classes and linked lists to implement ADTs, and problem solving using Object-Oriented Design (OOD) methodologies. Algorithms required to design and implement ADTs in C++ are given thorough treatment along with a solid introduction to the Standard Template Library (STL). C++ topics such as recursion, inheritance, and polymorphism are introduced and some C-style topics relative to data structures are also provided. Using examples, case studies and exercises from various areas of computer science, author Larry Nyhoff offers the student a solid foundation for further studies in CS while providing concrete tools for unlocking the power of C++.

### New to the Second Edition

- New chapters on searching and C++'s I/O and string classes
- Improvements and additions to diagrams
- Consistent naming conventions
- Complete source code for ADTs
- Expanded treatment of selected topics on the text's website
- Introduces UML and uses UML-style diagrams for ADT specifications

About the Author

**Larry B. Nyhoff** earned the B.A. in Mathematics in 1960 from Calvin College and the M.S. in 1961 from the University of Michigan. Larry continued his study of Mathematics and received the Ph.D. in 1969 from Michigan State University. He also did graduate work in computer science from 1981-83. He is in his 41st year as a professor at Calvin College and has aided in the development of the college's computer science curriculum since its inception. In addition to authoring and coauthoring nearly 30 textbooks used worldwide, Larry is a professional member of ACM and SIGCSE. He was selected to be the 2001-02 recipient of Calvin College's Presidential Exemplary Teaching Award.

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The first edition of this text grew out of the author's experience teaching an introductory data structures course (commonly referred to as CS2) for nearly two decades. It has served as a sequel to the widely used *C++: An Introduction to Computing* by Joel Adams and Larry Nyhoff, which grew out of their many years of teaching a first programming course (CS1) in C++. But computer science curricula change as do teaching pedagogy and methodology. In keeping with these changes, the introductory C++ text underwent revisions and has recently appeared in a third edition.

The content of the second course in computing also has changed, with the broadening of the traditional study of data structures to a study of abstract data types (ADTs) being one of the major trends. Consequently, there

is an increased emphasis on ADTs in this new edition and a name change thus seemed appropriate: *ADTs, Data Structures, and Problem Solving with C++*. And as one might expect, there is a corresponding increased emphasis on object-oriented design.

In addition, the author's pedagogy has been honed over many years of successful teaching. Reflecting this, the presentation in this new edition has been improved by reordering some topics, rewriting several sections, and adding new material. Many suggestions also came from those who diligently and thoroughly reviewed the manuscript and its several revisions. Their constructive comments and positive evaluations were very encouraging and much appreciated.

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