Beginning Rust From Novice To Professional

The official book on the Rust programming language, written by the Rust development team at the Mozilla Foundation, fully updated for Rust 2018. The Rust Programming Language is the official book on Rust: an open source systems programming language that helps you write faster, more reliable software. Rust offers control over low-level details (such as memory usage) in combination with high-level ergonomics, eliminating the hassle traditionally associated with low-level languages. The authors of The Rust Programming Language, members of the Rust Core Team, share their knowledge and experience to show you how to take full advantage of Rust's features--from installation to creating robust and scalable programs. You'll begin with basics like creating functions, choosing data types, and binding variables and then move on to more advanced concepts, such as: • Ownership and borrowing, lifetimes, and traits • Using Rust's memory safety guarantees to build fast, safe programs • Testing, error handling, and effective refactoring • Generics, smart pointers, multithreading, trait objects, and advanced pattern matching • Using Cargo, Rust's built-in package manager, to build, test, and document your code and manage dependencies • How best to use Rust's advanced compiler with compiler-led programming techniques You'll find plenty of code examples throughout the book, as well as three chapters dedicated to building complete projects to test your learning: a number guessing game, a Rust implementation of a command line tool, and a multithreaded server. New to this edition: An extended section on Rust macros, an expanded chapter on modules, and appendixes on Rust development tools and editions.

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Explore the support Rust offers for creating functional applications in Rust. Learn about various design patterns, implementing concurrency, metaprogramming, and so on in the process Key Features Learn generics, organization, and design patterns in functional programming Modularize your applications and make them highly reusable and testable using functional design patterns Get familiar with complex concepts such as metaprogramming, concurrency, and immutability Book Description Functional programming allows developers to divide programs into smaller, reusable components that ease the creation, testing, and maintenance of software as a whole. Combined with the power of Rust, you can develop robust and scalable applications that fulfill modern day software requirements. This book will help you discover all the Rust features that can be used to build software in a functional way. We begin with a brief comparison of the functional and object-oriented approach to different problems and patterns. We then quickly look at the patterns of control flow, data the abstractions of these unique to functional programming. The next part covers how to create functional apps in Rust; mutability and ownership, which are exclusive to Rust, are also discussed. Pure functions are examined next and you'll master closures, their various types, and currying. We also look at implementing concurrency through functional design principles and metaprogramming using macros. Finally, we look at best practices for debugging and optimization. By the end of the book, you will be familiar with the functional approach of programming and will be able to use these techniques on a daily basis. What you will learn How Rust supports the use of basic functional programming principles Use functional programming to handle concurrency with elegance Read and interpret complex type signatures for types and functions Implement powerful abstractions using meta programming in Rust Create quality code formulaically using Rust's functional design patterns Master Rust's complex ownership mechanisms particularly for mutability Who this book is for This book is for Rust developers who are comfortable with the language and now want to improve their coding abilities by learning advanced functional techniques to enhance their skillset and create robust and testable apps.

An environmental journalist traces the historical war against rust, revealing how rust-related damage costs more than all other natural disasters combined and how it is combated by industrial workers, the government, universities and everyday people.

Systems programming provides the foundation for the world's computation. Writing performance-sensitive code requires a programming language that puts programmers in control of how memory, processor time, and other system resources are used. The Rust systems programming language combines that control with a modern type system that catches broad classes of common mistakes, from memory management errors to data races between threads. With this practical guide, experienced systems programmers will learn how to successfully bridge the gap between performance and safety using Rust. Jim Blandy, Jason Orendorff, and Leonora Tindall demonstrate how Rust's features put programmers in control over memory consumption and processor use by combining predictable performance with memory safety and trustworthy concurrency. You'll learn: Rust's fundamental data types and the core concepts of ownership and borrowing How to write flexible, efficient code with traits and generics How to write fast, multithreaded code without data races Rust's key power tools: closures, iterators, and asynchronous programming Collections, strings and text, input and output, macros, unsafe code, and foreign function interfaces This revised, updated edition covers the Rust 2021 Edition.

You've experienced the shiny, point-and-click surface of your Linux computer—now dive below and explore its depths with the power of the command line. The Linux Command Line takes you from your very first terminal keystrokes to writing full programs in Bash, the most popular Linux shell. Along the way you'll learn the timeless skills handed down by generations of gray-bearded, mouse-shunning gurus: file navigation, environment configuration, command chaining, pattern matching with regular expressions, and more. In addition to that practical knowledge, author William Shotts reveals the philosophy behind these tools and the rich heritage that your desktop Linux machine has inherited from Unix supercomputers of yore. As you make your way through the book's short, easily-digestible chapters, you'll learn how to: * Create and delete files, directories, and symlinks * Administer your system, including networking, package installation, and process management * Use standard input and output, redirection, and pipelines * Edit files with Vi, the world’s most popular text editor * Write shell scripts to automate common or boring tasks * Slice and dice text files with cut, paste, grep, patch, and sed Once you overcome your initial "shell shock," you'll find that the command line is a natural and expressive way to communicate with your computer. Just don't be surprised if your mouse starts to gather dust. A featured resource in the Linux Foundation's "Evolution of a SysAdmin"

Sharpen your coding skills by exploring established computer science problems! Classic Computer Science Problems in Java challenges you with time-tested scenarios and algorithms. Summary Sharpen your coding skills by exploring established computer science problems! Classic Computer Science Problems in Java challenges you with time-tested scenarios and algorithms. You’ll work through a series of exercises based in computer science fundamentals that are designed to improve your software development abilities, improve your understanding of artificial intelligence, and even prepare you to ace an interview. As you work through examples in search, clustering, graphs, and more, you'll remember important things you've forgotten and discover classic solutions to your "new" problems! Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Whatever software development problem you’re facing, odds are someone has already uncovered a solution. This book collects the most useful solutions devised, guiding you through a variety of challenges and tried-and-true problem-solving techniques. The principles and algorithms presented here are guaranteed to save you countless hours in project after project. About the book Classic Computer Science Problems in Java is a master class in computer programming designed around 55 exercises that have been used in computer science classrooms for years. You’ll work through hands-on examples as you explore core algorithms, constraint problems, AI applications, and much more. What's inside Recursion, memoization, and bit manipulation Search, graph, and genetic algorithms Constraint-satisfaction problems K-means clustering, neural networks, and adversarial search About the

reader For intermediate Java programmers. About the author David Kopec is an assistant professor of Computer Science and Innovation at Champlain College in Burlington, Vermont. Table of Contents 1 Small problems 2 Search problems 3 Constraint-satisfaction problems 4 Graph problems 5 Genetic algorithms 6 K-means clustering 7 Fairly simple neural networks 8 Adversarial search 9 Miscellaneous problems 10 Interview with Brian Goetz

Get familiar with writing programs in the trending new systems programming language that brings together the powerful performance of low-level languages with the advanced features like thread safety in multi-threaded code Key Features Learn the semantics of Rust, which can be significantly different from other programming languages Understand clearly how to work with the Rust compiler which strictly enforces rules that may not be obvious Examples and insights beyond the Rust documentation Book Description Rust is an emerging programming language applicable to areas such as embedded programming, network programming, system programming, and web development. This book will take you from the basics of Rust to a point where your code compiles and does what you intend it to do! This book starts with an introduction to Rust and how to get set for programming, including the rustup and cargo tools for managing a Rust installation and development workflow. Then you'll learn about the fundamentals of structuring a Rust program, such as functions, mutability, data structures, implementing behavior for types, and many more. You will also learn about concepts that Rust handles differently from most other languages. After understanding the Basics of Rust programming, you will learn about the core ideas, such as variable ownership, scope, lifetime, and borrowing. After these key ideas, you will explore making decisions in Rust based on data types by learning about match and if let expressions. After that, you'll work with different data types in Rust, and learn about memory management and smart pointers. What you will learn Install Rust and write your first program with it Understand ownership in Rust Handle different data types Make decisions by pattern matching Use smart pointers Use generic types and type specialization Write code that works with many data types Tap into the standard library Who this book is for This book is for people who are new to Rust, either as their first programming language or coming to it from somewhere else. Familiarity with computer programming in any other language will be helpful in getting the best out of this book.

This is not your typical programming book! Jump right in with interesting, useful programs, some of which are drawn from classic computer science problems as a way of talking about the programming constructs in the language rather than explaining everything in a dry, theoretical manner that doesn’t translate well to implementation. Rust programming has been the "most loved programming language" in the Stack Overflow Developer Survey every year since 2016! Learn why programmers are using Rust due to it's performance and efficency, without the errors and crashes that a programmer would find in common languages such as C and C++. Built around solving real problems, this book will help introduce you to computer science problems that can be built upon to create solutions for other problems. LEARN BY DOING: This book will focus on a practical approach to learing Rust. You will learn all of the language fundamentals through the use of programming examples that do interesting things! All of the programs covered will be based on a computer science problem or othre interesting problems that can be used as a foundation for demonstrating language syntax, data types and structures, and other features or techniques for developing programs.

Learn to program with Rust in an easy, step-by-step manner on Unix, Linux shell, macOS and the Windows command line. As you read this book, you’ll build on the knowledge you gained in previous chapters and see what Rust has to offer. Beginning Rust starts with the basics of Rust, including how to name objects, control execution flow, and handle primitive types. You’ll see how to do arithmetic, allocate memory, use iterators, and handle input/output. Once you have mastered these core skills, you’ll work on handling errors and using the object-oriented features of Rust to build robust Rust applications in no time. Only a basic knowledge of programming is required, preferably in C or C++. To understand this book, it's enough to know what integers and floating-point numbers are, and to distinguish identifiers from string literals. After reading this book, you'll be ready to build Rust applications. What You'll Learn Get started programming with Rust Understand heterogeneous data structures and data sequences Define functions, generic functions, structs, and more Work with closures, changeable strings, ranges and slices Use traits and learn about lifetimes Who This Book Is For Those who are new to Rust and who have at least some prior experience with programming in general: some C/C++ is recommended particularly.

This book provides the reader with a comprehensive overview of the new open source programming language Go (in its first stable and maintained release Go 1) from Google. The language is devised with Java / C#-like syntax so as to feel familiar to the bulk of programmers today, but Go code is much cleaner and simpler to read, thus increasing the productivity of developers. You will see how Go: simplifies programming with slices, maps, structs and interfaces incorporates functional programming makes error-handling easy and secure simplifies concurrent and parallel programming with goroutines and channels And you will learn how to: make use of Go's excellent standard library program Go the idiomatic way using patterns and best practices in over 225 working examples and 135 exercises This book focuses on the aspects that the reader needs to take part in the coming software revolution using Go.

Go beyond the basics and build complete applications using the Rust programming language. The applications in this book include a high-performance web client, a microcontroller (for a robot, for example), a game, an app that runs on Android, and an application that incorporates AI and machine learning. Each chapter will be organized in the following format: what this kind of application looks like; requirements and user stories of our example program; an introduction to the Rust libraries used; the actual implementation of the example program, including common pitfalls and their solutions; and a brief comparison of libraries for building each application, if there is no clear winner. Practical Rust Projects will open your eyes to the world of practical applications of Rust. After reading the book, you will be able to apply your Rust knowledge to build your own projects. What You Will Learn Write Rust code that runs on microcontrollers Build a 2D game Create Rust-based mobile Android applications Use Rust to build AI and machine learning applications Who This Book Is For Someone with basic Rust knowledge, wishing to learn more about how to apply Rust in a real-world scenario.

Get started programming Rust applications for the Internet of Things (IoT). This book is a programming skills migration book that teaches you the Rust programming techniques most useful for IoT applications. You'll step through from server to board development in creating a set of IoT applications. In Rust for the IoT, you'll learn how to build a modern server side application using Rust on the backend. Then you'll use docker and Kubernetes to deploy these to a managed cloud. Finally you will use a Raspberry Pi with a SenseHat and Camera to capture the world around you and send that information to the cloud. While you will be able to follow along without any cloud or hardware, to make the

most of it we recommend a few cloud pieces and hardware that is designed to integrate with the software in this book. After reading and using this book, you'll see how to apply Rust to the Internet of Things. What You Will Learn Create a modern Rust backend complete with handling eventual consistency and interacting via a GraphQL interface Use the Raspberry PI to serve as a cheap IoT device that one can easily deploy around the house Capture temperature, video, and use the interactive joystick to interact with the software you've created Use OpenCV to perform facial detection from the PI's camera and save that information to the cloud. Create deployable helm charts for the cloud, and for the device create complete ISOs that allow you to easily deploy the Pi's OS + custom software Who This Book Is For You will need to have a basic understanding of cloud application development at a minimum and the basics of Rust coding. This book is for those interested in or working with the IoT and the Raspberry Pi who want to learn how Rust can work for them.

The Go Workshop takes you from being a novice Go programmer to a confident developer who can leverage the key features of the language to build real-world applications. This book helps you cut through excessive theory and delve into the practical features and techniques that are commonly applied to design performant, scalable applications.

Drowning in unnecessary complexity, unmanaged state, and tangles of spaghetti code? In the best tradition of Lisp, Clojure gets out of your way so you can focus on expressing simple solutions to hard problems. Clojure cuts through complexity by providing a set of composable tools--immutable data, functions, macros, and the interactive REPL. Written by members of the Clojure core team, this book is the essential, definitive guide to Clojure. This new edition includes information on all the newest features of Clojure, such as transducers and specs. Clojure joins the flexibility and agility of Lisp with the reach, stability, and performance of Java. Combine Clojure's tools for maximum effectiveness as you work with immutable data, functional programming, and safe concurrency to write programs that solve real-world problems. Start by reading and understanding Clojure syntax and see how Clojure is evaluated. From there, find out about the sequence abstraction, which combines immutable collections with functional programming to create truly reusable data transformation code. Clojure is a functional language; learn how to write programs in a functional style, and when and how to use recursion to your advantage. Discover Clojure's unique approach to state and identity, techniques for polymorphism and open systems using multimethods and protocols, and how to leverage Clojure's metaprogramming capabilities via macros. Finally, put all the pieces together in a real program. New to this edition is coverage of Clojure's spec library, one of the most interesting new features of Clojure for describing both data and functions. You can use Clojure spec to validate data, destructure data, explain invalid data, and generate large numbers of tests to verify the correctness of your code. With this book, you'll learn how to think in Clojure, and how to take advantage of its combined strengths to build powerful programs quickly. What You Need: Java 6 or higher Clojure 1.9

Data Pipelines with Apache Airflow teaches you the ins-and-outs of the Directed Acyclic Graphs (DAGs) that power Airflow, and how to write your own DAGs to meet the needs of your projects. With complete coverage of both foundational and lesser-known features, when you're done you'll be set to start using Airflow for seamless data pipeline development and management. Pipelines can be challenging to manage, especially when your data has to flow through a collection of application components, servers, and cloud services. Airflow lets you schedule, restart, and backfill pipelines, and its easy-to-use UI and workflows with Python scripting has users praising its incredible flexibility. Data Pipelines with Apache Airflow takes you through best practices for creating pipelines for multiple tasks, including data lakes, cloud deployments, and data science. Data Pipelines with Apache Airflow teaches you the ins-and-outs of the Directed Acyclic Graphs (DAGs) that power Airflow, and how to write your own DAGs to meet the needs of your projects. With complete coverage of both foundational and lesser-known features, when you're done you'll be set to start using Airflow for seamless data pipeline development and management. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications.

Design and implement professional-level programs by leveraging modern data structures and algorithms in Rust Key Features Improve your productivity by writing more simple and easy code in Rust Discover the functional and reactive implementations of traditional data structures Delve into new domains of Rust, including WebAssembly, networking, and command-line tools Book Description Rust is a powerful language with a rare combination of safety, speed, and zero-cost abstractions. This Learning Path is filled with clear and simple explanations of its features along with real-world examples, demonstrating how you can build robust, scalable, and reliable programs. You'll get started with an introduction to Rust data structures, algorithms, and essential language constructs. Next, you will understand how to store data using linked lists, arrays, stacks, and queues. You'll also learn to implement sorting and searching algorithms, such as Brute Force algorithms, Greedy algorithms, Dynamic Programming, and Backtracking. As you progress, you'll pick up on using Rust for systems programming, network programming, and the web. You'll then move on to discover a variety of techniques, right from writing memory-safe code, to building idiomatic Rust libraries, and even advanced macros. By the end of this Learning Path, you'll be able to implement Rust for enterprise projects, writing better tests and documentation, designing for performance, and creating idiomatic Rust code. This Learning Path includes content from the following Packt products: Mastering Rust - Second Edition by Rahul Sharma and Vesa Kaihlavirta Hands-On Data Structures and Algorithms with Rust by Claus Matzinger What you will learn Design and implement complex data structures in Rust Create and use well-tested and reusable components with Rust Understand the basics of multithreaded programming and advanced algorithm design Explore application profiling based on benchmarking and testing Study and apply best practices and strategies in error handling Create efficient web applications with the Actix-web framework Use Diesel for type-safe database interactions in your web application Who this book is for If you are already familiar with an imperative language and now want to progress from being a beginner to an intermediate-level Rust programmer, this Learning Path is for you. Developers who are already familiar with Rust and want to delve

deeper into the essential data structures and algorithms in Rust will also find this Learning Path useful.
Build projects on exciting topics like game development, virtual reality, web assembly, emulators, GUI, and Linux/kernel development. By the end of the book, you will know how to choose the right framework or library for your needs.
Unlock the groundbreaking advances of deep learning with this extensively revised new edition of the bestselling original. Learn directly from the creator of Keras and master practical Python deep learning techniques that are easy to apply in the real world. In Deep Learning with Python, Second Edition you will learn: Deep learning from first principles Image classification and image segmentation Timeseries forecasting Text classification and machine translation Text generation, neural style transfer, and image generation Deep Learning with Python has taught thousands of readers how to put the full capabilities of deep learning into action. This extensively revised second edition introduces deep learning using Python and Keras, and is loaded with insights for both novice and experienced ML practitioners. You'll learn practical techniques that are easy to apply in the real world, and important theory for perfecting neural networks. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Recent innovations in deep learning unlock exciting new software capabilities like automated language translation, image recognition, and more. Deep learning is quickly becoming essential knowledge for every software developer, and modern tools like Keras and TensorFlow put it within your reach—even if you have no background in mathematics or data science. This book shows you how to get started. About the book Deep Learning with Python, Second Edition introduces the field of deep learning using Python and the powerful Keras library. In this revised and expanded new edition, Keras creator François Chollet offers insights for both novice and experienced machine learning practitioners. As you move through this book, you'll build your understanding through intuitive explanations, crisp illustrations, and clear examples. You'll quickly pick up the skills you need to start developing deep-learning applications. What's inside Deep learning from first principles Image classification and image segmentation Time series forecasting Text classification and machine translation Text generation, neural style transfer, and image generation About the reader For readers with intermediate Python skills. No previous experience with Keras, TensorFlow, or machine learning is required. About the author François Chollet is a software engineer at Google and creator of the Keras deep-learning library. Table of Contents 1 What is deep learning? 2 The mathematical building blocks of neural networks 3 Introduction to Keras and TensorFlow 4 Getting started with neural networks: Classification and regression 5 Fundamentals of machine learning 6 The universal workflow of machine learning 7 Working with Keras: A deep dive 8 Introduction to deep learning for computer vision 9 Advanced deep learning for computer vision 10 Deep learning for timeseries 11 Deep learning for text 12 Generative deep learning 13 Best practices for the real world 14 Conclusions
Pandas has rapidly become one of Python's most popular data analysis libraries. With pandas you can efficiently sort, analyze, filter and munge almost any type of data. Pandas in Action shows you how to master this versatile tool and take the next steps in your data science career. Pandas has rapidly become one of Python's most popular data analysis libraries. With pandas you can efficiently sort, analyze, filter and munge almost any type of data. Pandas in Action shows you how to master this versatile tool and take the next steps in your data science career. Pandas in Action makes it easy to dive into Python-based data analysis. You'll learn to use pandas to automate repetitive spreadsheet functionality and derive insight from data by sorting columns, filtering data subsets, and creating multi-leveled indices. Each chapter is a self-contained tutorial, letting you dip in when you need to troubleshoot tricky problems. Best of all, you won't be learning from sterile or randomly created data. You'll start with a variety of datasets that are big, small, incomplete, broken, and messy and learn how to clean and format them for proper analysis. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications.
Summary F# Deep Dives presents a collection of real-world F# techniques, each written by expert practitioners. Each chapter presents a new use case where you'll read how the author used F# to solve a complex problem more effectively than would have been possible using a traditional approach. You'll not only see how a specific solution works in a specific domain, you'll also learn how F# developers approach problems, what concepts they use to solve them, and how they integrate F# into existing systems and environments. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology F# is an elegant, cross-platform, functional-first programming language. With F#, developers create consistent and predictable programs that are easier to test and reuse, simpler to parallelize, and less prone to bugs. The language, its tooling, and the functional programming style have proven effective in many application areas like secure financial engines, machine learning algorithms, scientific calculations, collaborative web applications, games, and more. About the Book F# Deep Dives is a selection of real-world F# techniques written by expert practitioners. Each chapter presents an important use case where you'll solve a real programming challenge effectively using F# and the functional-first approach. Not only will you see how a specific solution works in a specific domain, but you'll also learn how functional programmers think about problems, how they solve them, and how they integrate F# into existing systems and environments. Readers should have at least an introductory knowledge of the F# language. What's Inside Numerical computing Data visualization Business logic Domain-specific languages Practical solutions to real problems Information-rich programming, including LINQ and F# type providers Covers F# 3.1 and VS 2013 About the Authors Tomas Petricek contributed to the development of the F# language at Microsoft Research. Phil Trelford is an early adopter of F# and one of its most vocal advocates. They are joined by F# experts Chris Ballard, Keith Battocchi, Colin Bull, Chao-Jen Chen, Yan Cui, Johann Deneux, Kit Eason, Evelina Gabasova, Dmitry Morozov, and Don Syme. Table of Contents Succeeding with functional-first languages in the industry PART 1 INTRODUCTION Calculating cumulative binomial distributions Parsing text-

based languages PART 2 DEVELOPING ANALYTICAL COMPONENTS Numerical computing in the financial domain Understanding social networks Integrating stock data into the F# language PART 3 DEVELOPING COMPLETE SYSTEMS Developing rich user interfaces using the MVC pattern Asynchronous and agent-based programming Creating games using XNA Building social web applications PART 4 F# IN THE LARGER CONTEXT F# in the enterprise Software quality

Summary Get Programming with JavaScript is a hands-on introduction to programming for readers who have never programmed. You'll be writing your own web apps, games, and programs in no time! Foreword by Remy Sharp. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Book Are you ready to start writing your own web apps, games, and programs? You’re in the right place! Get Programming with JavaScript is a hands-on introduction to programming for readers who have never written a line of code. Since you’re just getting started, this friendly book offers you lots of examples backed by careful explanations. As you go along, you’ll find exercises to check your understanding and plenty of opportunities to practice your new skills. You don’t need anything special to follow the examples—just the text editor and web browser already installed on your computer. We even give you links to working online code so you can see how everything should look live on your screen. What’s Inside All the basics—objects, functions, responding to users, and more Think like a coder and design your own programs Create a text-based adventure game Enhance web pages with JavaScript Run your programs in a web browser Four bonus chapters available online About the Reader No experience required! All you need is a web browser and an internet connection. About the Author John Larsen is a mathematics and computing teacher with an interest in educational research. He has an MA in mathematics and an MSc in information technology. He started programming in 1982, writing simple programs for teaching mathematics in 1993, building websites in 2001, and developing data-driven web-based applications for education in 2006. Table of Contents PART 1 CORE CONCEPTS ON THE CONSOLE Programming, JavaScript, and JS Bin Variables: storing data in your program Objects: grouping your data Functions: code on demand Arguments: passing data to functions Return values: getting data from functions Object arguments: functions working with objects Arrays: putting data into lists Constructors: building objects with functions Bracket notation: flexible property names PART 2 ORGANIZING YOUR PROGRAMS Scope: hiding information Conditions: choosing code to run Modules: breaking a program into pieces Models: working with data Views: displaying data Controllers: linking models and views PART 3 JAVASCRIPT IN THE BROWSER HTML: building web pages Controls: getting user input Templates: filling placeholders with data XHR: loading data Conclusion: get programming with JavaScript BONUS ONLINE CHAPTERS Node: running JavaScript outside the browser Express: building an API Polling: repeating requests with XHR Socket.IO: real-time messaging

This is an extensive and beginner-friendly Rust tutorial prepared by our system programming team here at Apriorit. Whether you're a Rust aficionado or only starting your Rust journey, this e-book undoubtedly will prove useful to you. Key Highlights ? Discover the main features of the Rust language ? Learn to develop safer and faster software using Rust ? Learn to establish efficient C bindings ? Get detailed explanations of differences between Rust and C++ Book Description Rust is a c-like systems programming language that provides many advantages over its predecessors. This is why this low-level language has already become so popular in the development community. This book covers the main features of Rust, like zero-cost abstractions, move semantics, trait-based generics, pattern matching, type inference, and minimal runtime. It also explains how the Rust programming language can ensure memory safety and avoid data races in threads. In addition, Rust provides a great opportunity to use wide range of libraries and bind with other languages. The author added a detailed chart comparing feature set of Rust to C++, so you can better understand all the advantages and disadvantages of Rust. This tutorial will be useful for developers who only starts learning Rust, as well as for those who want to improve their knowledge on Rust features. What you will learn ? Discover Rust features that make programming faster and secure ? Guarantee memory safety using Rust ? Benefit from zero-cost abstraction mechanisms ? Avoid data races and a garbage collector ? Get rid of use-after-free, double-free bugs, dangling pointers ? Reduce code duplication ? Use existing libraries written in C and other languages ? Understand the main difference between Rust and C++ About the Author Alexey Lozovsky is a Software Designer at Apriorit.Inc. Apriorit Inc. is a software development service provider headquartered in the Dover, DE, US, with several development centers in Eastern Europe. With over 350 professionals, it brings high-quality services on software consulting, research, and development to software vendors and IT companies worldwide. Apriorit’s main specialties are cybersecurity and data management projects, where system programming, driver and kernel level development, research and reversing matter. The company has an independent web platform development department focusing on building cloud platforms for business. Table of Contents Introduction Summary of Features Rust Language Features Zero-Cost Abstractions Move Semantics Guaranteed Memory Safety Ownership Borrowing Mutability and Aliasing Option Types instead of Null Pointers No Uninitialized Variables Threads without Data Races Passing Messages with Channels Safe State Sharing with Locks Trait-Based Generics Traits Define Type Interfaces Traits Implement Polymorphism Traits May be Implemented Automatically Pattern Matching Type Inference Minimal Runtime Efficient C Bindings Calling C from Rust The Libc Crate and Unsafe Blocks Beyond Primitive Types Calling Rust from C Rust vs. C++ Comparison

Discover the Ballerina programming language for next-generation microservices and native cloud application development. This book shows you that Ballerina is a cutting-edge programming language, which incorporates many of the latest technological advancements in programming language theory. You'll learn variables and types, modules and functions, flow control, error handling, concurrency, I/O, cloud/network programming, persistence and data access, security and more. Additionally, Beginning Ballerina Programming introduces many foundation computer science topics along the way and doesn’t assume much prior knowledge. For example, when introducing transport-level

security, you will get a brief introduction to public-key cryptography, how it is different from private-key cryptography, and why we need it. This provides an added bonus for you to learn something new and general in computer science. After reading and using this book, you'll be proficient with Ballerina and cloud-first programming and apply these concepts and techniques to your next cloud application developments. What You'll Learn Start programming with Ballerina Gain the basics of network communication and programming Obtain a solid understanding of services/API development and resilient communication Discover cloud-native technologies using Ballerina Deploy to the cloud using Ballerina Who This Book Is For Absolute beginners in computer programming: No prior experience with computer programming is expected. This can also be a reference book for experienced developers in other languages, who want to learn a modern programming language.

The C++11 standard allows programmers to express ideas more clearly, simply, and directly, and to write faster, more efficient code. Bjarne Stroustrup, the designer and original implementer of C++, thoroughly covers the details of this language and its use in his definitive reference, The C++ Programming Language, Fourth Edition. In A Tour of C++ , Stroustrup excerpts the overview chapters from that complete reference, expanding and enhancing them to give an experienced programmer–in just a few hours–a clear idea of what constitutes modern C++. In this concise, self-contained guide, Stroustrup covers most major language features and the major standard-library components–not, of course, in great depth, but to a level that gives programmers a meaningful overview of the language, some key examples, and practical help in getting started. Stroustrup presents the C++ features in the context of the programming styles they support, such as object-oriented and generic programming. His tour is remarkably comprehensive. Coverage begins with the basics, then ranges widely through more advanced topics, including many that are new in C++11, such as move semantics, uniform initialization, lambda expressions, improved containers, random numbers, and concurrency. The tour ends with a discussion of the design and evolution of C++ and the extensions added for C++11. This guide does not aim to teach you how to program (see Stroustrup’s Programming: Principles and Practice Using C++ for that); nor will it be the only resource you’ll need for C++ mastery (see Stroustrup’s The C++ Programming Language, Fourth Edition, for that). If, however, you are a C or C++ programmer wanting greater familiarity with the current C++ language, or a programmer versed in another language wishing to gain an accurate picture of the nature and benefits of modern C++, you can’t find a shorter or simpler introduction than this tour provides.

Rust is an exciting new programming language combining the power of C with memory safety, fearless concurrency, and productivity boosters - and what better way to learn than by making games. Each chapter in this book presents hands-on, practical projects ranging from "Hello, World" to building a full dungeon crawler game. With this book, you'll learn game development skills applicable to other engines, including Unity and Unreal. Rust is an exciting programming language combining the power of C with memory safety, fearless concurrency, and productivity boosters. With Rust, you have a shiny new playground where your game ideas can flourish. Each chapter in this book presents hands-on, practical projects that take you on a journey from "Hello, World" to building a full dungeon crawler game. Start by setting up Rust and getting comfortable with your development environment. Learn the language basics with practical examples as you make your own version of Flappy Bird. Discover what it takes to randomly generate dungeons and populate them with monsters as you build a complete dungeon crawl game. Run game systems concurrently for high-performance and fast game-play, while retaining the ability to debug your program. Unleash your creativity with magical items, tougher monsters, and intricate dungeon design. Add layered graphics and polish your game with style. What You Need: A computer running Windows 10, Linux, or Mac OS X. A text editor, such as Visual Studio Code. A video card and drivers capable of running OpenGL 3.2.

The Go Programming Language is the authoritative resource for any programmer who wants to learn Go. It shows how to write clear and idiomatic Go to solve real-world problems. The book does not assume prior knowledge of Go nor experience with any specific language, so you’ll find it accessible whether you’re most comfortable with JavaScript, Ruby, Python, Java, or C++. The first chapter is a tutorial on the basic concepts of Go, introduced through programs for file I/O and text processing, simple graphics, and web clients and servers. Early chapters cover the structural elements of Go programs: syntax, control flow, data types, and the organization of a program into packages, files, and functions. The examples illustrate many packages from the standard library and show how to create new ones of your own. Later chapters explain the package mechanism in more detail, and how to build, test, and maintain projects using the go tool. The chapters on methods and interfaces introduce Go’s unconventional approach to object-oriented programming, in which methods can be declared on any type and interfaces are implicitly satisfied. They explain the key principles of encapsulation, composition, and substitutability using realistic examples. Two chapters on concurrency present in-depth approaches to this increasingly important topic. The first, which covers the basic mechanisms of goroutines and channels, illustrates the style known as communicating sequential processes for which Go is renowned. The second covers more traditional aspects of concurrency with shared variables. These chapters provide a solid foundation for programmers encountering concurrency for the first time. The final two chapters explore lower-level features of Go. One covers the art of metaprogramming using reflection. The other shows how to use the unsafe package to step outside the type system for special situations, and how to use the cgo tool to create Go bindings for C libraries. The book features hundreds of interesting and practical examples of well-written Go code that cover the whole language, its most important packages, and a wide range of applications. Each chapter has exercises to test your understanding and explore extensions and alternatives. Source code is freely available for download from http://gopl.io/ and may be conveniently fetched, built, and installed using the go get command.

Learn the principles behind object-oriented programming and within a few chapters create a fully functional Ruby application. You'll also gain a basic understanding of many ancillary technologies such as databases, XML, web frameworks, and networking - some of which are needed as part of a fully functioning Ruby application. Based on the

bestselling first and second editions, Beginning Ruby, Third Edition is a leading guide to learn Ruby from the ground up. The new edition of this book provides the same excellent introduction to Ruby as the previous editions plus updates for the newest version of Ruby 2.3. This book can also be used as a textbook or companion to a textbook on beginning Ruby programming. The light and agile Ruby programming language remains a very popular open source scripting option for developers building today's web and even some enterprise applications. And, now, Ruby also has applications using the Raspberry Pi, popular among hobbyists and makers. Many former Java developers still use Ruby on Rails today, the most popular framework for building Ruby applications. What You'll Learn Discover the fundamentals of Ruby and its object-oriented building blocks Use the Ruby libraries, gems, and documentation Work with files and databases Write and deploy Ruby applications Harness the various Ruby web frameworks and how to use them Do network programming with Ruby Who This Book Is For Beginning programmers, programmers new to Ruby, and web developers interested in learning and knowing the foundations of the Ruby programming language.

Summary Learn Linux in a Month of Lunches shows you how to install and use Linux for all the things you do with your OS, like connecting to a network, installing software, and securing your system. Whether you're just curious about Linux or have to get up and running for your job, you'll appreciate how this book concentrates on the tasks you need to know how to do in 23 easy lessons. About the Technology If you've only used Windows or Mac OS X, you may be daunted by the Linux operating system. And yet learning Linux doesn't have to be hard, and the payoff is great. Linux is secure, flexible, and free. It's less susceptible to malicious attacks, and when it is attacked, patches are available quickly. If you don't like the way it looks or behaves, you can change it. And best of all, Linux allows users access to different desktop interfaces and loads of software, almost all of it completely free. About the Book Learn Linux in a Month of Lunches shows you how to install and use Linux for all the things you do with your OS, like connecting to a network, installing software, and securing your system. Whether you're just curious about Linux or need it for your job, you'll appreciate how this book focuses on just the tasks you need to learn. In easy-to-follow lessons designed to take an hour or less, you'll learn how to use the command line, along with practical topics like installing software, customizing your desktop, printing, and even basic networking. You'll find a road map to the commands and processes you need to be instantly productive. What's Inside Master the command line Learn about file systems Understand desktop environments Go from Linux novice to expert in just one month About the Reader This book is for anyone looking to learn how to use Linux. No previous Linux experience required. About the Author Steven Ovadia is a professor and librarian at LaGuardia Community College, CUNY. He curates The Linux Setup, a large collection of interviews with desktop Linux users, and writes for assorted library science journals. Table of Contents PART 1 - GETTING LINUX UP AND RUNNING Before you begin Getting to know Linux Installing Linux Getting to know your system Desktop environments Navigating your desktop PART 2 - A HOME OFFICE IN LINUX Installing software An introduction to Linux home/office software Text files and editors Working with files and folders on the command line Working with common command-line applications, part 1 Working with common command-line applications, part 2 Using the command line productively Explaining the Linux filesystem hierarchy Windows programs in Linux Establishing a workflow PART 3 - HOME SYSTEM ADMIN ON LINUX An in-depth look at package management and maintenance Updating the operating system Linux security Connecting to other computers Printing Version control for non-programmers Never the end

Learn JavaScript from scratch! Packed with numerous examples, JavaScript: Novice to Ninja is a fun, step-by-step and comprehensive introduction to development in JavaScript. Discover how to use JavaScript to solve real-world problems, build smarter forms, track user events, and design eye-catching animations. Learn JavaScript's built-in functions, methods, and properties. Use JavaScript to validate form entries and interact with your users. Understand how to respond to user events and add interactivity to your applications. Create animations that bring your web site to life. Start programming using the DOM And much more!

Rust is a new and fast programming language that provides memory safety without a garbage collector. With its low memory footprint, it allows web developers to build high-performance and secure web apps with relative ease. This book will help web developers to adopt Rust for web app development, while addressing safety and high-performance issues.

Master professional-level coding in Rust. For developers who’ve mastered the basics, this book is the next step on your way to professional-level programming in Rust. It covers everything you need to build and maintain larger code bases, write powerful and flexible applications and libraries, and confidently expand the scope and complexity of your projects. Author Jon Gjengset takes you deep into the Rust programming language, dissecting core topics like ownership, traits, concurrency, and unsafe code. You’ll explore key concepts like type layout and trait coherence, delve into the inner workings of concurrent programming and asynchrony with async/await, and take a tour of the world of no_std programming. Gjengset also provides expert guidance on API design, testing strategies, and error handling, and will help develop your understanding of foreign function interfaces, object safety, procedural macros, and much more. You'll Learn: • How to design reliable, idiomatic, and ergonomic Rust programs based on best principles • Effective use of declarative and procedural macros, and the difference between them • How asynchrony works in Rust – all the way from the Pin and Waker types used in manual implementations of Futures, to how async/await saves you from thinking about most of those words • What it means for code to be unsafe, and best practices for writing and interacting with unsafe functions and traits • How to organize and configure more complex Rust projects so that they integrate nicely with the rest of the ecosystem • How to write Rust code that can interoperate with non-Rust libraries and systems, or run in constrained and embedded environments Brimming with practical, pragmatic insights that you can immediately apply, Rust for Rustaceans helps you do more with Rust, while also teaching you its underlying mechanisms.

Summary Getting MEAN, Second Edition teaches you how to develop full-stack web applications using the MEAN stack. This edition was completely revised and updated to cover MongoDB 4, Express 4, Angular 7, Node 11, and the latest mainstream release of JavaScript ES2015. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Juggling languages mid-application can radically slow down a full-stack web project. The MEAN stack—MongoDB, Express, Angular, and Node—uses JavaScript end to end, maximizing developer productivity and minimizing context switching. And you'll love the results! MEAN apps are fast, powerful, and beautiful. About the Book Getting MEAN, Second Edition teaches you how to develop full-stack web applications using the MEAN stack. Practical from the very beginning, the book helps you create a static site in Express and Node. Expanding on that solid foundation, you'll integrate a MongoDB database, build an API, and add an authentication system. Along the way, you'll get countless pro tips for building dynamic and responsive data-driven web applications! What's inside MongoDB 4, Express 4, Angular 7, and Node.js 11 MEAN stack architecture Mobile-ready web apps Best practices for efficiency and reusability About the Reader Readers should be comfortable with standard web application designs and ES2015-style JavaScript. About the Author Simon Holmes and Clive Harber are full-stack developers with decades of experience in JavaScript and other leading-edge web technologies. Table of Contents PART 1 - SETTING THE BASELINE Introducing full-stack development Designing a MEAN stack architecture PART 2 - BUILDING A NODE WEB APPLICATION Creating and setting up a MEAN project Building a static site with Node and Express Building a data model with MongoDB and Mongoose Writing a REST API: Exposing the MongoDB database to the application Consuming a REST API: Using an API from inside Express PART 3 - ADDING A DYNAMIC FRONT END WITH ANGULAR Creating an Angular application with TypeScript Building a single-page application with Angular: Foundations Building a single-page application with Angular: The next level PART 4 - MANAGING AUTHENTICATION AND USER SESSIONS Authenticating users, managing sessions, and securing APIs Using an authentication API in Angular applications

Computer Graphics from Scratch demystifies the algorithms used in modern graphics software and guides beginners through building photorealistic 3D renders. Computer graphics programming books are often math-heavy and intimidating for newcomers. Not this one. Computer Graphics from Scratch takes a simpler approach by keeping the math to a minimum and focusing on only one aspect of computer graphics, 3D rendering. You'll build two complete, fully functional renderers: a raytracer, which simulates rays of light as they bounce off objects, and a rasterizer, which converts 3D models into 2D pixels. As you progress you'll learn how to create realistic reflections and shadows, and how to render a scene from any point of view. Pseudocode examples throughout make it easy to write your renderers in any language, and links to live JavaScript demos of each algorithm invite you to explore further on your own. Learn how to: • Use perspective projection to draw 3D objects on a 2D plane • Simulate the way rays of light interact with surfaces • Add mirror-like reflections and cast shadows to objects • Render a scene from any camera position using clipping planes • Use flat, Gouraud, and Phong shading to mimic real surface lighting • Paint texture details onto basic shapes to create realistic-looking objects Whether you're an aspiring graphics engineer or a novice programmer curious about how graphics algorithms work, Gabriel Gambetta's simple, clear explanations will quickly put computer graphics concepts and rendering techniques within your reach. All you need is basic coding knowledge and high school math. Computer Graphics from Scratch will cover the rest.

Rust is a new systems programming language that combines the performance and low-level control of C and C++ with memory safety and thread safety. Rust's modern, flexible types ensure your program is free of null pointer dereferences, double frees, dangling pointers, and similar bugs, all at compile time, without runtime overhead. In multi-threaded code, Rust catches data races at compile time, making concurrency much easier to use. Written by two experienced systems programmers, this book explains how Rust manages to bridge the gap between performance and safety, and how you can take advantage of it. Topics include: How Rust represents values in memory (with diagrams) Complete explanations of ownership, moves, borrows, and lifetimes Cargo, rustdoc, unit tests, and how to publish your code on crates.io, Rust's public package repository High-level features like generic code, closures, collections, and iterators that make Rust productive and flexible Concurrency in Rust: threads, mutexes, channels, and atomics, all much safer to use than in C or C++ Unsafe code, and how to preserve the integrity of ordinary code that uses it Extended examples illustrating how pieces of the language fit together

Web frameworks are playing a major role in the creation of today's most compelling web applications, because they automate many of the tedious tasks, allowing developers to instead focus on providing users with creative and powerful features. Java developers have been particularly fortunate in this area, having been able to take advantage of Grails, an open source framework that supercharges productivity when building Java–driven web sites. Grails is based on Groovy, which is a very popular and growing dynamic scripting language for Java developers and was inspired by Python, Ruby, and Smalltalk. Beginning Groovy and Grails is the first introductory book on the Groovy language and its primary web framework, Grails. This book gets you started with Groovy and Grails and culminates in the example and possible application of some real–world projects. You follow along with the development of each project, implementing and running each application while learning new features along the way.

Rust in Action is a hands-on guide to systems programming with Rust. Written for inquisitive programmers, it presents real-world use cases that go far beyond syntax and structure. Summary Rust in Action introduces the Rust programming language by exploring numerous systems programming concepts and techniques. You'll be learning Rust by delving into how computers work under the hood. You'll find yourself playing with persistent storage, memory, networking and even tinkering with CPU instructions. The book takes you through using Rust to extend other applications and teaches you tricks to write blindingly fast code. You'll also discover parallel and concurrent programming. Filled to

the brim with real-life use cases and scenarios, you'll go beyond the Rust syntax and see what Rust has to offer in real-world use cases. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Rust is the perfect language for systems programming. It delivers the low-level power of C along with rock-solid safety features that let you code fearlessly. Ideal for applications requiring concurrency, Rust programs are compact, readable, and blazingly fast. Best of all, Rust’s famously smart compiler helps you avoid even subtle coding errors. About the book Rust in Action is a hands-on guide to systems programming with Rust. Written for inquisitive programmers, it presents real-world use cases that go far beyond syntax and structure. You’ll explore Rust implementations for file manipulation, networking, and kernel-level programming and discover awesome techniques for parallelism and concurrency. Along the way, you’ll master Rust’s unique borrow checker model for memory management without a garbage collector. What's inside Elementary to advanced Rust programming Practical examples from systems programming Command-line, graphical and networked applications About the reader For intermediate programmers. No previous experience with Rust required. About the author Tim McNamara uses Rust to build data processing pipelines and generative art. He is an expert in natural language processing and data engineering. Table of Contents 1 Introducing Rust PART 1 RUST LANGUAGE DISTINCTIVES 2 Language foundations 3 Compound data types 4 Lifetimes, ownership, and borrowing PART 2 DEMYSTIFYING SYSTEMS PROGRAMMING 5 Data in depth 6 Memory 7 Files and storage 8 Networking 9 Time and timekeeping 10 Processes, threads, and containers 11 Kernel 12 Signals, interrupts, and exceptions
Mastering Rust, Second Edition covers a comprehensive list of topics that will help you gain deeper insights into the language. It will allow you how to create high performing applications effortlessly.
Learn how to program using the updated C++17 language. You'll start with the basics and progress through step-by-step examples to become a working C++ programmer. All you need are Beginning C++17 and any recent C++ compiler and you'll soon be writing real C++ programs. There is no assumption of prior programming knowledge. All language concepts that are explained in the book are illustrated with working program examples, and all chapters include exercises for you to test and practice your knowledge. Code downloads are provided for all examples from the text and solutions to the exercises. This latest edition has been fully updated to the latest version of the language, C++17, and to all conventions and best practices of so-called modern C++. Beginning C++17 also introduces the elements of the C++ Standard Library that provide essential support for the C++17 language. What You'll Learn Define variables and make decisions Work with arrays and loops, pointers and references, strings, and more Write your own functions, types, and operators Discover the essentials of object-oriented programming Use overloading, inheritance, virtual functions and polymorphism Write generic function templates and class templates Get up to date with modern C++ features: auto type declarations, move semantics, lambda expressions, and more Examine the new additions to C++17 Who This Book Is For Programmers new to C++ and those who may be looking for a refresh primer on the C++17 programming language in general.
If you’re an experienced programmer who has not worked with Clojure before, this guide is the perfect thorough but gentle introduction for you. Author Carin Meier not only provides a practical overview of this JVM language and its functional programming concepts, but also includes a complete hands-on training course to help you learn Clojure in a structured way. The first half of the book takes you through Clojure’s unique design and lets you try your hand at two Clojure projects, including a web app. The holistic course in second half provides you with critical tools and resources, including ways to plug into the Clojure community. Understand the basic structure of a Clojure expression Learn how to shape and control code in a functional way Discover how Clojure handles real-world state and concurrency Take advantage of Java classes and learn how Clojure handles polymorphism Manage and use libraries in a Clojure project Use the core.async library for asynchronous and concurrent communication Explore the power of macros in Clojure programming Learn how to think in Clojure by following the book’s seven-week training course
The only way to master a skill is to practice. In Python Workout, author Reuven M. Lerner guides you through 50 carefully selected exercises that invite you to flex your programming muscles. As you take on each new challenge, you’ll build programming skill and confidence. Summary The only way to master a skill is to practice. In Python Workout, author Reuven M. Lerner guides you through 50 carefully selected exercises that invite you to flex your programming muscles. As you take on each new challenge, you’ll build programming skill and confidence. The thorough explanations help you lock in what you’ve learned and apply it to your own projects. Along the way, Python Workout provides over four hours of video instruction walking you through the solutions to each exercise and dozens of additional exercises for you to try on your own. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology To become a champion Python programmer you need to work out, building mental muscle with your hands on the keyboard. Each carefully selected exercise in this unique book adds to your Python prowess—one important skill at a time. About the book Python Workout presents 50 exercises that focus on key Python 3 features. In it, expert Python coach Reuven Lerner guides you through a series of small projects, practicing the skills you need to tackle everyday tasks. You’ll appreciate the clear explanations of each technique, and you can watch Reuven solve each exercise in the accompanying videos. What's inside 50 hands-on exercises and solutions Coverage of all Python data types Dozens more bonus exercises for extra practice About the reader For readers with basic Python knowledge. About the author Reuven M. Lerner teaches Python and data science to companies around the world. Table of Contents 1 Numeric types 2 Strings 3 Lists and tuples 4 Dictionaries and sets 5 Files 6 Functions 7 Functional programming with comprehensions 8 Modules and packages 9 Objects 10 Iterators and generators