Boost Library Documentation

C++ Template Metaprogramming sheds light on the most powerful idioms of today's C++, at long last delivering practical metaprogramming tools and techniques into the hands of the everyday programmer. A metaprogram is a program that generates or manipulates program code. Ever since generic programming was introduced to C++, programmers have discovered myriad "template tricks" for manipulating programs as they are compiled, effectively eliminating the barrier between program and metaprogram. While excitement among C++ experts about these capabilities has reached the community at large, their practical application remains out of reach for most programmers. This book explains what metaprogramming is and how it is best used. It provides the foundation you'll need to use the template metaprogramming effectively in your own work. This book is aimed at any programmer who is comfortable with idioms of the Standard Template Library (STL). C++ power-users will gain a new insight into their existing work and a new fluency in the domain of metaprogramming. Intermediate-level programmers who have learned a few advanced template techniques will see where these tricks fit in the big picture and will gain the conceptual foundation to use them with discipline. Programmers who have caught the scent of metaprogramming, but for whom it is still mysterious, will finally gain a clear understanding of how, when, and why it works. All readers will leave with a new tool of unprecedented power at their disposal—the Boost Metaprogramming Library. Note: CD materials are only available with the print edition.

Set in Canada and the battlefields of France and Belgium, Three-Day Road is a mesmerizing novel told through the eyes of Niska—a Canadian Oji-Cree woman living off the land who is the last of a line of healers and diviners—and her nephew Xavier. At the urging of his friend Elijah, a Cree boy raised in reserve schools, Xavier joins the war effort. Shipped off to Europe when they are nineteen, the boys are marginalized from the Canadian soldiers not only by their native appearance but also by the fine marksmanship that years of hunting in the bush has taught them. Both become snipers renowned for their uncanny accuracy. But while Xavier struggles to understand the purpose of the war and to come to terms with his conscience for the many lives he has ended, Elijah becomes obsessed with killing, taking great risks to become the most accomplished sniper in the army. Eventually the harrowing and bloody truth of war takes its toll on the two friends in different, profound ways. Intertwined with this account is the story of Niska, who herself has borne witness to a lifetime of death—the death of her people. In part inspired by the legend of Francis Pegahmagabow, the great Indian sniper of World War I, Three-Day Road is an impeccably researched and beautifully written story that offers a searing reminder about the cost of war.

This book covers both the theory and practice of game engine software development, bringing together complete coverage of a wide range of topics. The concepts and techniques described are the actual ones used by real game studios like Electronic Arts and Naughty Dog. The examples are often grounded in specific technologies, but the discussion extends way beyond any particular engine or API. The references and citations make it a great jumping off point for those who wish to dig deeper into any particular aspect of the game development process. Intended as the text for a college level series in game programming, this book can also be used by amateur software engineers, hobbyists, self-taught game programmers, and existing members of the game industry. Junior game engineers can use it to solidify their understanding of game technology and engine architecture. Even senior engineers who specialize in one particular field of game development can benefit from the bigger picture presented in these pages.

The Hitchhiker's Guide to Python takes the journeyman Pythonista to true expertise. More than any other language, Python was created with the philosophy of simplicity and parsimony. Now 25 years old, Python has become the primary or secondary language (after SQL) for many

business users. With popularity comes diversity—and possibly dilution. This guide, collaboratively written by over a hundred members of the Python community, describes best practices currently used by package and application developers. Unlike other books for this audience, The Hitchhiker's Guide is light on reusable code and heavier on design philosophy, directing the reader to excellent sources that already exist.

This book explains what metaprogramming is and how it is best used. It provides the foundation you'll need to use the template metaprogramming effectively in your own work. This book is aimed at any programmer who is comfortable with idioms of the Standard Template Library (STL). C++ power-users will gain a new insight into their existing work and a new fluency in the domain of metaprogramming. Intermediate-level programmers who have learned a few advanced template techniques will see where these tricks fit in the big picture and will gain the conceptual foundation to use them with discipline. Programmers who have caught the scent of metaprogramming, but for whom it is still mysterious, will finally gain a clear understanding of how, when, and why it works. All readers will leave with a new tool of unprecedented power at their disposal - the Boost Metaprogramming Library.

Build Your Own Distributed Compilation Cluster is a collected volume of my article series of the same name. Throughout the 6 in-depth how-to articles, I'll take you through the process of building a fully working cross-compilation distributed build system. The canonical example is of building a distributed ARM to X86-64 cross-compilation cluster. This system is also generic enough to apply to most any compilation environment, while remaining powerful enough to outperform all but the most advanced compilation systems. With source code examples provided and easy step by step instructions, this 60+ page instructional eBook is a valuable introductory and practical resource for those interested in distributed compilation, cross compilation, low power computing clusters, and so much more. It's also one terrific bargain, and an excellent reference.

Learn effective C++ network programming with Boost.Asio and become a proficient C++ network programmer About This Book Learn efficient C++ network programming with minimum coding using Boost.Asio Your one-stop destination to everything related to the Boost.Asio library Explore the fundamentals of networking to choose designs with more examples, and learn the basics of Boost.Asio Who This Book Is For This book is for C++ Network programmers with basic knowledge of network programming, but no knowledge of how to use Boost.Asio for network programming. What You Will Learn Prepare the tools to simplify network programming in C++ using Boost.Asio Explore the networking concepts of IP addressing, TCP/IP ports and protocols, and LAN topologies Get acquainted with the usage of the Boost libraries Get to know more about the content of Boost.Asio network programming and Asynchronous programming Establish communication between client and server by creating client-server application Understand the various functions inside Boost.Asio C++ libraries to delve into network programming Discover how to debug and run the code successfully In Detail Boost.Asio is a C++ library used for network programming operations. Organizations use Boost because of its productivity. Use of these high-quality libraries speed up initial development, result in fewer bugs, reduce reinvention-of-the-wheel, and cut long-term maintenance costs. Using Boost libraries gives an organization a head start in adopting new technologies. This book will teach you C++ Network programming using synchronous and asynchronous operations in Boost.Asio with minimum code, along with the fundamentals of Boost, server-client applications, debugging, and more. You will begin by preparing and setting up the required tools to simplify your network programming in C++ with Boost.Asio. Then you will learn about the basic concepts in networking such as IP addressing, TCP/IP protocols, and LAN with its topologies. This will be followed by an overview of the Boost libraries and their usage. Next you will get to know more about Boost.Asio and its concepts related to network programming. We will then go on to create a client-server application, helping you to

understand the networking concepts. Moving on, you will discover how to use all the functions inside the Boost.Asio C++ libraries. Lastly, you will understand how to debug the code if there are errors found and will run the code successfully. Style and approach An example-oriented book to show you the basics of networking and help you create a network application simply using Boost.Asio, with more examples for you to get up and running with Boost.Asio quickly. The Boost C++ LibrariesBoris Schäling

Learn Bosque Programming helps you to get acquainted with the regularized programming paradigm and how it is applied in Bosque. You'll learn how to write programs and apply the key and unique features that make Bosque an attractive alternative for developers who seek improved productivity without having to worry about side-effects.

This book constitutes the thoroughly refereed post-conference proceedings of the Joint International Conference on Pervasive Computing and Web Society, ICPCA/SWS 2013, held in Vina de Mar, Chile, in December 2013. The 56 revised full papers presented together with 29 poster papers were carefully reviewed and selected from 156 submissions. The papers are organized in topical sections on infrastructure and devices; service and solution; data and knowledge; as well as community.

Filled with dozens of working code examples that illustrate the use of over 40 popular Boost libraries, this book takes you on a tour of Boost, helping you to independently build the libraries from source and use them in your own code. The first half of the book focuses on basic programming interfaces including generic containers and algorithms, strings, resource management, exception safety, and a miscellany of programming utilities that make everyday programming chores easy. Following a short interlude that introduces template metaprogramming and functional programming, the later chapters are devoted to systems programming interfaces, focusing on directory handling, I/O, concurrency, and network programming

Libraries have always played a special role in times of disaster by continuing to provide crucial information and services.

Data clustering is a highly interdisciplinary field, the goal of which is to divide a set of objects into homogeneous groups such that objects in the same group are similar and objects in different groups are quite distinct. Thousands of theoretical papers and a number of books on data clustering have been published over the past 50 years. However,

OpenGL® SuperBible, Fifth Edition is the definitive programmer's guide, tutorial, and reference for the world's leading 3D API for real-time computer graphics, OpenGL 3.3. The best all-around introduction to OpenGL for developers at all levels of experience, it clearly explains both the API and essential associated programming concepts. Readers will find up-to-date, hands-on guidance on all facets of modern OpenGL development, including transformations, texture mapping, shaders, advanced buffers, geometry management, and much more. Fully revised to reflect ARB's latest official specification (3.3), this edition also contains a new start-to-finish tutorial on OpenGL for the iPhone, iPod touch, and iPad. Coverage includes A practical introduction to the essentials of real-time 3D graphics Core OpenGL 3.3 techniques for rendering, transformations, and texturing Writing your own shaders, with examples to get you started Cross-platform OpenGL: Windows (including Windows 7), Mac OS X, GNU/Linux, UNIX, and embedded systems OpenGL programming for iPhone, iPod touch, and iPad: step-by-step guidance and complete example programs Advanced buffer techniques, including

full-definition rendering with floating point buffers and textures Fragment operations: controlling the end of the graphics pipeline Advanced shader usage and geometry management A fully updated API reference, now based on the official ARB (Core) OpenGL 3.3 manual pages New bonus materials and sample code on a companion Web site, www.starstonesoftware.com/OpenGL Part of the OpenGL Technical Library—The official knowledge resource for OpenGL developers The OpenGL Technical Library provides tutorial and reference books for OpenGL. The Library enables programmers to gain a practical understanding of OpenGL and shows them how to unlock its full potential. Originally developed by SGI, the Library continues to evolve under the auspices of the OpenGL Architecture Review Board (ARB) Steering Group (now part of the Khronos Group), an industry consortium responsible for guiding the evolution of OpenGL and related technologies.

Hailed as a "must-have textbook" (CHOICE, January 2010), the first edition of Game Engine Architecture provided readers with a complete guide to the theory and practice of game engine software development. Updating the content to match today's landscape of game engine architecture, this second edition continues to thoroughly cover the major components that make up a typical commercial game engine. New to the Second Edition Information on new topics, including the latest variant of the C++ programming language, C++11, and the architecture of the eighth generation of gaming consoles, the Xbox One and PlayStation 4 New chapter on audio technology covering the fundamentals of the physics, mathematics, and technology that go into creating an AAA game audio engine Updated sections on multicore programming, pipelined CPU architecture and optimization, localization, pseudovectors and Grassman algebra, dual quaternions, SIMD vector math, memory alignment, and anti-aliasing Insight into the making of Naughty Dog's latest hit, The Last of Us The book presents the theory underlying various subsystems that comprise a commercial game engine as well as the data structures, algorithms, and software interfaces that are typically used to implement them. It primarily focuses on the engine itself, including a host of low-level foundation systems, the rendering engine, the collision system, the physics simulation, character animation, and audio. An in-depth discussion on the "gameplay foundation layer" delves into the game's object model, world editor, event system, and scripting system. The text also touches on some aspects of gameplay programming, including player mechanics, cameras, and AI. An awareness-building tool and a jumping-off point for further learning, Game Engine Architecture, Second Edition gives readers a solid understanding of both the theory and common practices employed within each of the engineering disciplines covered. The book will help readers on their journey through this fascinating and multifaceted field.

Covers all aspects of programming using the C++ language, including objects and classes, data structures, the standard library, lambda expressions, templates, and debugging.

An Essential Reference for Intermediate and Advanced R Programmers Advanced R presents useful tools and techniques for attacking many types of R programming problems, helping you avoid mistakes and dead ends. With more than ten years of experience programming in R, the author illustrates the elegance, beauty, and flexibility at the heart of R. The book develops the necessary skills to produce quality code that can be used in a variety of circumstances. You will learn: The fundamentals of R, including standard data types and functions Functional programming as a useful framework for solving wide classes of problems The positives and

negatives of metaprogramming How to write fast, memory-efficient code This book not only helps current R users become R programmers but also shows existing programmers what's special about R. Intermediate R programmers can dive deeper into R and learn new strategies for solving diverse problems while programmers from other languages can learn the details of R and understand why R works the way it does.

This book provides comprehensive coverage of ovject-oriented programming in Visual C++, including several major integrated case studies: the GradeBook class, the Time class, the Employee class and the potional OOD/UML- the industry-standard object-oriented system modeling language.

You can choose several data access frameworks when building Java enterprise applications that work with relational databases. But what about big data? This hands-on introduction shows you how Spring Data makes it relatively easy to build applications across a wide range of new data access technologies such as NoSQL and Hadoop. Through several sample projects, you'll learn how Spring Data provides a consistent programming model that retains NoSQL-specific features and capabilities, and helps you develop Hadoop applications across a wide range of use-cases such as data analysis, event stream processing, and workflow. You'll also discover the features Spring Data adds to Spring's existing JPA and JDBC support for writing RDBMS-based data access layers. Learn about Spring's template helper classes to simplify the use of database-specific functionality Explore Spring Data's repository abstraction and advanced query functionality Use Spring Data with Redis (key/value store), HBase (column-family), MongoDB (document database), and Neo4j (graph database) Discover the GemFire distributed data grid solution Export Spring Data JPA-managed entities to the Web as RESTful web services Simplify the development of HBase applications, using a lightweight object-mapping framework Build example big-data pipelines with Spring Batch and Spring Integration

The Best-Selling C++ Resource Now Updated for C++11 The C++ standard library provides a set of common classes and interfaces that greatly extend the core C++ language. The library, however, is not self-explanatory. To make full use of its components–and to benefit from their power–you need a resource that does far more than list the classes and their functions. The C++ Standard Library: A Tutorial and Reference, Second Edition, describes this library as now incorporated into the new ANSI/ISO C++ language standard (C++11). The book provides comprehensive documentation of each library component, including an introduction to its purpose and design; clearly written explanations of complex concepts; the practical programming details needed for effective use; traps and pitfalls; the exact signature and definition of the most important classes and functions; and numerous examples of working code. The book focuses in particular on the Standard Template Library (STL), examining containers, iterators, function objects, and STL algorithms. The book covers all the new C++11 library components, including Concurrency Fractional arithmetic Clocks and timers Tuples New STL containers New STL algorithms New smart pointers New locale facets Random numbers and distributions Type traits and utilities Regular expressions The book also examines the new C++ programming style and its effect on the standard library, including lambdas, range-based for loops, move semantics, and variadic templates. An accompanying Web site, including source code, can be found at www.cppstdlib.com.

Today, software engineers need to know not only how to program effectively but also how to develop proper engineering practices to make their codebase sustainable and healthy. This book emphasizes this difference between programming and software engineering. How can software engineers manage a living codebase that evolves and responds to changing requirements and demands over the length of its life? Based on their experience at Google, software engineers Titus Winters and Hyrum Wright, along with technical writer Tom Manshreck, present a candid and insightful look at how some of the world's leading

practitioners construct and maintain software. This book covers Google's unique engineering culture, processes, and tools and how these aspects contribute to the effectiveness of an engineering organization. You'll explore three fundamental principles that software organizations should keep in mind when designing, architecting, writing, and maintaining code: How time affects the sustainability of software and how to make your code resilient over time How scale affects the viability of software practices within an engineering organization What trade-offs a typical engineer needs to make when evaluating design and development decisions

The Boost Graph Library (BGL) is the first C++ library to apply the principles of generic programming to the construction of the advanced data structures and algorithms used in graph computations. Problems in such diverse areas as Internet packet routing, molecular biology, scientific computing, and telephone network design can be solved by using graph theory. This book presents an in-depth description of the BGL and provides working examples designed to illustrate the application of BGL to these real-world problems. Written by the BGL developers, The Boost Graph Library: User Guide and Reference Manual gives you all the information you need to take advantage of this powerful new library. Part I is a complete user guide that begins by introducing graph concepts, terminology, and generic graph algorithms. This guide also takes the reader on a tour through the major features of the BGL; all motivated with example problems. Part II is a comprehensive reference manual that provides complete documentation of all BGL concepts, algorithms, and classes. Readers will find coverage of: Graph terminology and concepts Generic programming techniques in C++ Shortest-path algorithms for Internet routing Network planning problems using the minimum-spanning tree algorithms BGL algorithms with implicitly defined graphs BGL Interfaces to other graph libraries BGL concepts and algorithms BGL classes–graph, auxiliary, and adaptor Groundbreaking in its scope, this book offers the key to unlocking the power of the BGL for the C++ programmer looking to extend the reach of generic programming beyond the Standard Template Library.

This is a book about learning by doing and is aimed at programmers familiar with programming, but not C++. The key exercises are not simply listed at the end of the chapter, but are integrated into the main text. Readers work hands-on throughout the book. Each lesson poses numerous questions, asking readers to write answers directly in the book. The book includes answers to all questions, so readers can check their work. These exercises are not simple cookbook-style recipes (e.g., "Write a program to do xyz"). Instead, they are explorations—structured labs that guide readers through a series of steps to highlight specific features of C++.

API Design for C++ provides a comprehensive discussion of Application Programming Interface (API) development, from initial design through implementation, testing, documentation, release, versioning, maintenance, and deprecation. It is the only book that teaches the strategies of C++ API development, including interface design, versioning, scripting, and plug-in extensibility. Drawing from the author's experience on large scale, collaborative software projects, the text offers practical techniques of API design that produce robust code for the long term. It presents patterns and practices that provide real value to individual developers as well as organizations. API Design for C++ explores often overlooked issues, both technical and non-technical, contributing to successful design decisions that product high quality, robust, and long-lived APIs. It focuses on various API styles and patterns that will allow you to produce elegant and durable libraries. A discussion on testing strategies concentrates on automated API testing techniques rather than attempting to include end-user application testing techniques such as GUI testing, system testing, or manual testing. Each concept is illustrated with extensive C++ code examples, and fully functional examples and working source code for experimentation are available online. This book will be helpful to new programmers who understand the fundamentals of C++ and who want to advance their design

skills, as well as to senior engineers and software architects seeking to gain new expertise to complement their existing talents. Three specific groups of readers are targeted: practicing software engineers and architects, technical managers, and students and educators. The only book that teaches the strategies of C++ API development, including design, versioning, documentation, testing, scripting, and extensibility. Extensive code examples illustrate each concept, with fully functional examples and working source code for experimentation available online. Covers various API styles and patterns with a focus on practical and efficient designs for large-scale long-term projects.

Summary Functional Programming in C++ teaches developers the practical side of functional programming and the tools that C++ provides to develop software in the functional style. This in-depth guide is full of useful diagrams that help you understand FP concepts and begin to think functionally. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Well-written code is easier to test and reuse, simpler to parallelize, and less error prone. Mastering the functional style of programming can help you tackle the demands of modern apps and will lead to simpler expression of complex program logic, graceful error handling, and elegant concurrency. C++ supports FP with templates, lambdas, and other core language features, along with many parts of the STL. About the Book Functional Programming in C++ helps you unleash the functional side of your brain, as you gain a powerful new perspective on C++ coding. You'll discover dozens of examples, diagrams, and illustrations that break down the functional concepts you can apply in C++, including lazy evaluation, function objects and invokables, algebraic data types, and more. As you read, you'll match FP techniques with practical scenarios where they offer the most benefit. What's inside Writing safer code with no performance penalties Explicitly handling errors through the type system Extending C++ with new control structures Composing tasks with DSLs About the Reader Written for developers with two or more years of experience coding in C++. About the Author Ivan ?uki? is a core developer at KDE and has been coding in C++ since 1998. He teaches modern C++ and functional programming at the Faculty of Mathematics at the University of Belgrade. Table of Contents Introduction to functional programming Getting started with functional programming Function objects Creating new functions from the old ones Purity: Avoiding mutable state Lazy evaluation Ranges Functional data structures Algebraic data types and pattern matching Monads Template metaprogramming Functional design for concurrent systems Testing and debugging

DocBook is a system for writing structured documents using SGML and XML. DocBook provides all the elements you'll need for technical documents of all kinds. A number of computer companies use DocBook for their documentation, as do several Open Source documentation groups, including the Linux Documentation Project (LDP). With the consistent use of DocBook, these groups can readily share and exchange information. With an XML-enabled browser, DocBook documents are as accessible on the Web as in print. DocBook : The Definitive Guide is the complete and official documentation of the DocBook Document Type Definition (DTD) and many of its associated tools. In this book, you'll find : A brief introduction to SGML and XML ; a guide to creating documents with the DocBook DTD and associated stylesheets. Information about using SGML and XML tools like jade and DSSSL ; a guide to customizing DocBook ; a complete SGML and XML reference, including examples, for every DocBook element. In addition, the CD-ROM contains the complete source text of this book, in both SGML and HTML ; all

the examples from the book ; DSSSL stylesheets that let you convert DocBook documents to RTF, LaTeX, or HTML ; The DocBook DTD for SGML, version 3*1 ; The DocBk DTD for XML, version 3*1*5. In an era of collaborative creation of technology, when information is needed online as often as in print, DocBook is the essential. documentation environment. "DocBook : The Definitive Guide" is the one essential source of information about that environment.

This report provides Association of College and Research Libraries (ACRL) leaders and the academic community with a clear view of the current state of the literature on value of libraries within an institutional context, suggestions for immediate "Next Steps" in the demonstration of academic library value, and a "Research Agenda" for articulating academic library value. Its focus is to help librarians understand, based on professional literature, the current answer to the question, "How does the library advance the missions of the institution?" This report is also of interest to higher educational professionals external to libraries, including senior leaders, administrators, faculty, and student affairs professionals.

"We finally have the definitive treatise on PyTorch! It covers the basics and abstractions in great detail. I hope this book becomes your extended reference document." —Soumith Chintala, co-creator of PyTorch Key Features Written by PyTorch's creator and key contributors Develop deep learning models in a familiar Pythonic way Use PyTorch to build an image classifier for cancer detection Diagnose problems with your neural network and improve training with data augmentation Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About The Book Every other day we hear about new ways to put deep learning to good use: improved medical imaging, accurate credit card fraud detection, long range weather forecasting, and more. PyTorch puts these superpowers in your hands. Instantly familiar to anyone who knows Python data tools like NumPy and Scikit-learn, PyTorch simplifies deep learning without sacrificing advanced features. It's great for building quick models, and it scales smoothly from laptop to enterprise. Deep Learning with PyTorch teaches you to create deep learning and neural network systems with PyTorch. This practical book gets you to work right away building a tumor image classifier from scratch. After covering the basics, you'll learn best practices for the entire deep learning pipeline, tackling advanced projects as your PyTorch skills become more sophisticated. All code samples are easy to explore in downloadable Jupyter notebooks. What You Will Learn Understanding deep learning data structures such as tensors and neural networks Best practices for the PyTorch Tensor API, loading data in Python, and visualizing results Implementing modules and loss functions Utilizing pretrained models from PyTorch Hub Methods for training networks with limited inputs Sifting through unreliable results to diagnose and fix problems in your neural network Improve your results with augmented data, better model architecture, and fine tuning This Book Is Written For For Python programmers with an interest in machine learning. No experience with PyTorch or other deep learning frameworks is required. About The Authors Eli Stevens has worked in Silicon Valley for the past 15 years as a software engineer, and the past 7 years as Chief Technical Officer of a startup making medical device software. Luca Antiga is co-founder and CEO of an AI engineering company located in Bergamo, Italy, and a regular contributor to PyTorch. Thomas Viehmann is a Machine Learning and PyTorch speciality trainer

and consultant based in Munich, Germany and a PyTorch core developer. Table of Contents PART 1 - CORE PYTORCH 1 Introducing deep learning and the PyTorch Library 2 Pretrained networks 3 It starts with a tensor 4 Real-world data representation using tensors 5 The mechanics of learning 6 Using a neural network to fit the data 7 Telling birds from airplanes: Learning from images 8 Using convolutions to generalize PART 2 - LEARNING FROM IMAGES IN THE REAL WORLD: EARLY DETECTION OF LUNG CANCER 9 Using PyTorch to fight cancer 10 Combining data sources into a unified dataset 11 Training a classification model to detect suspected tumors 12 Improving training with metrics and augmentation 13 Using segmentation to find suspected nodules 14 End-to-end nodule analysis, and where to go next PART 3 - DEPLOYMENT 15 Deploying to production

Designed for the way many developers work, this practical problem-solving guide balances the need for rapid development with a trusted source of information. Scripting with Python makes you productive and increases the reliability of your scientific work. Here, the author teaches you how to develop tailored, flexible, and efficient working environments built from small programs (scripts) written in Python. The focus is on examples and applications of relevance to computational science: gluing existing applications and tools, e.g. for automating simulation, data analysis, and visualization; steering simulations and computational experiments; equipping programs with graphical user interfaces; making computational Web services; creating interactive interfaces with a Maple/Matlab-like syntax to numerical applications in C/C++ or Fortran; and building flexible object-oriented programming interfaces to existing C/C++ or Fortran libraries.

Over 25 hands-on recipes to create robust and highly-efficient cross-platform distributed applications with the Boost.Asio library About This Book Build highly efficient distributed applications with ease Enhance your cross-platform network programming skills with one of the most reputable C++ libraries Find solutions to real-world problems related to network programming with ready-to-use recipes using this detailed and practical handbook Who This Book Is For If you want to enhance your C++ network programming skills using the Boost.Asio library and understand the theory behind development of distributed applications, this book is just what you need. The prerequisite for this book is experience with general C++11. To get the most from the book and comprehend advanced topics, you will need some background experience in multithreading. What You Will Learn Boost your working knowledge of one of the most reputable C++ networking libraries—Boost.Asio Familiarize yourself with the basics of TCP and UDP protocols Create scalable and highly-efficient client and server applications Understand the theory behind development of distributed applications Increase the security of your distributed applications by adding SSL support Implement a HTTP client easily Use iostreams, scatter-gather buffers, and timers In Detail Starting with recipes demonstrating the execution of basic Boost.Asio operations, the book goes on to provide ready-to-use implementations of client and server applications from simple synchronous ones to powerful multithreaded scalable solutions. Finally, you are presented with advanced topics such as implementing a chat application, implementing an HTTP client, and adding SSL support. All the samples presented in the book are ready to be used in real projects just out of the box. As well as excellent practical examples, the book also includes extended supportive theoretical material on

distributed application design and construction. Style and approach This book is a set of recipes, each containing the statement and description of a particular practical problem followed by code sample providing the solution to the problem and detailed step-by-step explanation. Recipes are grouped by topic into chapters and ordered by the level of complexity from basic to advanced.

The second edition of The Boost C++ Libraries introduces 72 Boost libraries that provide a wide range of useful capabilities. They help you manage memory and process strings more easily. They provide containers and other data structures that go well beyond what the standard library offers. They make it easy to build platform-independent network applications. Simply put, these 72 libraries greatly expand your C++ toolbox. The second edition contains more than 430 examples. All examples are as short as possible, but they are complete, so you can compile and run them as is. They show you what the Boost libraries offer and give you a head start on using the libraries in your own applications. The goal of this book is to increase your efficiency as a C++ developer and to simplify software development with C++. The Boost libraries introduced in this book will help you write less code with fewer bugs and finish projects faster. You code will be more concise and self-explanatory and more easily adapted when requirements change. The second edition is based on the Boost libraries 1.55.0 and 1.56.0 with the latter version having been released in August 2014. The examples are based on C++11 and have been tested with Visual Studio 2013, GCC 4.8 and Clang 3.3 on various platforms. For Boost libraries which were incorporated into the C++11 standard library, differences between Boost and the standard library are highlighted. The Boost libraries are one of the most important and influential open source C++ libraries. Their source code is available under a permissive free software license. Several Boost libraries have been incorporated into the C++11 standard library. The Boost libraries are developed and supported by the Boost community - a worldwide developer community with a strong interest in pushing C++ boundaries further. Introducing the Boost libraries: the next breakthrough in C++ programming Boost takes you far beyond the C++ Standard Library, making C++ programming more elegant, robust, and productive. Now, for the first time, a leading Boost expert systematically introduces the broad set of Boost libraries and teaches best practices for their use. Writing for intermediate-to-advanced C++ developers, Björn Karlsson briefly outlines all 58 Boost libraries, and then presents comprehensive coverage of 12 libraries you're likely to find especially useful. Karlsson's topics range from smart pointers and conversions to containers and data structures, explaining exactly how using each library can improve your code. He offers detailed coverage of higher-order function objects that enable you to write code that is more concise, expressive, and readable. He even takes you "behind the scenes" with Boost, revealing tools and techniques for creating your own generic libraries. Coverage includes Smart pointers that provide automatic lifetime management of objects and simplify resource sharing Consistent, best-practice solutions for performing type conversions and lexical conversions Utility classes that make programming simpler and clearer Flexible container libraries that solve common problems not covered by the C++ Standard Library Powerful support for regular expressions with Boost.Regex Function objects defined at the

call site with Boost.Bind and Boost.Lambda More flexible callbacks with Boost.Function Managed signals and slots (a.k.a. the Observer pattern) with Boost.Signals The Boost libraries are proving so useful that many of them are planned for inclusion in the next version of the C++ Standard Library. Get your head start now, with Beyond the C++ Standard Library.

A fast-paced, thorough introduction to modern C++ written for experienced programmers. After reading C++ Crash Course, you'll be proficient in the core language concepts, the C++ Standard Library, and the Boost Libraries. C++ is one of the most widely used languages for real-world software. In the hands of a knowledgeable programmer, C++ can produce small, efficient, and readable code that any programmer would be proud of. Designed for intermediate to advanced programmers, C++ Crash Course cuts through the weeds to get you straight to the core of C++17, the most modern revision of the ISO standard. Part 1 covers the core of the C++ language, where you'll learn about everything from types and functions, to the object life cycle and expressions. Part 2 introduces you to the C++ Standard Library and Boost Libraries, where you'll learn about all of the high-quality, fully-featured facilities available to you. You'll cover special utility classes, data structures, and algorithms, and learn how to manipulate file systems and build high-performance programs that communicate over networks. You'll learn all the major features of modern C++, including: • Fundamental types, reference types, and user-defined types • The object lifecycle including storage duration, memory management, exceptions, call stacks, and the RAII paradigm • Compile-time polymorphism with templates and run-time polymorphism with virtual classes • Advanced expressions, statements, and functions • Smart pointers, data structures, dates and times, numerics, and probability/statistics facilities • Containers, iterators, strings, and algorithms • Streams and files, concurrency, networking, and application development With well over 500 code samples and nearly 100 exercises, C++ Crash Course is sure to help you build a strong C++ foundation.

Introduces programmers to the generic programming paradigm and to the C++ Standard Template Library and its use as an extensible framework for generic and interoperable components. Explains ideas underlying generic programming and shows how to create algorithms decoupled from the types and data structures they operate on, and how to write more efficient code that can be used and reused across platforms. Assumes familiarity with C++ and algorithms. Annotation copyrighted by Book News, Inc., Portland, OR

In this new and improved third edition of the highly popular Game Engine Architecture, Jason Gregory draws on his nearly two decades of experience at Midway, Electronic Arts and Naughty Dog to present both the theory and practice of game engine software development. In this book, the broad range of technologies and techniques used by AAA game studios are each explained in detail, and their roles within a real industrial-strength game engine are illustrated. New to the Third Edition This third edition offers the same comprehensive

coverage of game engine architecture provided by previous editions, along with updated coverage of: computer and CPU hardware and memory caches, compiler optimizations, C++ language standardization, the IEEE-754 floating-point representation, 2D user interfaces, plus an entirely new chapter on hardware parallelism and concurrent programming. This book is intended to serve as an introductory text, but it also offers the experienced game programmer a useful perspective on aspects of game development technology with which they may not have deep experience. As always, copious references and citations are provided in this edition, making it an excellent jumping off point for those who wish to dig deeper into any particular aspect of the game development process. Key Features Covers both the theory and practice of game engine software development Examples are grounded in specific technologies, but discussion extends beyond any particular engine or API. Includes all mathematical background needed. Comprehensive text for beginners and also has content for senior engineers.

This book is the follow-up of the Boost Volume I book and it has been written for software developers who use Boost C++ libraries to create flexible applications. We discuss approximately 20 advanced libraries that can be classified into the following major categories: Mathematics: special functions, statistical distributions, interval arithmetic and matrix algebra. Special data structures: date and time, circular buffer, UUID, dynamic bitsets, pool memory. TCP and UDP portable network programming using the software interface. Interprocess communication and shared memory programming models. Three chapters on graphs, graph algorithms and their implementation in Boost. The focus is hands-on and each library is discussed in detail and numerous working examples are given to get the reader up to speed as soon as possible. Each library is described in a step-by-step fashion and you can use the corresponding code as a basis for more advanced applications. These libraries are the ideal basis for new applications. We shall use them in Volume III of the current series when we discuss applications to engineering, science and computational finance. About the Authors Robert Demming is software designer, developer and trainer and he has been involved with software projects in the areas of optical technology, process control, CAD and order processing systems since 1993. He has a BSc degree in technical computerscience from Amsterdam Hogeschool. Daniel J. Duffy is founder of Datasim Education BV and has been working with C++ and its applications since 1989 and with software development since 1979. He is designer, algorithm builder and trainer. He has a PhD in numerical analysis from Trinity College, Dublin. One of the projects that he is involved in is applying the Boost libraries to computational finance."

C++ High Performance, Second Edition enables you to measure and identify bottlenecks in the code and eradicate them to amplify your application's working speed without compromising the readability of your C++ codebase

Learn to build applications faster and better by leveraging the real power of Boost

and C++ About This Book Learn to use the Boost libraries to simplify your application development Learn to develop high quality, fast and portable applications Learn the relations between Boost and C++11/C++4/C++17 Who This Book Is For This book is for developers looking to improve their knowledge of Boost and who would like to simplify their application development processes. Prior C++ knowledge and basic knowledge of the standard library is assumed. What You Will Learn Get familiar with new data types for everyday use Use smart pointers to manage resources Get to grips with compile-time computations and assertions Use Boost libraries for multithreading Learn about parallel execution of different task Perform common string-related tasks using Boost libraries Split all the processes, computations, and interactions to tasks and process them independently Learn the basics of working with graphs, stacktracing, testing and interprocess communications Explore different helper macros used to detect compiler, platform and Boost features In Detail If you want to take advantage of the real power of Boost and C++ and avoid the confusion about which library to use in which situation, then this book is for you. Beginning with the basics of Boost C++, you will move on to learn how the Boost libraries simplify application development. You will learn to convert data such as string to numbers, numbers to string, numbers to numbers and more. Managing resources will become a piece of cake. You'll see what kind of work can be done at compile time and what Boost containers can do. You will learn everything for the development of high quality fast and portable applications. Write a program once and then you can use it on Linux, Windows, MacOS, Android operating systems. From manipulating images to graphs, directories, timers, files, networking – everyone will find an interesting topic. Be sure that knowledge from this book won't get outdated, as more and more Boost libraries become part of the C++ Standard.

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