

Data Abstraction And Problem Solving With C Walls And

This book constitutes the refereed proceedings of the 14th IFIP WG 9.4 International Conference on Social Implications of Computers in Developing Countries, ICT4D 2017, held in Yogyakarta, Indonesia, in May 2017. The 60 revised full papers and 8 short papers presented together with 3 keynotes were carefully reviewed and selected from 118 submissions. The papers are organized in the following topical

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sections: large scale and complex information systems for development; women empowerment and gender justice; social mechanisms of ICT-enabled development; the data revolution and sustainable development goals; critical perspectives on ICT and open innovation for development; the contribution of practice theories to ICT for development; agile development; indigenous local community grounded ICT developments; global sourcing and development; sustainability in ICT4D; and information systems development and implementation in Southeast

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Asia. Also included are a graduate student track, current issues and notes. The chapter 'An Analysis of Accountability Concepts for Open Development' is open access under a CC BY 4.0 license via link.springer.com.

"Focusing on data abstraction and data structures, the second edition of this very successful book continues to emphasize the needs of both the instructor and the student. The book illustrates the role of classes and abstract data types (ADTs) in the problem-solving process as the foundation for an object-oriented approach. Throughout the next,

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the distinction between specification and implementation is continually stressed. The text covers major applications of ADTs, such as searching a flight map and performing an event-driven simulation. It also offers early, extensive coverage of recursion and uses this technique in many examples and exercises. Overall, the lucid writing style, widespread use of examples, and flexible coverage of material have helped make this a leading book in the field."

--Book Jacket.

A hands-on, problem-based introduction to building algorithms and data structures to

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solve problems with a computer.

Algorithmic Thinking will teach you how to solve challenging programming problems and design your own algorithms.

Daniel Zingaro, a master teacher, draws his examples from world-class programming competitions like USACO and IOI. You'll learn how to classify problems, choose data structures, and identify appropriate algorithms. You'll also learn how your choice of data structure, whether a hash table, heap, or tree, can affect runtime and speed up your algorithms; and how to adopt powerful strategies like

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recursion, dynamic programming, and binary search to solve challenging problems. Line-by-line breakdowns of the code will teach you how to use algorithms and data structures like:

- The breadth-first search algorithm to find the optimal way to play a board game or find the best way to translate a book
- Dijkstra's algorithm to determine how many mice can exit a maze or the number of fastest routes between two locations
- The union-find data structure to answer questions about connections in a social network or determine who are friends or enemies
- The heap data

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structure to determine the amount of money given away in a promotion • The hash-table data structure to determine whether snowflakes are unique or identify compound words in a dictionary NOTE: Each problem in this book is available on a programming-judge website. You'll find the site's URL and problem ID in the description. What's better than a free correctness check?

This book constitutes the refereed proceedings of the 6th International Conference on Advances in Visual Informatics, IVIC 2019, held in Bangi, Malaysia, in November 2019.

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The 65 papers presented were carefully reviewed and selected from 130 submissions. The papers are organized into the following topics: Visualization and Digital Innovation for Society 5.0; Engineering and Digital Innovation for Society 5.0; Cyber Security and Digital Innovation for Society 5.0; and Social Informatics and Application for Society 5.0.

Animated Problem Solving
An Introduction to Program
Design Using Video Game
Development

14th IFIP WG 9.4 International
Conference on Social
Implications of Computers in

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Walls And

Developing Countries, ICT4D
2017, Yogyakarta, Indonesia,
May 22-24, 2017, Proceedings
Data Abstraction and Problem
Solving with Java, Walls and
Mirrors, Updated Edition
(International Edition)

Data Abstraction & Problem
Solving with C++
Walls and Mirrors

A presentation of the central and basic
concepts, techniques, and tools of
computer science, with the emphasis
on presenting a problem-solving
approach and on providing a survey of
all of the most important topics
covered in degree programmes.
Scheme is used throughout as the
programming language and the author
stresses a functional programming

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approach to create simple functions so as to obtain the desired programming goal. Such simple functions are easily tested individually, which greatly helps in producing programs that work correctly first time. Throughout, the author aids to writing programs, and makes liberal use of boxes with "Mistakes to Avoid." Programming examples include: * abstracting a problem; * creating pseudo code as an intermediate solution; * top-down and bottom-up design; * building procedural and data abstractions; * writing programs in modules which are easily testable. Numerous exercises help readers test their understanding of the material and develop ideas in greater depth, making this an ideal first course for all students coming to computer science for the first time. The design and analysis of efficient

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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

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Collections Framework.

Showing off scheme - Functions -
Expressions - Defining your own
procedures - Words and sentences -
True and false - Variables - Higher-
order functions - Lambda - Introduction
to recursion - The leap of faith - How
recursion works - Common patterns in
recursive procedures - Advanced
recursion - Example : the functions
program - Files - Vectors - Example : a
spreadsheet program - Implementing
the spreadsheet program - What's
next?

Data Structures and Problem Solving
Using C++ provides a practical
introduction to data structures and
algorithms from the viewpoint of
abstract thinking and problem solving,
as well as the use of C++. It is a
complete revision of Weiss' successful
CS2 book Algorithms, Data Structures,

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and Problem Solving with C++. The most unique aspect of this text is the clear separation of the interface and implementation. C++ allows the programmer to write the interface and implementation separately, to place them in separate files and compile separately, and to hide the implementation details. This book goes a step further: the interface and implementation are discussed in separate parts of the book. Part I (Objects and C++), Part II (Algorithms and Building Blocks), and Part III (Applications) lay the groundwork by discussing basic concepts and tools and providing some practical examples, but implementation of data structures is not shown until Part IV (Implementations). This separation of interface and implementation promotes abstract thinking. Class

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interfaces are written and used before the implementation is known, forcing the reader to think about the functionality and potential efficiency of the various data structures (e.g., hash tables are written well before the hash table is implemented). Throughout the book, Weiss has included the latest features of the C++ programming language, including a more prevalent use of the Standard Template Library (STL).

Data Abstraction and Problem Solving
with C++

An Introduction to Programming and
Computing

Data Abstraction & Problem Solving
With Java

A Problem-Based Introduction

Data Structures and Problem Solving
Using Java

Learning PHP 7

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Advanced Algorithms and Data Structures introduces a collection of algorithms for complex programming challenges in data analysis, machine learning, and graph computing. Summary As a software engineer, you'll encounter countless programming challenges that initially seem confusing, difficult, or even impossible. Don't despair! Many of these "new" problems already have well-established

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solutions. Advanced Algorithms and Data Structures teaches you powerful approaches to a wide range of tricky coding challenges that you can adapt and apply to your own applications. Providing a balanced blend of classic, advanced, and new algorithms, this practical guide upgrades your programming toolbox with new perspectives and hands-on techniques. Purchase of the print book includes a free eBook in PDF, Kindle,

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and ePub formats from Manning Publications. About the technology Can you improve the speed and efficiency of your applications without investing in new hardware? Well, yes, you can: Innovations in algorithms and data structures have led to huge advances in application performance. Pick up this book to discover a collection of advanced algorithms that will make you a more effective developer. About the book Advanced

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Algorithms and Data Structures introduces a collection of algorithms for complex programming challenges in data analysis, machine learning, and graph computing. You'll discover cutting-edge approaches to a variety of tricky scenarios. You'll even learn to design your own data structures for projects that require a custom solution. What's inside

Build on basic data structures you already know Profile your

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algorithms to speed up
application Store and
query strings
efficiently Distribute
clustering algorithms
with MapReduce Solve
logistics problems using
graphs and optimization
algorithms About the
reader For intermediate
programmers. About the
author Marcello La Rocca
is a research scientist
and a full-stack
engineer. His focus is
on optimization
algorithms, genetic
algorithms, machine
learning, and quantum

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computing. Table of
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data structures PART 1
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randomization to balance
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Bloom filters: Reducing
the memory for tracking
content 5 Disjoint sets:
Sub-linear time
processing 6 Trie, radix
trie: Efficient string
search 7 Use case: LRU
cache PART 2
MULTIDEMENSIONAL QUERIES

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planarity: Drawing
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Gradient descent:

Optimization problems
(not just) on graphs 17

Simulated annealing:

Optimization beyond
local minima 18

Genetic
algorithms: Biologically
inspired, fast-
converging optimization

Using the latest

features of Java 5, this
unique object-oriented
presentation introduces

readers to data

structures via thirty,

manageable chapters. KEY

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Features TOPICS:

Introduces each ADT in its own chapter, including examples or applications. Provides a variety of exercises and projects, plus additional self-assessment questions throughout. the text Includes generic data types as well as enumerations, for-each loops, the interface Iterable, the class Scanner, assert statements, and autoboxing and unboxing. Identifies important

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Java code as a Listing. Provides NNotes and Pprogramming Ttips in each chapter. For programmers and software engineers interested in learning more about data structures and abstractions. Praise for the first edition: "The well-written, comprehensive book...[is] aiming to become a de facto reference for the language and its features and capabilities. The pace is appropriate for

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beginners; programming concepts are introduced progressively through a range of examples and then used as tools for building applications in various domains, including sophisticated data structures and algorithms...Highly recommended. Students of all levels, faculty, and professionals/practitioners. -D. Papamichail, University of Miami in CHOICE Magazine Mark Lewis' Introduction to the Art of Programming Using Scala was the

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first textbook to use Scala for introductory CS courses. Fully revised and expanded, the new edition of this popular text has been divided into two books. Object-Orientation, Abstraction, and Data Structures Using Scala, Second Edition is intended to be used as a textbook for a second or third semester course in Computer Science. The Scala programming language provides powerful constructs for expressing both object

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orientation and abstraction. This book provides students with these tools of object orientation to help them structure solutions to larger, more complex problems, and to expand on their knowledge of abstraction so that they can make their code more powerful and flexible. The book also illustrates key concepts through the creation of data structures, showing how data structures can be written, and the strengths and weaknesses

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of each one. Libraries that provide the functionality needed to do real programming are also explored in the text, including GUIs, multithreading, and networking. The book is filled with end-of-chapter projects and exercises, and the authors have also posted a number of different supplements on the book website. Video lectures for each chapter in the book are also available on YouTube. The videos show construction of

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code from the ground up and this type of "live coding" is invaluable for learning to program, as it allows students into the mind of a more experienced programmer, where they can see the thought processes associated with the development of the code. About the Authors Mark Lewis is an Associate Professor at Trinity University. He teaches a number of different courses, spanning from first semester introductory courses to

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advanced seminars. His research interests included simulations and modeling, programming languages, and numerical modeling of rings around planets with nearby moons. Lisa Lacher is an Assistant Professor at the University of Houston, Clear Lake with over 25 years of professional software development experience. She teaches a number of different courses spanning from first semester introductory courses to graduate

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level courses. Her research interests include Computer Science Education, Agile Software Development, Human Computer Interaction and Usability Engineering, as well as Measurement and Empirical Software Engineering.

The Second Edition of Data Abstraction and Problem Solving with Java: Walls and Mirrors presents fundamental problem-solving and object-oriented programming skills by

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focusing on data abstraction (the walls) and recursion (the mirrors). It is fully revised to use the latest version of the Java programming language (Java 5.0). Java 5.0 is particularly well suited for presenting object-oriented programming, and helps enhance this edition's increased focus on object-oriented programming and data abstraction. Clear, accessible writing is complemented by a

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Walls And

pedagogically rich
presentation throughout
this textbook.

Data Abstraction and
Problem Solving with
Java: Walls and Mirrors
Data Abstraction and
Problem Solving with
Java

Theory and Practice
Data Structures and
Problem Solving Using
C++

Data Structures and
Other Objects Using Java
Introduction to
Computing and Algorithms
Designed for a second course in
computer science, this textbook

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introduces the data abstraction technique for building walls between a program and its data structures, and presents various abstract data types and their implementations as C++ classes. The author evaluates the advantages and disadvantages of array-based and pointer-based data structures, and explains the concepts behind recursion, inheritance, polymorphism, algorithm efficiency, and balanced search trees.

Annotation : 2004 Book News, Inc., Portland, OR (booknews.com).

Rev. ed. of: Data abstraction and problem solving with Java /

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Frank M. Carrano, Janet J.
Prichard. 2007.

Data Structures and Problem Solving Using Java, Second Edition provides a practical introduction to data structures and algorithms from the viewpoint of abstract thinking and problem solving, as well as the use of Java. This text has a clear separation of the interface and implementation to promote abstract thinking. Java allows the programmer to write the interface and implementation separately, to place them in separate files and compile separately, and to hide the implementation details. This book goes a step further: the

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interface and implementation are discussed in separate parts of the book. Part I (Tour of Java), Part II (Algorithms and Building Blocks), and Part III (Applications) lay the groundwork by discussing basic concepts and tools and providing some practical examples, but implementation of data structures is not shown until Part IV (Implementations). Class interfaces are written and used before the implementation is known, forcing the reader to think about the functionality and potential efficiency of the various data structures (e.g., hash tables are written well before the hash table is

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implemented). *NEW! Complete chapter covering Design Patterns (Chapter 5). *NE Data Structures and Other Objects Using Java is a gradual, "just-in-time" introduction to Data Structures for a CS2 course. Each chapter provides a review of the key aspects of object-oriented programming and a syntax review, giving students the foundation for understanding significant programming concepts. With this framework they are able to accomplish writing functional data structures by using a five-step method for working with data types; understanding the data type abstractly, writing a

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specification, using the data type, designing and implementing the data type, and analyzing the implementation. Students learn to think analytically about the efficiency and efficacy of design while gaining exposure to useful Java classes libraries.

International Edition
Problem Solving with
Algorithms and Data Structures
Using Python
Data Abstraction and Structures
Using C++
Objects, Abstraction, Data
Structures and Design
Understanding and Improving
Learning in Undergraduate
Science and Engineering

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Learn the art of PHP programming through this example-rich book filled to the brim with tutorials every PHP developer needs to know About This Book Set up the PHP environment and get started with web programming Leverage the potential of PHP for server-side programming, memory management, and object-oriented programming (OOP) This book is packed with real-life examples to help you implement the concepts as you learn Who This Book Is For If you are a web developer or programmer who wants to create real-life web applications using PHP 7, or a beginner who wants to get started with PHP 7 programming, this book is for you. Prior knowledge of PHP, PHP 7, or

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programming is not mandatory.

What You Will Learn Set up a server on your machine with PHP Use PHP syntax with the built-in server to create apps Apply the OOP paradigm to PHP to write richer code Use MySQL to manage data in your web applications Create a web application from scratch using MVC Add tests to your web application and write testable code Use an existing PHP framework to build and manage your applications Build REST APIs for your PHP applications Test the behavior of web applications with Behat In Detail PHP is a great language for building web applications. It is essentially a server-side scripting language that is also used for general purpose

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programming. PHP 7 is the latest version with a host of new features, and it provides major backwards-compatibility breaks. This book begins with the fundamentals of PHP programming by covering the basic concepts such as variables, functions, class, and objects. You will set up PHP server on your machine and learn to read and write procedural PHP code. After getting an understanding of OOP as a paradigm, you will execute MySQL queries on your database. Moving on, you will find out how to use MVC to create applications from scratch and add tests. Then, you will build REST APIs and perform behavioral tests on your applications. By the end of the book, you will have the

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skills required to read and write files, debug, test, and work with MySQL.

Style and approach This book begins with the basics that all PHP developers use every day and then dives deep into detailed concepts and tricks to help you speed through development. You will be able to learn the concepts by performing practical tasks and implementing them in your daily activities, all at your own pace.

This classic, best selling data structures text provides you with a firm foundation in data abstraction that emphasizes the distinction between specifications and implementation as the basis for an object-oriented approach. Software engineering principles and concepts

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as well as UML diagrams are used to enhance your understanding. The National Science Foundation funded a synthesis study on the status, contributions, and future direction of discipline-based education research (DBER) in physics, biological sciences, geosciences, and chemistry. DBER combines knowledge of teaching and learning with deep knowledge of discipline-specific science content. It describes the discipline-specific difficulties learners face and the specialized intellectual and instructional resources that can facilitate student understanding. Discipline-Based Education Research is based on a 30-month study built on two workshops held in

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2008 to explore evidence on promising practices in undergraduate science, technology, engineering, and mathematics (STEM) education. This book asks questions that are essential to advancing DBER and broadening its impact on undergraduate science teaching and learning. The book provides empirical research on undergraduate teaching and learning in the sciences, explores the extent to which this research currently influences undergraduate instruction, and identifies the intellectual and material resources required to further develop DBER. Discipline-Based Education Research provides guidance for future DBER research. In addition,

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the findings and recommendations of this report may invite, if not assist, post-secondary institutions to increase interest and research activity in DBER and improve its quality and usefulness across all natural science disciplines, as well as guide instruction and assessment across natural science courses to improve student learning. The book brings greater focus to issues of student attrition in the natural sciences that are related to the quality of instruction. Discipline-Based Education Research will be of interest to educators, policy makers, researchers, scholars, decision makers in universities, government agencies, curriculum developers, research sponsors, and education

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advocacy groups.

A completely revised edition, offering new design recipes for interactive programs and support for images as plain values, testing, event-driven programming, and even distributed programming. This introduction to programming places computer science at the core of a liberal arts education. Unlike other introductory books, it focuses on the program design process, presenting program design guidelines that show the reader how to analyze a problem statement, how to formulate concise goals, how to make up examples, how to develop an outline of the solution, how to finish the program, and how to test it. Because learning to design programs is about the

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study of principles and the acquisition of transferable skills, the text does not use an off-the-shelf industrial language but presents a tailor-made teaching language. For the same reason, it offers DrRacket, a programming environment for novices that supports playful, feedback-oriented learning. The environment grows with readers as they master the material in the book until it supports a full-fledged language for the whole spectrum of programming tasks. This second edition has been completely revised. While the book continues to teach a systematic approach to program design, the second edition introduces different design recipes for interactive programs with

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graphical interfaces and batch programs. It also enriches its design recipes for functions with numerous new hints. Finally, the teaching languages and their IDE now come with support for images as plain values, testing, event-driven programming, and even distributed programming.

Introducing Computer Science
Discipline-Based Education
Research

Supporting Task for Problem
Solving Activities

6th International Visual Informatics
Conference, IVIC 2019, Bangi,
Malaysia, November 19–21, 2019,
Proceedings

Data Abstraction & Problem Solving
with Java[electronic Resource]

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How to Design Programs, second edition

Whether you are a student or a working professional, you can benefit from being better at solving the complex problems that come up in your life. Strategic Thinking in Complex Problem Solving provides a general framework and the necessary tools to help you do so.

Based on his groundbreaking course at Rice University, engineer and former strategy consultant Arnaud Chevallier provides practical ways to develop problem solving skills, such as investigating complex questions with issue maps, using logic to promote

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creativity, leveraging analogical thinking to approach unfamiliar problems, and managing diverse groups to foster innovation. This book breaks down the resolution process into four steps: 1) frame the problem (identifying what needs to be done), 2) diagnose it (identifying why there is a problem, or why it hasn't been solved yet), 3) identify and select potential solutions (identifying how to solve the problem), and 4) implement and monitor the solution (resolving the problem, the 'do'). For each of these four steps - the what, why, how, and do -

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this book explains techniques that promotes success and demonstrates how to apply them on a case study and in additional examples. The featured case study guides you through the resolution process, illustrates how these concepts apply, and creates a concrete image to facilitate recollection. Strategic Thinking in Complex Problem Solving is a tool kit that integrates knowledge based on both theoretical and empirical evidence from many disciplines, and explains it in accessible terms. As the book guides you through the various stages of solving

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complex problems, it also provides useful templates so that you can easily apply these approaches to your own personal projects. With this book, you don't just learn about problem solving, but how to actually do it.

The Third Edition of Data Abstraction and Problem Solving with Java: Walls and Mirrors employs the analogies of Walls (data abstraction) and Mirrors (recursion) to teach Java programming design solutions, in a way that beginning students find accessible. The book has a student-friendly pedagogical approach that carefully accounts for the strengths

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and weaknesses of the Java language. With this book, students will gain a solid foundation in data abstraction, object-oriented programming, and other problem-solving techniques. Using C++, this book presents introductory programming material. Only the features of C++ that are appropriate to introductory concepts are introduced. Object-oriented concepts are presented. Abstraction is stressed throughout the book and pointers are presented in a gradual and gentle fashion for easier learning. THIS TEXTBOOK is about computer science. It is also about Python. However, there

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is much more. The study of algorithms and data structures is central to understanding what computer science is all about. Learning computer science is not unlike learning any other type of difficult subject matter. The only way to be successful is through deliberate and incremental exposure to the fundamental ideas. A beginning computer scientist needs practice so that there is a thorough understanding before continuing on to the more complex parts of the curriculum. In addition, a beginner needs to be given the opportunity to be successful and gain

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confidence. This textbook is designed to serve as a text for a first course on data structures and algorithms, typically taught as the second course in the computer science curriculum. Even though the second course is considered more advanced than the first course, this book assumes you are beginners at this level. You may still be struggling with some of the basic ideas and skills from a first computer science course and yet be ready to further explore the discipline and continue to practice problem solving. We cover abstract data types and data structures, writing

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algorithms, and solving problems. We look at a number of data structures and solve classic problems that arise. The tools and techniques that you learn here will be applied over and over as you continue your study of computer science.

Data Abstraction & Problem Solving with C++:

International Edition

Data Abstraction

Algorithmic Thinking

Strategic Thinking in

Complex Problem Solving

Use Case Driven Object

Modeling with UML Theory and Practice

Abstraction in Artificial Intelligence and Complex

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And Problem Solving With C
Walls And
Systems

"It is a practical book with emphasis on real problems the programmers encounter daily."

--Dr.Tim H. Lin, California 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

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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-

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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.*

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This textbook is about systematic problem solving and systematic reasoning using type-driven design. There are two problem solving techniques that are emphasized throughout the book: divide and conquer and iterative refinement. Divide and conquer is the process by which a large problem is broken into two or more smaller problems that are easier to solve and then the solutions for the smaller pieces are combined to create an answer to the problem. Iterative refinement is the process by which a solution to a problem is gradually made better—like the drafts of an

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essay. Mastering these techniques are essential to becoming a good problem solver and programmer. The book is divided in five parts. Part I focuses on the basics. It starts with how to write expressions and subsequently leads to decision making and functions as the basis for problem solving. Part II then introduces compound data of finite size, while Part III covers compound data of arbitrary size like e.g. lists, intervals, natural numbers, and binary trees. It also introduces structural recursion, a powerful data-processing strategy that uses

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divide and conquer to process data whose size is not fixed. Next, Part IV delves into abstraction and shows how to eliminate repetitions in solutions to problems. It also introduces generic programming which is abstraction over the type of data processed. This leads to the realization that functions are data and, perhaps more surprising, that data are functions, which in turn naturally leads to object-oriented programming. Part V introduces distributed programming, i.e., using multiple computers to solve a

problem. This book promises that by the end of it readers will have designed and implemented a multiplayer video game that they can play with their friends over the internet. To achieve this, however, there is a lot about problem solving and programming that must be learned first. The game is developed using iterative refinement. The reader learns step-by-step about programming and how to apply new knowledge to develop increasingly better versions of the video game. This way, readers practice modern trends

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that are likely to be common throughout a professional career and beyond.

Data Structures: Abstraction and Design Using Java, 3rd Edition, combines a strong emphasis on problem solving and software design with the study of data structures. The authors discuss applications of each data structure to motivate its study. After providing the specification (interface) and the implementation (a Java class), case studies that use the data structure to solve a significant problem are introduced.

Data Abstraction and Problem Solving with C++ Walls and

Mirrors Addison Wesley

*Problem Solving, Abstraction,
and Design Using C++*

Information and

*Communication Technologies
for Development*

Data Structures and

Abstractions with Java

*Data Structures and Algorithms
in Java*

Simply Scheme

Using C++

Diagramming and process are important topics in today's software development world, as the UML diagramming language has come to be almost universally accepted. Yet process is necessary; by

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themselves, diagrams are of little use. Use Case Driven Object Modeling with UML - Theory and Practice combines the notation of UML with a lightweight but effective process - the ICONIX process - for designing and developing software systems. ICONIX has developed a growing following over the years. Sitting between the free-for-all of Extreme Programming and overly rigid processes such as RUP, ICONIX offers just enough structure to be successful.

Introduction to Computing and Algorithms prepares students for the world of computing by

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giving them a solid foundation in the study of computer science - algorithms. By taking an algorithm-based approach to the subject, this book helps readers grasp overall concepts rather than getting them bogged down with specific syntax details of a programming language that can become obsolete. Students work with algorithms from the start and apply these ideas to real problems that computers can help solve. The benefit of this approach is that students will understand the power of computers as problem-solving tools, learn to think like

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programmers, and gain an appreciation of the computer science discipline.

Abstraction is a fundamental mechanism underlying both human and artificial perception, representation of knowledge, reasoning and learning. This mechanism plays a crucial role in many disciplines, notably Computer Programming, Natural and Artificial Vision, Complex Systems, Artificial Intelligence and Machine Learning, Art, and Cognitive Sciences. This book first provides the reader with an overview of the notions of abstraction proposed in various

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disciplines by comparing both commonalities and differences. After discussing the characterizing properties of abstraction, a formal model, the KRA model, is presented to capture them. This model makes the notion of abstraction easily applicable by means of the introduction of a set of abstraction operators and abstraction patterns, reusable across different domains and applications. It is the impact of abstraction in Artificial Intelligence, Complex Systems and Machine Learning which creates the core of the book. A general framework, based on

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the KRA model, is presented, and its pragmatic power is illustrated with three case studies: Model-based diagnosis, Cartographic Generalization, and learning Hierarchical Hidden Markov Models.

The classic, best-selling Data Abstraction and Problem Solving with C++: Walls and Mirrors book provides a firm foundation in data abstraction that emphasizes the distinction between specifications and implementation as the basis for an object-oriented approach. This new edition offers the latest C++ features and an introduction to using

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Doxygen—a documentation generator for C++, enhanced coverage of Software

Engineering concepts and additional UML diagrams.

Frank's Making it Real blog <http://frank-m-carrano.com/blog/>

extends his textbooks and

lectures to a lively discussion

with instructors and students

about teaching and learning

computer science. Follow Frank

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Advances in Visual Informatics

Abstraction and Design Using

Java

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Exploring Computer Science
with Scheme

Data Structures

Walls & Mirrors

Object-Orientation, Abstraction,
and Data Structures Using
Scala

This work provides novice and professional programmers with a bridge from traditional programming methods to the object-oriented techniques available in C++. It clearly explains encapsulation and C++ classes, which are then used throughout to implement abstract data types such as lists, stacks, queues, trees and tables.

Inheritance, polymorphism, templates and operator overloading are explained both conceptually

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and through examples. The work offers early, extensive coverage of recursion and uses the technique through many examples and exercises. It sets out to provide a firm foundation in data abstraction, emphasizing the distinction between specification and implementation.

Data Structures and Algorithms
Using Python

Advanced Algorithms and Data
Structures

Data Abstraction & Problem Solving
with Java

Data Structures Using Java