

Object Oriented Data Structures Using Java

Data structures play a key role in any serious development project, determining how the program acquires, stores, updates, and processes its in-memory data. Many of the basic techniques for constructing and governing access to data structures are well-documented, but most are structured programming techniques that do not translate well in an object-oriented environment. Object-Oriented C++ Data Structures for Real Programmers corrects this imbalance, teaching experienced C++ and Java developers the most effective methods for designing and implementing highly functional data structures in any type of object-oriented programming effort. The first part of the book introduces the various approaches, focusing on the purposes for which each is most suited. From there, the author examines advanced functionality that can be achieved in a number of ways, helping readers choose and apply the optimal technique. Key Features * Advanced coverage from an accomplished developer and programming author * Written explicitly for experienced object-oriented programmers * Helps you choose the best way to build the desired functionality, then provides the instruction you need to do it * Covers all major data structure approaches, including arrays, vectors, lists,

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stacks, and queues * Explains how to achieve a wide range of functionality, including data sorting, searching, hashing, dictionaries, and indexes

Based on the authors' market leading data structures books in Java and C++, this book offers a comprehensive, definitive introduction to data structures in Python by authoritative authors. *Data Structures and Algorithms in Python* is the first authoritative object-oriented book available for Python data structures. Designed to provide a comprehensive introduction to data structures and algorithms, including their design, analysis, and implementation, the text will maintain the same general structure as *Data Structures and Algorithms in Java* and *Data Structures and Algorithms in C++*. Begins by discussing Python's conceptually simple syntax, which allows for a greater focus on concepts. Employs a consistent object-oriented viewpoint throughout the text. Presents each data structure using ADTs and their respective implementations and introduces important design patterns as a means to organize those implementations into classes, methods, and objects. Provides a thorough discussion on the analysis and design of fundamental data structures. Includes many helpful Python code examples, with source code provided on the website. Uses illustrations to present data structures and algorithms, as well as their analysis, in a clear, visual manner. Provides hundreds of exercises that

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promote creativity, help readers learn how to think like programmers, and reinforce important concepts. Contains many Python-code and pseudo-code fragments, and hundreds of exercises, which are divided into roughly 40% reinforcement exercises, 40% creativity exercises, and 20% programming projects.

This introduction to the Java language integrates a discussion of object-oriented programming with the design and implementation of data structures. It covers the most important topics, including algorithm analysis; time and space complexities; Java built-in data structure classes; input and output, data, and access streams; and the persistency of data.

Provides technical information about current and future issues relating to search data structures used to index large object-oriented databases, for people involved with developing such databases or applications to be used on top of them, or with tuning the performance of application-dependent databases. Assumes a working knowledge of object-oriented modeling and programming concepts and at least a little of algebraic concepts such as sets.

Discusses the underlying database model, technical issues of search data structures, type hierarchy indexing, aggregation path indexing, the speedup of collection operations, and performance analysis.

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Written in an engaging and informal style, *Data Structures Using Java* facilitates a student's transition from simple programs in the first semester introductory programming course to more sophisticated, efficient, and effective programs in the second semester Data Structures course. Without delving too deeply into the details of Java, the author emphasizes the importance of effective organization and management of data and the importance of writing programs in a modern, object-oriented style. Designed to correlate with the curricular guidelines of the ACM/IEEE Computer Science Curriculum 2008, *Data Structures Using Java* introduces students to the more advanced concepts of writing programs but is still accessible to non-computer science majors. Believing that learning how to design and write programs requires hands-on application of concepts, the author includes labs throughout the text for students to immediately apply and test the newly learned material. The accessible writing style and hands-on approach of *Data Structures Using Java*, will provide your students with the skills necessary to design and use algorithms and data structures in their programming careers in an uncluttered environment, and efficient manner. Key Features: -Content correlates to the learning objectives of the curricular guidelines of the 2008 ACM/IEEE Computer Science Curriculum. -Avoids much of the advanced theory to provide

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students with the practical skills required to write algorithms and create data structures, in a one-term CS2 course. -Ideal for students who want to enter the programming profession immediately -Includes lab exercises throughout for students to apply the newly learned concepts. Instructor Resources: -PowerPoint Lecture Outlines -Solutions to the chapter exercises -Test Bank -Source Code needed for the programming exercises.

This version of the book uses the latest Java technology, Java 2 Standard Edition Version 5.0 (J2SE V. 5.0), or otherwise known as "Version 5.0." This revolutionary book intertwines problem solving and software engineering with the study of traditional data structures topics. The book emphasizes the use of objects and object-oriented design. Early chapters provide background coverage of software engineering. Then, in the chapters on data structures, these principles are applied. The authors encourage use of a five-step process for the solution of case studies: problem specification, analysis, design, implementation, and testing. As is done in industry, these steps are sometimes performed in an iterative fashion rather than in strict sequence. The Java Application Programming Interface (API) is used throughout the text. Wherever possible, the specification and interface for a data structure follow the Java Collections Framework. Emphasizes the use of objects and object-oriented design Provides a

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primer on the Java language and offers background coverage of software engineering Encourages an iterative five-step process for the solution of case studies: problem specification, analysis, design, implementation, and testing The Java Application Programming Interface (API) is used throughout Once again, the Litvins bring you a textbook that expertly covers the subject, is fun to read, and works for students with different learning styles. In one volume, this edition covers both introductory Java/OOP A-level material and AB-level topics (data structures and algorithms). The book follows Java 5.0 and incorporates many other changes, big and small, to reflect the current priorities of the AP CS program. This edition offers an early focus on object-oriented programming and design and an expanded discussion of the Java collections framework. What has not changed is the authors' respect for students, clear explanation of concepts, common sense about practical software development issues, and realistic and fun case studies and labs. By choosing this book, you have joined the many thousands of students who have mastered computer science fundamentals and received high grades on AP CS exams using the Litvins' C++ and Java books. - Back cover.

This is a complete introduction to the critical topic of data structures, written from the object-oriented perspective most students and practitioners are adopting. The book

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introduces data structures using C++, a language whose classes and object-oriented constructs are specifically designed to efficiently implement data structures. The opening chapters introduce the ideas behind object-oriented programming and C++; once these ideas are explained, the book introduces data structures and algorithms from an O-O point of view. All standard data structures are described, including stacks, queues, sets, linked lists, trees and graphs. Searching and sorting algorithms are also studied. This book is for students and others working with data structures, especially object-oriented developers interested in ways data structures can enhance their effectiveness.

This first edition book integrates data structures, library design, and software principles into one package. The authors begin with simple software engineering concepts, and repeatedly use them to develop applications throughout the text. The topics covered include fundamental design concepts and principles; object oriented analysis and design; and design for reuse. For computer programmers.

Includes bibliographical references and index.

This is the first text designed for an elementary data structures course to incorporate the important concepts of object-oriented programming. Specifically, the text uses objects in the definition, design and implementation of abstract data types.

For a freshman/sophomore-level course in Data Structures in Computer Science. This text teaches the use of direct source code implementations and the use of the Java libraries; it helps students prepare for later

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work on larger Java software solutions by adhering to software engineering principles and techniques such as the UML and the Java Collections Framework (JCF). Using the spiral approach to cover such topics as linked structures, recursion, and algorithm analysis, this text also provides revealing illustrations, summaries, review questions, and specialized reference sections.

The design and analysis of efficient data structures has long been recognized as a key component of the Computer Science curriculum. Goodrich, Tomassia and Goldwasser's approach to this classic topic is based on the object-oriented paradigm as the framework of choice for the design of data structures. For each ADT presented in the text, the authors provide an associated Java interface. Concrete data structures realizing the ADTs are provided as Java classes implementing the interfaces. The Java code implementing fundamental data structures in this book is organized in a single Java package, `net.datastructures`. This package forms a coherent library of data structures and algorithms in Java specifically designed for educational purposes in a way that is complimentary with the Java Collections Framework.

Data Structures and Other Objects Using C++ takes a gentle approach to the data structures course in C++. Providing an early, self-contained review of object-oriented programming and C++, this text gives students a firm grasp of key concepts and allows those experienced in another language to adjust easily. Flexible by design, professors have the option of emphasizing object-oriented programming, covering

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recursion and sorting early, or accelerating the pace of the course. Finally, a solid foundation in building and using abstract data types is also provided, along with an assortment of advanced topics such as B-trees for project building and graphs.

This book employs an object-oriented approach to teaching data structures using Java. Many worked examples and approximately 300 additional examples make this book easily accessible to the reader. Most of the concepts in the book are illustrated by several examples, allowing readers to visualize the processes being taught. Introduces abstract concepts, shows how those concepts are useful in problem solving, and then shows the abstractions can be made concrete by using a programming language. Equal emphasis is placed on both the abstract and the concrete versions of a concept, so that the reader learns about the concept itself, its implementation, and its application. For anyone with an interest in learning more about data structures.

Object-oriented database management systems (OODBMS) are used to implement and maintain large object databases on persistent storage. Regardless whether the underlying database model follows the object-oriented, the relational or the object-relational paradigm, a key feature of any DBMS product is content based access to data sets. On the one hand this feature provides user-friendly query interfaces based on predicates to describe the desired data. On the other hand it poses challenging questions regarding DBMS design and implementation as well as the application development process on top of the DBMS. The reason for the latter is that the actual query performance depends on a technically meaningful use of access support mechanisms. In particular, if chosen and applied properly, such a mechanism speeds up the execution of predicate based queries. In the

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object-oriented world, such queries may involve arbitrarily complex terms referring to inheritance hierarchies and aggregation paths. These features are attractive at the application level, however, they increase the complexity of appropriate access support mechanisms which are known to be technically non-trivial in the relational world.

Takes a gentle approach to learning data structures using the Java programming language. Providing an early, self-contained review of object-oriented programming and Java, this text gives readers a firm grasp of key concepts and allows those experienced in another language to adjust easily. It has a solid foundation in building and using abstract data types, along with an assortment of advanced topics such as B-trees for project building and graph. It incorporates Java 5.0 including the use of scanner class and generic data types (generics). MARKET: This book is if for anyone interested in learning how to write effective data structures using the Java language.

Data Structures and Object-Oriented Programming with C++ has been specifically designed and written to meet the requirements of the engineering students. This is a core subject in the curriculum of all Computer Science programs. The aim of this book is to help the students develop programming and analytical skills simultaneously such that they are able to design programs with maximum efficiency. C language has been used in the book to permit the execution of basic data structures in a variety of ways. This book also provides an in-depth coverage of object-oriented concepts, such as encapsulation, abstraction, inheritance, polymorphism, message passing and dynamic binding, templates, exception handling, streams and standard template library (STL) in C++.

"It is a practical book with emphasis on real problems the programmers encounter daily." --Dr. Tim H. Lin, California

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State Polytechnic University, Pomona "My overall impressions of this book are excellent. This book emphasizes the three areas I want: advanced C++, data structures and the STL and is much stronger in these areas than other competing books." --Al Verbanec, Pennsylvania State University Think, Then Code When it comes to writing code, preparation is crucial to success. Before you can begin writing successful code, you need to first work through your options and analyze the expected performance of your design. That's why Elliot Koffman and Paul Wolfgang's Objects, Abstraction, Data Structures, and Design: Using C++ encourages you to Think, Then Code, to help you make good decisions in those critical first steps in the software design process. The text helps you thoroughly understand basic data structures and algorithms, as well as essential design skills and principles. Approximately 20 case studies show you how to apply those skills and principles to real-world problems. Along the way, you'll gain an understanding of why different data structures are needed, the applications they are suited for, and the advantages and disadvantages of their possible implementations. Key Features * Object-oriented approach. * Data structures are presented in the context of software design principles. * 20 case studies reinforce good programming practice. * Problem-solving methodology used throughout... "Think, then code!" * Emphasis on the C++ Standard Library. * Effective pedagogy.

Object-Oriented Data Structures Using Java, Fourth Edition presents traditional data structures and object-oriented topics with an emphasis on problem-solving, theory, and software engineering principles.

Guide to the object-oriented programming language

This textbook provides an in depth course on data structures in the context of object oriented development.

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Its main themes are abstraction, implementation, encapsulation, and measurement: that is, that the software process begins with abstraction of data types, which then lead to alternate representations and encapsulation, and finally to resource measurement. A clear object oriented approach, making use of Booch components, will provide readers with a useful library of data structure components and experience in software reuse. Students using this book are expected to have a reasonable understanding of the basic logical structures such as stacks and queues. Throughout, Ada 95 is used and the author takes full advantage of Ada's encapsulation features and the ability to present specifications without implementational details. Ada code is supported by two suites available over the World Wide Web.

An updated, innovative approach to data structures and algorithms Written by an author team of experts in their fields, this authoritative guide demystifies even the most difficult mathematical concepts so that you can gain a clear understanding of data structures and algorithms in C++. The unparalleled author team incorporates the object-oriented design paradigm using C++ as the implementation language, while also providing intuition and analysis of fundamental algorithms. Offers a unique multimedia format for learning the fundamentals of data structures and algorithms Allows you to visualize key analytic concepts, learn about the most recent insights in the field, and do data structure design Provides clear approaches for developing programs Features a clear, easy-to-understand writing style that breaks down even

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the most difficult mathematical concepts Building on the success of the first edition, this new version offers you an innovative approach to fundamental data structures and algorithms.

This book offers a thorough introduction to the concepts and practices of object-oriented programming in Java. It also introduces the most common data structures and related algorithms and their implementations in the Java collections framework. Chapters 1-14 follow the syllabus of the AP Computer Science in Java course. They will prepare you well for the AP CS exam. Chapters 15-18 on file input and output, graphics, graphical user interfaces, and events handling in Java will give you a better sense of real-world Java programming; this material also makes case studies, labs, and exercises more fun. Chapters 19-26 deal with more advanced data structures and algorithms. Chapter 27, Design Patterns, introduces more intricate aspects of object-oriented design and serves as an introduction to design patterns. The last chapter, Computing in Context, discusses creative, responsible, and ethical computer use.

This compact and comprehensive book provides an introduction to data structures from an object-oriented perspective using the powerful language C++ as the programming vehicle. It is designed as an ideal text for the students before they start designing algorithms in C++. The book begins with an overview of C++, then it goes on to analyze the basic concepts of data structures, and finally focusses the reader's attention on abstract data structures. In so doing, the text uses simple examples to explain the meaning of each data type.

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Throughout, an attempt has been made to enable students to progress gradually from simple object-oriented abstract data structures to more advanced data structures. A large number of worked examples and the end-of-chapter exercises help the students reinforce the knowledge gained. Intended as a one-semester course for undergraduate students in computer science and for those who offer this course in engineering and management, the book should also prove highly useful to those IT professionals who have a keen interest in the subject.

Data Structures and Algorithms in Java, Second Edition is designed to be easy to read and understand although the topic itself can be quite complicated. Algorithms are the procedures that software programs use to manipulate data structures. Besides clear and simple example programs, the author includes a workshop as a small demonstration program executable on a web browser. The programs demonstrate in graphical form what data structures look like and how they operate. In the second edition, the program is rewritten to improve operation and clarify the algorithms, the example programs are revised to work with the latest version of the Java JDK, and questions and exercises will be added at the end of each chapter making the book more useful to readers.

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Data Structures & Theory of Computation

Continuing the success of the popular second edition, the updated and revised Object-Oriented Data Structures Using Java, Third Edition is sure to be an essential

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resource for students learning data structures using the Java programming language. It presents traditional data structures and object-oriented topics with an emphasis on problem-solving, theory, and software engineering principles. Beginning early and continuing throughout the text, the authors introduce and expand upon the use of many Java features including packages, interfaces, abstract classes, inheritance, and exceptions. Numerous case studies provide readers with real-world examples and demonstrate possible solutions to interesting problems. The authors' lucid writing style guides readers through the rigor of standard data structures and presents essential concepts from logical, applications, and implementation levels. Key concepts throughout the Third Edition have been clarified to increase student comprehension and retention, and end-of-chapter exercises have been updated and modified. New and Key Features to the Third Edition: -Includes the use of generics throughout the text, providing the dual benefits of allowing for a type safe use of data structures plus exposing students to modern approaches. -This text is among the first data structures textbooks to address the topic of concurrency and synchronization, which are growing in the importance as computer systems move to using more cores and threads to obtain additional performance with each new generation. Concurrency and synchronization are introduced in the new Section 5.7, where it begins with the basics of Java threads. -Provides numerous case studies and examples of the problem solving process. Each case study includes problem description, an analysis of the problem input

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and required output, and a discussion of the appropriate data structures to use. -Expanded chapter exercises allow you as the instructor to reinforce topics for your students using both theoretical and practical questions.

-Chapters conclude with a chapter summary that highlights the most important topics of the chapter and ties together related topics. Instructor Resources:

-Answers to the exercises in the text -Glossary of terms

-PowerPoint Lecture Outlines -Test bank

Where will you be ten years from now? How will a course in data structures help you? Perhaps you will be a software engineer writing large software in specialized areas such as computer graphics. The authors of such programs, today and in the future, require a ready knowledge of proven methods for representing data. For example, the graphics program that generated the cover of this book uses a collection of three-dimensional objects--and a programmer must use the knowledge of data structures to make decisions on how to represent such collections. As a programmer, you must also possess an unshakable understanding of fundamental programming techniques and algorithms to manipulate the data structures. The graphics program is again a good example, using recursion to generate beautiful fractal patterns, and using efficient sorting algorithms in the process of removing hidden objects. With many accessible examples, this book provides the knowledge of data representations and algorithms in a way that will be immediately useful to you with C++. This book also focuses on foundational material that will continue to be useful to you over the next ten years and beyond. Data

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Structures and Other Objects Using C++ provides: a balanced approach to data structures and object-oriented programming early, self-contained coverage of key C++ and object-oriented programming topics a solid foundation in specifying, designing, implementing, and using simple container classes, lists, stacks, queues, trees, and more accessible coverage of fundamental topics such as container classes, pointers and linked lists, time analysis, testing, recursion, searching and sorting extensive appendices that will make this book a valuable resource for years to come

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Object-Oriented Data Structures Using Java Jones & Bartlett Publishers

This book provides a broad coverage of fundamental and advanced concepts of data structures and algorithms.

The material presented includes a treatment of elementary data structures such as arrays, lists, stacks, and trees, as well as newer structures that have emerged to support the processing of multidimensional or spatial data files. These newer structures and algorithms have received increasing attention in recent years in conjunction with the rapid growth in computer-aided design, computer graphics, and related fields in which multidimensional data structures are of great interest. Our main objective is to mesh the underlying concepts with application examples that are of practical use and are timely in their implementations. To this end, we have used mainly the Abstract Data Structure (or Abstract Data Type (ADT)) approach to define structures for data and operations. Object-oriented programming

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(OOP) methodologies are employed to implement these ADT concepts. In OOP, data and operations for an ADT are combined into a single entity (object). ADTs are used to specify the objects-arrays, stacks, queues, trees, and graphs. OOP allows the programmer to more closely mimic the real-world applications. This OOP is more structured and modular than previous attempts. OOP has become de facto state-of-the-art in the 1990s.

Data Structures in Java is a continuation of Nell Dale's best-selling Introduction to Java and Software Design text. Data Structures is designed for students who have already taken one semester of computer science and are able to take a problem of medium complexity, write an algorithm to solve the problem, code the algorithm in a programming language, and demonstrate the correctness of their solution. The focus is on teaching computer science principles with chapter concepts being reinforced by case studies. The object-oriented concepts of encapsulation, inheritance, and polymorphism are covered, while the book remains centered on abstract data types.

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