Metaprogramming Elixir Write Less Code Get More Done And Have Fun

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Property-based testing helps you create better, more solid tests with little code. By using the PropEr framework in both Erlang and Elixir, this book teaches you how to automatically generate test cases, test stateful programs, and change how you design your software for more principled and reliable approaches. You will be able to better explore the problem space, validate the assumptions you make when coming up with program behavior, and expose unexpected weaknesses in your design. PropEr will even show you how to reproduce the bugs it found. With this book, you will be writing efficient property-based tests in no time. Most tests only demonstrate that the code behaves how the developer expected it to behave, and therefore carry the same blind spots as their authors when special conditions or edge cases show up. Learn how to see things differently with property tests written in PropEr. Start with the basics of property tests, such as writing stateless properties, and using the default generators to generate test cases automatically. More importantly, learn how to think in properties. Improve your properties, write custom data generators, and discover what your code can or cannot do. Learn when to use property tests and when to stick with example tests with real-world sample projects. Explore various testing approaches to find the one that's best for your code. Shrink failing test cases to their simpler expression to highlight exactly what breaks in your code, and generate highly relevant data through targeted properties. Uncover the trickiest bugs you can think of with nearly no code at all with two special types of properties based on state transitions and finite state machines. Write Erlang and Elixir properties that generate the most effective tests you'll see, whether they are unit tests or complex integration and system tests. What You Need Basic knowledge of Erlang, optionally Elixir For Erlang tests: Erlang/OTP >= 20.0, with Rebar >= 3.4.0 For Elixir tests: Erlang/OTP >= 20.0, Elixir >= 1.5.0

Give users the real-time experience they expect, by using Elixir and Phoenix Channels to build applications that instantly react to changes and reflect the application's true state. Learn how Elixir and Phoenix make it easy and enjoyable to create real-time applications that scale to a large number of users. Apply system design and development best practices to create applications that are easy to maintain. Gain confidence by learning how to break your applications before your users do. Deploy applications with minimized resource use and maximized performance. Real-time applications come with real challenges - persistent connections, multi-server deployment, and strict performance requirements are just a few. Don't try to solve these challenges by yourself - use a framework that handles them for you. Elixir and Phoenix Channels provide a solid foundation on which to build stable and scalable real-time applications. Build applications that thrive for years to come with the best-practices found in this book. Understand the magic of real-time communication by

inspecting the WebSocket protocol in action. Avoid performance pitfalls early in the development lifecycle with a catalog of common problems and their solutions. Leverage GenStage to build a data pipeline that improves scalability. Break your application before your users do and confidently deploy them. Build a real-world project using solid application design and testing practices that help make future changes a breeze. Create distributed apps that can scale to many users with tools like Phoenix Tracker. Deploy and monitor your application with confidence and reduce outages. Deliver an exceptional real-time experience to your users, with easy maintenance, reduced operational costs, and maximized performance, using Elixir and Phoenix Channels. What You Need: You'll need Elixir 1.9+ and Erlang/OTP 22+ installed on a Mac OS X, Linux, or Windows machine.

You've decided to tackle machine learning - because you're job hunting, embarking on a new project, or just think self-driving cars are cool. But where to start? It's easy to be intimidated, even as a software developer. The good news is that it doesn't have to be that hard. Master machine learning by writing code one line at a time, from simple learning programs all the way to a true deep learning system. Tackle the hard topics by breaking them down so they're easier to understand, and build your confidence by getting your hands dirty. Peel away the obscurities of machine learning, starting from scratch and going all the way to deep learning. Machine learning can be intimidating, with its reliance on math and algorithms that most programmers don't encounter in their regular work. Take a hands-on approach, writing the Python code yourself, without any libraries to obscure what's really going on. Iterate on your design, and add layers of complexity as you go. Build an image recognition application from scratch with supervised learning. Predict the future with linear regression. Dive into gradient descent, a fundamental algorithm that drives most of machine learning. Create perceptrons to classify data. Build neural networks to tackle more complex and sophisticated data sets. Train and refine those networks with backpropagation and batching. Layer the neural networks, eliminate overfitting, and add convolution to transform your neural network into a true deep learning system. Start from the beginning and code your way to machine learning mastery. What You Need: The examples in this book are written in Python, but don't worry if you don't know this language: you'll pick up all the Python you need very quickly. Apart from that, you'll only need your computer, and your code-adept brain.

Programming Language Explorations is a tour of several modern programming languages in use today. The book teaches fundamental language concepts using a language-by-language approach. As each language is presented, the authors introduce new concepts as they appear, and revisit familiar ones, comparing their implementation with those from languages seen in prior chapters. The goal is to present and explain common theoretical concepts of language design and usage, illustrated in the context of practical language overviews. Twelve languages have been carefully chosen to

illustrate a wide range of programming styles and paradigms. The book introduces each language with a common trio of example programs, and continues with a brief tour of its basic elements, type system, functional forms, scoping rules, concurrency patterns, and sometimes, metaprogramming facilities. Each language chapter ends with a summary, pointers to open source projects, references to materials for further study, and a collection of exercises, designed as further explorations. Following the twelve featured language chapters, the authors provide a brief tour of over two dozen additional languages, and a summary chapter bringing together many of the questions explored throughout the text. Targeted to both professionals and advanced college undergraduates looking to expand the range of languages and programming patterns they can apply in their work and studies, the book pays attention to modern programming practice, covers cutting-edge languages and patterns, and provides many runnable examples, all of which can be found in an online GitHub repository. The exploration style places this book between a tutorial and a reference, with a focus on the concepts and practices underlying programming language design and usage. Instructors looking for material to supplement a programming languages or software engineering course may find the approach unconventional, but hopefully, a lot more fun.

Elixir and Phoenix are generating tremendous excitement as an unbeatable platform for building modern web applications. For decades OTP has helped developers create incredibly robust, scalable applications with unparalleled uptime. Make the most of them as you build a stateful web app with Elixir, OTP, and Phoenix. Model domain entities without an ORM or a database. Manage server state and keep your code clean with OTP Behaviours. Layer on a Phoenix web interface without coupling it to the business logic. Open doors to powerful new techniques that will get you thinking about web development in fundamentally new ways. Elixir and OTP provide exceptional tools to build rock-solid back-end applications that scale. In this book, you'll build a web application in a radically different way, with a back end that holds application state. You'll use persistent Phoenix Channel connections instead of HTTP's request-response, and create the full application in distinct, decoupled layers. In Part 1, start by building the business logic as a separate application, without Phoenix. Model the application domain with Elixir functions and simple data structures. By keeping state in memory instead of a database, you can reduce latency and simplify your code. In Part 2, add in the GenServer Behaviour to make managing in-memory state a breeze. Create a supervision tree to boost fault tolerance while separating error handling from business logic. Phoenix is a modern web framework you can layer on top of business logic while keeping the two completely decoupled. In Part 3, you'll do exactly that as you build a web interface with Phoenix. Bring in the application from Part 2 as a dependency to a new Phoenix project. Then use ultra-scalable Phoenix Channels to establish persistent connections between the stateful server and a stateful front-end client. You're going to

love this way of building web apps! What You Need: You'll need a computer that can run Elixir version 1.5 or higher and Phoenix 1.3 or higher. Some familiarity with Elixir and Phoenix is recommended.

Making significant changes to large, complex codebases is a daunting task--one that's nearly impossible to do successfully unless you have the right team, tools, and mindset. If your application is in need of a substantial overhaul and you're unsure how to go about implementing those changes in a sustainable way, then this book is for you. Software engineer Maude Lemaire walks you through the entire refactoring process from start to finish. You'll learn from her experience driving performance and refactoring efforts at Slack during a period of critical growth, including two case studies illustrating the impact these techniques can have in the real world. This book will help you achieve a newfound ability to productively introduce important changes in your codebase. Understand how code degrades and why some degradation is inevitable Quantify and qualify the state of your codebase before refactoring Draft a well-scoped execution plan with strategic milestones Win support from engineering leadership Build and coordinate a team best suited for the project Communicate effectively inside and outside your team Adopt best practices for successfully executing the refactor

Great programmers aren't born--they're made. The industry is moving from object-oriented languages to functional languages, and you need to commit to radical improvement. New programming languages arm you with the tools and idioms you need to refine your craft. While other language primers take you through basic installation and "Hello, World," we aim higher. Each language in Seven More Languages in Seven Weeks will take you on a step-by-step journey through the most important paradigms of our time. You'll learn seven exciting languages: Lua, Factor, Elixir, Elm, Julia, MiniKanren, and Idris. Learn from the award-winning programming series that inspired the Elixir language. Hear how other programmers across broadly different communities solve problems important enough to compel language development. Expand your perspective, and learn to solve multicore and distribution problems. In each language, you'll solve a non-trivial problem, using the techniques that make that language special. Write a fully functional game in Elm, without a single callback, that compiles to JavaScript so you can deploy it in any browser. Write a logic program in Clojure using a programming model, MiniKanren, that is as powerful as Prolog but much better at interacting with the outside world. Build a distributed program in Elixir with Lisp-style macros, rich Ruby-like syntax, and the richness of the Erlang virtual machine. Build your own object layer in Lua, a statistical program in Julia, a proof in code with Idris, and a quiz game in Factor. When you're done, you'll have written programs in five different programming paradigms that were written on three different continents. You'll have explored four languages on the leading edge, invented in the past five years, and three more radically different languages, each with something significant to teach you.

Explore functional programming without the academic overtones (tell me about monads just one more time). Create concurrent applications,

but get them right without all the locking and consistency headaches. Meet Elixir, a modern, functional, concurrent language built on the rock-solid Erlang VM. Elixir's pragmatic syntax and built-in support for metaprogramming will make you productive and keep you interested for the long haul. Maybe the time is right for the Next Big Thing. Maybe it's Elixir. This book is the introduction to Elixir for experienced programmers, completely updated for Elixir 1.3. Functional programming techniques help you manage the complexities of today's real-world, concurrent systems; maximize uptime; and manage security. Enter Elixir, with its modern, Ruby-like, extendable syntax, compile and runtime evaluation, hygienic macro system, and more. But, just as importantly, Elixir brings a sense of enjoyment to parallel, functional programming. Your applications become fun to work with, and the language encourages you to experiment. Part 1 covers the basics of writing sequential Elixir programs. We'll look at the language, the tools, and the conventions. Part 2 uses these skills to start writing concurrent code-applications that use all the cores on your machine, or all the machines on your network! And we do it both with and without OTP. Part 3 looks at the more advanced features of the language, from DSLs and code generation toextending the syntax. This edition is fully updated with all the new features of Elixir 1.3, with a new chapter on Tooling, covering testing (both conventional and property based), code and dependency exploration, and servermonitoring.By the end of this book, you'll understand Elixir, and know how to apply it to solve your complex, modern problems. What You Need: You'll need a computer, a little experience with another high-level language, and a sense of adventure. No functional programming experience is needed.

JavaScript is no longer to be feared or loathed - the world's most popular and ubiquitous language has evolved into a respectable language. Whether you're writing frontend applications or server side code, the phenomenal features from ES6 and beyond - like the rest operator, generators, destructuring, object literals, arrow functions, modern classes, promises, async, and metaprogramming capabilities - will get you excited and eager to program with JavaScript. You've found the right book to get started quickly and dive deep into the essence of modern JavaScript. Learn practical tips to apply the elegant parts of the language and the gotchas to avoid. JavaScript is a black swan that no one, including the author of the language, thought would become a popular and ubiquitous language. Not long ago, it was the most hated and feared language you could use to program the web. JavaScript ES6 and beyond has gone through a significant makeover. Troublesome features have been replaced with better, elegant, more reliable alternatives. This book includes many practical examples and exercises to help you learn in depth. It will not bore you with idiosyncrasies and arcane details intended for bad interview questions. Instead, it takes you into key features that you can readily use in your day-to-day projects. Whether you program the frontend or the server side, you can now write concise, elegant, and expressive JavaScript with newer features like default parameters, template literals, rest and spread operators, destructuring, arrow functions, and generators. Take it up a notch with features like infinite series, promises, async, and metaprogramming to create flexible, powerful, and extensible libraries. While the evolved features of the language will draw you in, the hundreds of examples in this book will pin the concepts down, for you to use on your projects. Take command of modern JavaScript and unlock your potential to create powerful applications. What You Need: To try out the examples in the book you will need a computer with Node.js, a text editor, and a browser like Chrome installed in it.

When carefully selected and used, Domain-Specific Languages (DSLs) may simplify complex code, promote effective communication with customers, improve productivity, and unclog development bottlenecks. In Domain-Specific Languages , noted software development expert Martin Fowler first provides the information software professionals need to decide if and when to utilize DSLs. Then, where DSLs prove suitable, Fowler presents effective techniques for building them, and guides software engineers in choosing the right approaches for their

applications. This book's techniques may be utilized with most modern object-oriented languages; the author provides numerous examples in Java and C#, as well as selected examples in Ruby. Wherever possible, chapters are organized to be self-standing, and most reference topics are presented in a familiar patterns format. Armed with this wide-ranging book, developers will have the knowledge they need to make important decisions about DSLs—and, where appropriate, gain the significant technical and business benefits they offer. The topics covered include: How DSLs compare to frameworks and libraries, and when those alternatives are sufficient Using parsers and parser generators, and parsing external DSLs Understanding, comparing, and choosing DSL language constructs Determining whether to use code generation, and comparing code generation strategies Previewing new language workbench tools for creating DSLs

Explore the fundamentals of systems programming starting from kernel API and filesystem to network programming and process communications Key Features Learn how to write Unix and Linux system code in Golang v1.12 Perform inter-process communication using pipes, message queues, shared memory, and semaphores Explore modern Go features such as goroutines and channels that facilitate systems programming Book Description System software and applications were largely created using low-level languages such as C or C++. Go is a modern language that combines simplicity, concurrency, and performance, making it a good alternative for building system applications for Linux and macOS. This Go book introduces Unix and systems programming to help you understand the components the OS has to offer, ranging from the kernel API to the filesystem, and familiarize yourself with Go and its specifications. You'll also learn how to optimize input and output operations with files and streams of data, which are useful tools in building pseudo terminal applications. You'll gain insights into how processes communicate with each other, and learn about processes and daemon control using signals, pipes, and exit codes. This book will also enable you to understand how to use network communication using various protocols, including TCP and HTTP. As you advance, you'll focus on Go's best feature-concurrency helping you handle communication with channels and goroutines, other concurrency tools to synchronize shared resources, and the context package to write elegant applications. By the end of this book, you will have learned how to build concurrent system applications using Go What you will learn Explore concepts of system programming using Go and concurrency Gain insights into Golang's internals, memory models and allocation Familiarize yourself with the filesystem and IO streams in general Handle and control processes and daemons' lifetime via signals and pipes Communicate with other applications effectively using a network Use various encoding formats to serialize complex data structures Become well-versed in concurrency with channels, goroutines, and sync Use concurrency patterns to build robust and performant system applications Who this book is for If you are a developer who wants to learn system programming with Go, this book is for you. Although no knowledge of Unix and Linux system programming is necessary, intermediate knowledge of Go will help you understand the concepts covered in the book

A complete description of Erlang, a programming language for building robust concurrent systems. The book contains many examples of how robust real-time systems can be programmed using this language.

Summary Phoenix is a modern web framework built for the Elixir programming language. Elegant, fault-tolerant, and performant, Phoenix is as easy to use as Rails and as rock-solid as Elixir's Erlang-based foundation. Phoenix in Action builds on your existing web dev skills, teaching you the unique benefits of Phoenix along with just enough Elixir to get the job done. Foreword by Sasa Juric, author of Elixir in Action, Second Edition. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Modern web applications need to be efficient to develop, lightning fast, and unfailingly reliable. Phoenix, a web framework for the Elixir programming language, delivers on all counts. Elegant and intuitive, Phoenix radically simplifies the dev process. Built for

concurrency, Phoenix channels make short work of developing real-time applications. And as for reliability, Phoenix apps run on the battle-tested Erlang VM, so they're rock solid! About the Book Phoenix in Action is an example-based book that teaches you to build production-quality web apps. You'll handle business logic, database interactions, and app designs as you progressively create an online auction site. As you go, you'll build everything from the core components to the real-time user interactions where Phoenix really shines. What's inside Functional programming in a web environment An introduction to Elixir Database interactions with Ecto Real-time communication with channels About the Reader For web developers familiar with a framework like Rails or ASP.NET. No experience with Elixir or Phoenix required. About the Author Geoffrey Lessel is a seasoned web developer who speaks and blogs about Elixir and Phoenix. Table of Contents PART 1 - GETTING STARTED Ride the Phoenix Intro to Elixir A little Phoenix overview PART 2 - DIVING IN DEEP Phoenix is not your application Elixir application structure Bring in Phoenix Making changes with Ecto.Changeset Transforming data in your browser Plugs, assigns, and dealing with session data Associating records and accepting bids PART 3 - THOSE IMPORTANT EXTRAS Using Phoenix channels for real-time communication Building an API Testing in Elixir and Phoenix

Adoption is more than programming. Elixir is an exciting new language, but to successfully get your application from start to finish, you're going to need to know more than just the language. The case studies and strategies in this book will get you there. Learn the best practices for the whole life of your application, from design and team-building, to managing stakeholders, to deployment and monitoring. Go beyond the syntax and the tools to learn the techniques you need to develop your Elixir application from concept to production. Learn real-life strategies from the people who built Elixir and use it successfully at scale. See how Ben Marx and Bleacher Report maintain one of the highest-traffic Elixir applications by selling the concept to management and delivering on that promise. Find out how Bruce Tate and icanmakeitbetter hire and train Elixir engineers, and the techniques they've employed to design and ensure code consistency since Elixir's early days. Explore customer challenges in deploying and monitoring distributed applications with Elixir creator Jose Valim and Plataformatec. Make a business case and build a team before you finish your first prototype. Once you're in development, form strategies for organizing your code and learning the constraints of the runtime and ecosystem. Convince stakeholders, both business and technical, about the value they can expect. Prepare to make the critical early decisions that will shape your application for years to come. Manage your deployment with all of the knobs and gauges that good DevOps teams demand. Decide between the many options available for deployment, and how to best prepare yourself for the challenges of running a production application. This book picks up where most Elixir books leave off. It won't teach you to program Elixir, or any of its tools. Instead, it guides you through the broader landscape and shows you a holistic approach to adopting the language. What You Need: This book works with any version of Elixir.

What others in the trenches say about The Pragmatic Programmer... “The cool thing about this book is that it’s great for keeping the programming process fresh. The book helps you to continue to grow and clearly comes from people who have been there.” —Kent Beck, author of Extreme Programming Explained: Embrace Change “I found this book to be a great mix of solid advice and wonderful analogies!” —Martin Fowler, author of Refactoring and UML Distilled “I would buy a copy, read it twice, then tell all my colleagues to run out and grab a copy. This is a book I would never loan because I would worry about it being lost.” —Kevin Ruland, Management Science, MSG-Logistics “The wisdom and practical experience of the authors is obvious. The topics presented are relevant and useful.... By far its greatest strength for me has been the outstanding analogies—tracer bullets, broken windows, and the fabulous helicopter-based explanation of the need for orthogonality, especially in a crisis situation. I have little doubt that this book will eventually become an excellent source of useful information

for journeymen programmers and expert mentors alike." —John Lakos, author of Large-Scale C++ Software Design "This is the sort of book I will buy a dozen copies of when it comes out so I can give it to my clients." —Eric Vought, Software Engineer "Most modern books on software development fail to cover the basics of what makes a great software developer, instead spending their time on syntax or technology where in reality the greatest leverage possible for any software team is in having talented developers who really know their craft well. An excellent book." —Pete McBreen, Independent Consultant "Since reading this book, I have implemented many of the practical suggestions and tips it contains. Across the board, they have saved my company time and money while helping me get my job done quicker! This should be a desktop reference for everyone who works with code for a living." —Jared Richardson, Senior Software Developer, iRenaissance, Inc. "I would like to see this issued to every new employee at my company...." —Chris Cleeland, Senior Software Engineer, Object Computing, Inc. "If I'm putting together a project, it's the authors of this book that I want. . . . And failing that I'd settle for people who've read their book." —Ward Cunningham Straight from the programming trenches, The Pragmatic Programmer cuts through the increasing specialization and technicalities of modern software development to examine the core process--taking a requirement and producing working, maintainable code that delights its users. It covers topics ranging from personal responsibility and career development to architectural techniques for keeping your code flexible and easy to adapt and reuse. Read this book, and you'll learn how to Fight software rot; Avoid the trap of duplicating knowledge; Write flexible, dynamic, and adaptable code; Avoid programming by coincidence; Bullet-proof your code with contracts, assertions, and exceptions; Capture real requirements; Test ruthlessly and effectively; Delight your users; Build teams of pragmatic programmers; and Make your developments more precise with automation. Written as a series of self-contained sections and filled with entertaining anecdotes, thoughtful examples, and interesting analogies, The Pragmatic Programmer illustrates the best practices and major pitfalls of many different aspects of software development. Whether you're a new coder, an experienced programmer, or a manager responsible for software projects, use these lessons daily, and you'll quickly see improvements in personal productivity, accuracy, and job satisfaction. You'll learn skills and develop habits and attitudes that form the foundation for long-term success in your career. You'll become a Pragmatic Programmer.

"Phoenix is the long-awaited web framework based on Elixir, the highly concurrent language that combines a beautiful syntax with rich metaprogramming. The authors, who developed the earliest production Phoenix applications, will show you how to create code that's easier to write, test, understand, and maintain. The best way to learn Phoenix is to code, and you'll get to attack some interesting problems. Start working with controllers, views, and templates within the first few pages. Build an in-memory repository, and then back it with an Ecto database layer. Learn to use change sets and constraints that keep readers informed and your database integrity intact. Craft your own interactive application based on the channels API for the real-time, high-performance applications that this ecosystem made famous. Write your own authentication components called plugs, and even learn to use the OTP layer for monitored, reliable services. Organize your code with umbrella projects so you can keep your applications modular and easy to maintain"--Amazon.com.

If you're just learning how to program, Julia is an excellent JIT-compiled, dynamically typed language with a clean syntax. This hands-on guide uses Julia 1.0 to walk you through programming one step at a time, beginning with basic programming concepts before moving on to more advanced capabilities, such as creating new types and multiple dispatch. Designed from the beginning

for high performance, Julia is a general-purpose language ideal for not only numerical analysis and computational science but also web programming and scripting. Through exercises in each chapter, you'll try out programming concepts as you learn them. Think Julia is perfect for students at the high school or college level as well as self-learners and professionals who need to learn programming basics. Start with the basics, including language syntax and semantics Get a clear definition of each programming concept Learn about values, variables, statements, functions, and data structures in a logical progression Discover how to work with files and databases Understand types, methods, and multiple dispatch Use debugging techniques to fix syntax, runtime, and semantic errors Explore interface design and data structures through case studies

Provides information on creating Web-based applications using Ruby.

Annotation Everyone in the Ruby world seems to be talking about metaprogramming--how you can use it to remove duplication in your code and write elegant, beautiful programs. Now you can get in on the action as well. This book describes metaprogramming as an essential component of Ruby. Once you understand the principles of Ruby, including the object model, scopes, and eigenclasses, you're on your way to applying metaprogramming both in your daily work and in your fun, after-hours projects. Learning metaprogramming doesn't have to be difficult or boring. By taking you on a Monday-through-Friday workweek adventure with a pair of programmers, Paolo Perrotta helps make mastering the art of metaprogramming both straightforward and entertaining. The book is packed with: Pragmatic examples of metaprogramming in action, many of which come straight from popular libraries or frameworks, such as Rails. Programming challenges that let you experiment and play with some of the most fun, "out-there" metaprogramming concepts. Metaprogramming "spells"--34 practical recipes and idioms that you can study and apply right now, to write code that is sure to impress. Whether you're a Ruby apprentice on the path to mastering the language or a Ruby wiz in search of new tips, this book is for you.

You know how to code in Elixir; now learn to think in it. Learn to design libraries with intelligent layers that shape the right data structures, flow from one function into the next, and present the right APIs. Embrace the same OTP that's kept our telephone systems reliable and fast for over 30 years. Move beyond understanding the OTP functions to knowing what's happening under the hood, and why that matters. Using that knowledge, instinctively know how to design systems that deliver fast and resilient services to your users, all with an Elixir focus. Elixir is gaining mindshare as the programming language you can use to keep you software running forever, even in the face of unexpected errors and an ever growing need to use more processors. This power comes from an effective programming language, an excellent foundation for concurrency and its inheritance of a battle-tested framework called the OTP. If you're using frameworks like Phoenix or Nerves, you're already experiencing the features that make Elixir an excellent language for today's demands. This book shows you how to go beyond simple programming to designing, and that means building the right layers. Embrace those data structures that work best in functional programs and use them to build functions that perform and compose well, layer by layer, across processes. Test your code at the right place using the right techniques. Layer your code into pieces that are easy to understand and heal themselves when errors strike. Of all Elixir's boons,

the most important one is that it guides us to design our programs in a way to most benefit from the architecture that they run on. The experts do it and now you can learn to design programs that do the same. What You Need: Elixir Version 1.7 or greater. Summary Revised and updated for Elixir 1.7, Elixir in Action, Second Edition teaches you how to apply Elixir to practical problems associated with scalability, fault tolerance, and high availability. Along the way, you'll develop an appreciation for, and considerable skill in, a functional and concurrent style of programming. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology When you're building mission-critical software, fault tolerance matters. The Elixir programming language delivers fast, reliable applications, whether you're building a large-scale distributed system, a set of backend services, or a simple web app. And Elixir's elegant syntax and functional programming mindset make your software easy to write, read, and maintain. About the Book Elixir in Action, Second Edition teaches you how to build production-quality distributed applications using the Elixir programming language. Author Saša Juri? introduces this powerful language using examples that highlight the benefits of Elixir's functional and concurrent programming. You'll discover how the OTP framework can radically reduce tedious low-level coding tasks. You'll also explore practical approaches to concurrency as you learn to distribute a production system over multiple machines. What's inside Updated for Elixir 1.7 Functional and concurrent programming Introduction to distributed system design Creating deployable releases About the Reader You'll need intermediate skills with client/server applications and a language like Java, C#, or Ruby. No previous experience with Elixir required. About the Author Saša Juri? is a developer with extensive experience using Elixir and Erlang in complex server-side systems. Table of Contents First steps Building blocks Control flow Data abstractions Concurrency primitives Generic server processes Building a concurrent system Fault-tolerance basics Isolating error effects Beyond GenServer Working with components Building a distributed system Running the system

Provides a guide to using Scala and Clojure to solve in-depth programming problems.

Languages may come and go, but the relational database endures. Learn how to use Ecto, the premier database library for Elixir, to connect your Elixir and Phoenix apps to databases. Get a firm handle on Ecto fundamentals with a module-by-module tour of the critical parts of Ecto. Then move on to more advanced topics and advice on best practices with a series of recipes that provide clear, step-by-step instructions on scenarios commonly encountered by app developers. Co-authored by the creator of Ecto, this title provides all the essentials you need to use Ecto effectively. Elixir and Phoenix are taking the application development world by storm, and Ecto, the database library that ships with Phoenix, is going right along with them. There are plenty of examples that show you the basics, but to use Ecto to its full potential, you need to learn the library from the ground up. This definitive guide starts with a tour of the core features of Ecto - repos, queries, schemas, changesets, transactions - gradually building your knowledge with tasks of ever-increasing complexity. Along the way, you'll be learning by doing - a sample application handles all the boilerplate so you can focus on getting Ecto into your fingers. Build on that core knowledge with a series of recipes featuring more advanced topics. Change your pooling strategy to maximize your database's efficiency. Use nested associations to handle

complex table relationships. Add streams to handle large result sets with ease. Based on questions from Ecto users, these recipes cover the most common situations developers run into. Whether you're new to Ecto, or already have an app in production, this title will give you a deeper understanding of how Ecto works, and help make your database code cleaner and more efficient. What You Need: To follow along with the book, you should have Erlang/OTP 19+ and Elixir 1.4+ installed. The book will guide you through setting up a sample application that integrates Ecto.

If you’re new to Erlang, its functional style can seem difficult, but with help from this hands-on introduction, you’ll scale the learning curve and discover how enjoyable, powerful, and fun this language can be. In this updated second edition, author Simon St.Laurent shows you how to write simple Erlang programs by teaching you one skill at a time. You’ll learn about pattern matching, recursion, message passing, process-oriented programming, and establishing pathways for data rather than telling it where to go. By the end of your journey, you’ll understand why Erlang is ideal for concurrency and resilience. Get cozy with Erlang’s shell, its command line interface Define functions, using the fun tool, to represent repeated calculations Discover atoms, pattern matching, and guards: the foundations of your program structure Delve into the heart of Erlang processing with recursion, strings, lists, and higher-order functions Create processes, send messages among them, and apply pattern matching to incoming messages Store and manipulate structured data with Erlang Term Storage and the Mnesia database Learn about Open Telecom Platform, Erlang’s open source libraries and tools

JavaScript is the native language of the Internet. Originally created to make web pages more dynamic, it is now used for software projects of all kinds, including scientific visualization and data services. However, most data scientists have little or no experience with JavaScript, and most introductions to the language are written for people who want to build shopping carts rather than share maps of coral reefs. This book will introduce you to JavaScript's power and idiosyncrasies and guide you through the key features of the language and its tools and libraries. The book places equal focus on client- and server-side programming, and shows readers how to create interactive web content, build and test data services, and visualize data in the browser. Topics include: The core features of modern JavaScript Creating templated web pages Making those pages interactive using React Data visualization using Vega-Lite Using Data-Forge to wrangle tabular data Building a data service with Express Unit testing with Mocha All of the material is covered by the Creative Commons Attribution-Noncommercial 4.0 International license (CC-BY-NC-4.0) and is included in the book's companion website at http://js4ds.org . Maya Gans is a freelance data scientist and front-end developer by way of quantitative biology. Toby Hodges is a bioinformatician turned community coordinator who works at the European Molecular Biology Laboratory. Greg Wilson co-founded Software Carpentry, and is now part of the education team at

RStudio

Function literals, Monads, Lazy evaluation, Currying, and more About This Book Write concise and maintainable code with streams and high-order functions Understand the benefits of currying your Golang functions Learn the most effective design patterns for functional programming and learn when to apply each of them Build distributed MapReduce solutions using Go Who This Book Is For This book is for Golang developers comfortable with OOP and interested in learning how to apply the functional paradigm to create robust and testable apps. Prior programming experience with Go would be helpful, but not mandatory. What You Will Learn Learn how to compose reliable applications using high-order functions Explore techniques to eliminate side-effects using FP techniques such as currying Use first-class functions to implement pure functions Understand how to implement a lambda expression in Go Compose a working application using the decorator pattern Create faster programs using lazy evaluation Use Go concurrency constructs to compose a functionality pipeline Understand category theory and what it has to do with FP In Detail Functional programming is a popular programming paradigm that is used to simplify many tasks and will help you write flexible and succinct code. It allows you to decompose your programs into smaller, highly reusable components, without applying conceptual restraints on how the software should be modularized. This book bridges the language gap for Golang developers by showing you how to create and consume functional constructs in Golang. The book is divided into four modules. The first module explains the functional style of programming; pure functional programming (FP), manipulating collections, and using high-order functions. In the second module, you will learn design patterns that you can use to build FP-style applications. In the next module, you will learn FP techniques that you can use to improve your API signatures, to increase performance, and to build better Cloud-native applications. The last module delves into the underpinnings of FP with an introduction to category theory for software developers to give you a real understanding of what pure functional programming is all about, along with applicable code examples. By the end of the book, you will be adept at building applications the functional way. Style and approach This book takes a pragmatic approach and shows you techniques to write better functional constructs in Golang. We'll also show you how use these concepts to build robust and testable apps. Intermediate level, for programmers fairly familiar with Java, but new to the functional style of programming and lambda expressions. Get ready to program in a whole new way. Functional Programming in Java will help you quickly get on top of the new, essential Java 8 language features and the functional style that will change and improve your code. This short, targeted book will help you make the paradigm shift from the old imperative way to a less error-prone, more elegant, and concise coding style that's also a breeze to parallelize. You'll explore the syntax and semantics of lambda expressions, method and constructor references, and functional interfaces. You'll design and write applications better

using the new standards in Java 8 and the JDK. Lambda expressions are lightweight, highly concise anonymous methods backed by functional interfaces in Java 8. You can use them to leap forward into a whole new world of programming in Java. With functional programming capabilities, which have been around for decades in other languages, you can now write elegant, concise, less error-prone code using standard Java. This book will guide you though the paradigm change, offer the essential details about the new features, and show you how to transition from your old way of coding to an improved style. In this book you'll see popular design patterns, such as decorator, builder, and strategy, come to life to solve common design problems, but with little ceremony and effort. With these new capabilities in hand, Functional Programming in Java will help you pick up techniques to implement designs that were beyond easy reach in earlier versions of Java. You'll see how you can reap the benefits of tail call optimization, memoization, and effortless parallelization techniques. Java 8 will change the way you write applications. If you're eager to take advantage of the new features in the language, this is the book for you. What you need: Java 8 with support for lambda expressions and the JDK is required to make use of the concepts and the examples in this book.

Elixir offers new paradigms, and challenges you to test in unconventional ways. Start with ExUnit: almost everything you need to write tests covering all levels of detail, from unit to integration, but only if you know how to use it to the fullest - we'll show you how. Explore testing Elixir-specific challenges such as OTP-based modules, asynchronous code, Ecto-based applications, and Phoenix applications. Explore new tools like Mox for mocks and StreamData for property-based testing. Armed with this knowledge, you can create test suites that add value to your production cycle and guard you from regressions. Write Elixir tests that you can be proud of. Dive into Elixir's test philosophy and gain mastery over the terminology and concepts that underlie good tests. Create and structure a comprehensive ExUnit test suite, starting from the basics, and build comprehensive test coverage that will provide safety for refactoring and confidence that your code performs as designed. Use tests to make your software more reliable and fault tolerant. Explore the basic tool set provided by ExUnit and Mix to write and organize your test suite. Test code built around different OTP functionality. Isolate your code through dependency injection and by using Mox. Write comprehensive tests for Ecto projects, covering Ecto as a database tool as well as a standalone data validation tool. Test Phoenix channels from end to end, including authentication and joining topics. Write Phoenix controller tests and understand the concepts of integration testing in Elixir. Learn property-based testing with StreamData from the author who wrote the library. Code with high confidence that you are getting the most out of your test suite, with the right tools that make testing your code a pleasure and a valuable part of your development cycle. What You Need: To get the most out of this book, you will need to have installed Elixir 1.8 or later and Erlang/OTP 21 or later. In order to complete the relevant chapters, you will also need Ecto 3.1 or

later, EctoSQL 3.1 or later and Phoenix 1.3 or later.

The days of the traditional request-response web application are long gone, but you don't have to wade through oceans of JavaScript to build the interactive applications today's users crave. The innovative Phoenix LiveView library empowers you to build applications that are fast and highly interactive, without sacrificing reliability. This definitive guide to LiveView isn't a reference manual. Learn to think in LiveView. Write your code layer by layer, the way the experts do. Explore techniques with experienced teachers to get the best possible performance. Instead of settling for traditional manuals and tutorials, get insights that can only be learned from experience. Start with the Elixir language techniques that effortlessly marry your client templates and server-side handlers. Design your systems with the right layers in the right places so that your code is easier to understand, change, and support. Explore features like multi-part uploads and learn how to comprehensively test your live views. Roll into advanced techniques to tie your code to other services through the powerful publish-subscribe interface. LiveView brings the most important programming techniques from the popular Elm and JavaScript React frameworks to Elixir. You'll experience firsthand how to harness that power by working side by side with some of the first LiveView users. You will write your programs to change data on the server, and you'll see how LiveView efficiently detects those changes and reflects them on the web page. Start from scratch, use built-in generators, and craft reusable components. Your single-purpose reducers will transform server data that your renderers can turn into efficient client-side diffs. Don't settle for knowing how things work. To get the most out of LiveView, you need to know why they work that way. Co-authored by one of the most prolific authors and teachers in all of Elixir, this book is your perfect guide to one of the most important new frameworks of our generation. What You Need: Programming Phoenix LiveView uses Phoenix version 1.5, and any Elixir version compatible with it. You will also want PostgreSQL and JavaScript Node.

Unveil many hidden gems of programming functionally by taking the foundational steps with Elixir About This Book Explore the functional paradigms of programming with Elixir through use of helpful examples Concise step-by-step instructions to teach you difficult technical concepts Bridge the gap between functional programming and Elixir Who This Book Is For This book targets developers new to Elixir, as well as Erlang, in order to make them feel comfortable in functional programming with Elixir, thus enabling them to develop more scalable and fault-tolerant applications. Although no knowledge of Elixir is assumed, some programming experience with mainstream Object-Oriented programming languages such a Ruby, Python, Java, C# would be beneficial. What You Will Learn Explore Elixir to create resilient, scalable applications Create fault-tolerant applications Become better acquainted with Elixir code and see how it is structured to build and develop functional programs Learn the basics of functional programming Gain an understanding

of effective OTP principles Design program-distributed applications and systems Write and create branching statements in Elixir Learn to do more with less using Elixir's metaprogramming Be familiar with the facilities Elixir provides for metaprogramming, macros, and extending the Elixir language In Detail Elixir, based on Erlang's virtual machine and ecosystem, makes it easier to achieve scalability, concurrency, fault tolerance, and high availability goals that are pursued by developers using any programming language or programming paradigm. Elixir is a modern programming language that utilizes the benefits offered by Erlang VM without really incorporating the complex syntaxes of Erlang. Learning to program using Elixir will teach many things that are very beneficial to programming as a craft, even if at the end of the day, the programmer isn't using Elixir. This book will teach you concepts and principles important to any complex, scalable, and resilient application. Mostly, applications are historically difficult to reason about, but using the concepts in this book, they will become easy and enjoyable. It will teach you the functional programing ropes, to enable them to create better and more scalable applications, and you will explore how Elixir can help you achieve new programming heights. You will also glean a firm understanding of basics of OTP and the available generic, provided functionality for creating resilient complex systems. Furthermore, you will learn the basics of metaprogramming: modifying and extending Elixir to suite your needs. Style and approach An exploration of functional programming and Elixir with easy to follow examples using Elixir and the functional style. All the topics, concepts, and principles covered are clearly and concisely explained with either code examples or in depth discussions, or both!

This book is the introduction to Elixir for experienced programmers, completely updated for Elixir 1.6 and beyond. Explore functional programming without the academic overtones (tell me about monads just one more time). Create concurrent applications, butget them right without all the locking and consistency headaches. Meet Elixir, a modern, functional, concurrent language built on the rock-solid Erlang VM. Elixir's pragmatic syntax and built-in support for metaprogramming will make you productive and keep you interestedfor the long haul. Maybe the time is right for the Next Big Thing. Maybe it's Elixir. Functional programming techniques help you manage the complexities of today's real-world, concurrent systems; maximize uptime; and manage security. Enter Elixir, with its modern, Ruby-like, extendable syntax, compile and runtime evaluation, hygienic macro system, and more. But, just as importantly, Elixir brings a sense of enjoyment to parallel,functional programming. Your applications become fun to work with, and the language encourages you to experiment. Part 1 covers the basics of writing sequential Elixir programs. We'll look at the language, the tools, and the conventions. Part 2 uses these skills to start writing concurrent code-applications that use all the cores on your machine, or all the machines on your network! And we do it both with and without OTP. Part 3 looks at the more advanced features of the language, from DSLs and code generation to extending the syntax. This edition is fully updated with all the new

features of Elixir 1.6, with a new chapter on structuring OTP applications, and new sections on the debugger, code formatter, Distillery, and protocols. What You Need: You'll need a computer, a little experience with another high-levellanguage, and a sense of adventure. No functional programmingexperience is needed.

Your domain is rich and interconnected, and your API should be too. Upgrade your web API to GraphQL, leveraging its flexible queries to empower your users, and its declarative structure to simplify your code. Absinthe is the GraphQL toolkit for Elixir, a functional programming language designed to enable massive concurrency atop robust application architectures. Written by the creators of Absinthe, this book will help you take full advantage of these two groundbreaking technologies. Build your own flexible, high-performance APIs using step-by-step guidance and expert advice you won't find anywhere else. GraphQL is a new way of structuring and building web services, and the result is transformational. Find out how to offer a more tailored, cohesive experience to your users, easily aggregate data from different data sources, and improve your back end's maintainability with Absinthe's declarative approach to defining how your API works. Build a GraphQL-based API from scratch using Absinthe, starting from core principles. Learn the type system and how to expand your schema to suit your application's needs. Discover a growing ecosystem of tools and utilities to understand, debug, and document your API. Take it to production, but do it safely with solid best practices in mind. Find out how complexity analysis and persisted queries can let you support your users flexibly, but responsibly too. Along the way, discover how Elixir makes all the difference for a high performance, fault-tolerant API. Use asynchronous and batching execution, or write your own custom add-ons to extend Absinthe. Go live with subscriptions, delivering data over websockets on top of Elixir (and Erlang/OTP's) famous solid performance and real-time capabilities. Transform your applications with the powerful combination of Elixir and GraphQL, using Absinthe. What You Need: To follow along with the book, you should have Erlang/OTP 19+ and Elixir 1.4+ installed. The book will guide you through setting up a new Phoenix application using Absinthe.

Understanding the Machine, the first volume in the landmark Write Great Code series by Randall Hyde, explains the underlying mechanics of how a computer works. This, the first volume in Randall Hyde's Write Great Code series, dives into machine organization without the extra overhead of learning assembly language programming. Written for high-level language programmers, Understanding the Machine fills in the low-level details of machine organization that are often left out of computer science and engineering courses. Learn: • How the machine represents numbers, strings, and high-level data structures, so you'll know the inherent cost of using them. • How to organize your data, so the machine can access it efficiently. • How the CPU operates, so you can write code that works the way the machine does. • How I/O devices operate, so you can maximize your application's performance when accessing those devices. • How to best use the

memory hierarchy to produce the fastest possible programs. Great code is efficient code. But before you can write truly efficient code, you must understand how computer systems execute programs and how abstractions in programming languages map to the machine's low-level hardware. After all, compilers don't write the best machine code; programmers do. This book gives you the foundation upon which all great software is built. NEW IN THIS EDITION, COVERAGE OF: • Programming languages like Swift and Java • Code generation on modern 64-bit CPUs • ARM processors on mobile phones and tablets • Newer peripheral devices • Larger memory systems and large-scale SSDs

Erlang is the language of choice for programmers who want to write robust, concurrent applications, but its strange syntax and functional design can intimidate the uninitiated. Luckily, there’s a new weapon in the battle against Erlang-phobia: Learn You Some Erlang for Great Good! Erlang maestro Fred Hébert starts slow and eases you into the basics: You’ll learn about Erlang’s unorthodox syntax, its data structures, its type system (or lack thereof!), and basic functional programming techniques. Once you’ve wrapped your head around the simple stuff, you’ll tackle the real meat-and-potatoes of the language: concurrency, distributed computing, hot code loading, and all the other dark magic that makes Erlang such a hot topic among today’s savvy developers. As you dive into Erlang’s functional fantasy world, you’ll learn about: –Testing your applications with EUnit and Common Test –Building and releasing your applications with the OTP framework –Passing messages, raising errors, and starting/stopping processes over many nodes –Storing and retrieving data using Mnesia and ETS –Network programming with TCP, UDP, and the inet module –The simple joys and potential pitfalls of writing distributed, concurrent applications Packed with lighthearted illustrations and just the right mix of offbeat and practical example programs, Learn You Some Erlang for Great Good! is the perfect entry point into the sometimes-crazy, always-thrilling world of Erlang.

A multi-user game, web site, cloud application, or networked database can have thousands of users all interacting at the same time. You need a powerful, industrial-strength tool to handle the really hard problems inherent in parallel, concurrent environments. You need Erlang. In this second edition of the bestselling Programming Erlang, you'll learn how to write parallel programs that scale effortlessly on multicore systems. Using Erlang, you'll be surprised at how easy it becomes to deal with parallel problems, and how much faster and more efficiently your programs run. That's because Erlang uses sets of parallel processes-not a single sequential process, as found in most programming languages. Joe Armstrong, creator of Erlang, introduces this powerful language in small steps, giving you a complete overview of Erlang and how to use it in common scenarios. You'll start with sequential programming, move to parallel programming and handling errors in parallel programs, and learn to work confidently with distributed programming and the standard Erlang/Open Telecom Platform (OTP) frameworks. You need no previous knowledge of functional or parallel

programming. The chapters are packed with hands-on, real-world tutorial examples and insider tips and advice, and finish with exercises for both beginning and advanced users. The second edition has been extensively rewritten. New to this edition are seven chapters covering the latest Erlang features: maps, the type system and the Dialyzer, WebSockets, programming idioms, and a new stand-alone execution environment. You'll write programs that dynamically detect and correct errors, and that can be upgraded without stopping the system. There's also coverage of rebar (the de facto Erlang build system), and information on how to share and use Erlang projects on github, illustrated with examples from cowboy and bitcask. Erlang will change your view of the world, and of how you program. What You Need The Erlang/OTP system. Download it from erlang.org.

Elixir's straightforward syntax and this guided tour give you a clean, simple path to learn modern functional programming techniques. No previous functional programming experience required! This book walks you through the right concepts at the right pace, as you explore immutable values and explicit data transformation, functions, modules, recursive functions, pattern matching, high-order functions, polymorphism, and failure handling, all while avoiding side effects. Don't board the Elixir train with an imperative mindset! To get the most out of functional languages, you need to think functionally. This book will get you there. Functional programming offers useful techniques for building maintainable and scalable software that solves today's difficult problems. The demand for software written in this way is increasing - you don't want to miss out. In this book, you'll not only learn Elixir and its features, you'll also learn the mindset required to program functionally. Elixir's clean syntax is excellent for exploring the critical skills of using functions and concurrency. Start with the basic techniques of the functional way: working with immutable data, transforming data in discrete steps, and avoiding side effects. Next, take a deep look at values, expressions, functions, and modules. Then extend your programming with pattern matching and flow control with case, if, cond, and functions. Use recursive functions to create iterations. Work with data types such as lists, tuples, and maps. Improve code reusability and readability with Elixir's most common high-order functions. Explore how to use lazy computation with streams, design your data, and take advantage of polymorphism with protocols. Combine functions and handle failures in a maintainable way using Elixir features and libraries. Learn techniques that matter to make code that lives harmoniously with the language. What You Need: You'll need a computer and Elixir 1.4 or newer version installed. No previous functional programming or Elixir experience is required. Some experience with any programming language is recommended.

Write code that writes code with Elixir macros. Macros make metaprogramming possible and define the language itself. In this book, you'll learn how to use macros to extend the language with fast, maintainable code and share functionality in ways you never thought possible. You'll discover how to extend Elixir with your own first-class features, optimize

performance, and create domain-specific languages. Metaprogramming is one of Elixir's greatest features. Maybe you've played with the basics or written a few macros. Now you want to take it to the next level. This book is a guided series of metaprogramming tutorials that take you step by step to metaprogramming mastery. You'll extend Elixir with powerful features and write faster, more maintainable programs in ways unmatched by other languages. You'll start with the basics of Elixir's metaprogramming system and find out how macros interact with Elixir's abstract format. Then you'll extend Elixir with your own first-class features, write a testing framework, and discover how Elixir treats source code as building blocks, rather than rote lines of instructions. You'll continue your journey by using advanced code generation to create essential libraries in strikingly few lines of code. Finally, you'll create domain-specific languages and learn when and where to apply your skills effectively. When you're done, you will have mastered metaprogramming, gained insights into Elixir's internals, and have the confidence to leverage macros to their full potential in your own projects.
Summary The Little Elixir & OTP Guidebook gets you started programming applications with Elixir and OTP. You begin with a quick overview of the Elixir language syntax, along with just enough functional programming to use it effectively. Then, you'll dive straight into OTP and learn how it helps you build scalable, fault-tolerant and distributed applications through several fun examples. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Elixir is an elegant programming language that combines the expressiveness of Ruby with the concurrency and fault-tolerance of Erlang. It makes full use of Erlang's BEAM VM and OTP library, so you get two decades' worth of maturity and reliability right out of the gate. Elixir's support for functional programming makes it perfect for modern event-driven applications. About the Book The Little Elixir & OTP Guidebook gets you started writing applications with Elixir and OTP. You'll begin with the immediately comfortable Elixir language syntax, along with just enough functional programming to use it effectively. Then, you'll dive straight into several lighthearted examples that teach you to take advantage of the incredible functionality built into the OTP library. What's Inside Covers Elixir 1.2 and 1.3 Introduction to functional concurrency with actors Experience the awesome power of Erlang and OTP About the Reader Written for readers comfortable with a standard programming language like Ruby, Java, or Python. FP experience is helpful but not required. About the Author Benjamin Tan Wei Hao is a software engineer at Pivotal Labs, Singapore. He is also an author, a speaker, and an early adopter of Elixir. Table of Contents GETTING STARTED WITH ELIXIR AND OTP Introduction A whirlwind tour Processes 101 Writing server applications with GenServer FAULT TOLERANCE, SUPERVISION, AND DISTRIBUTION Concurrent error-handling and fault tolerance with links, monitors, and processes Fault tolerance with Supervisors Completing the worker-pool application Distribution and load balancing Distribution and fault tolerance Dialyzer and type specifications Property-based and

concurrency testing

Leverage the power of Elixir programming language to solve practical problems associated with scalability, concurrency, fault tolerance, and high availability. Key Features Enhance your Elixir programming skills using its powerful tools and abstractions Discover how to develop a full-fledged file server Understand how to use Phoenix to create a web interface for your application. Book Description Running concurrent, fault-tolerant applications that scale is a very demanding responsibility. After learning the abstractions that Elixir gives us, developers are able to build such applications with inconceivable low effort. There is a big gap between playing around with Elixir and running it in production, serving live requests. This book will help you fll this gap by going into detail on several aspects of how Elixir works and showing concrete examples of how to apply the concepts learned to a fully fledged application. In this book, you will learn how to build a rock-solid application, beginning by using Mix to create a new project. Then you will learn how the use of Erlang's OTP, along with the Elixir abstractions that run on top of it (such as GenServer and GenStage), that allow you to build applications that are easy to parallelize and distribute. You will also master supervisors (and supervision trees), and comprehend how they are the basis for building fault-tolerant applications. Then you will use Phoenix to create a web interface for your application. Upon fnishing implementation, you will learn how to take your application to the cloud, using Kubernetes to automatically deploy, scale, and manage it. Last, but not least, you will keep your peace of mind by learning how to thoroughly test and then monitor your application. What you will learn Use Elixir tools, including IEx and Mix Find out how an Elixir project is structured and how to create umbrella applications Discover the power of supervision trees, the basis for fault-tolerance Create a Domain-Specifc Language (DSL) that abstracts complexity Create a blazing-fast web interface for your application with Phoenix Set up an automatic deployment process for the cloud Monitor your application and be warned if anything unexpected happens Who this book is for Mastering Elixir is for you if you have experience in Elixir programming and want to take it to the next level. This Elixir book shows you how to build, deploy, and maintain robust applications, allowing you to go from tinkering with Elixir on side projects to using it in a live environment. However, no prior knowledge of Elixir is required to enjoy the complex topics covered in the book.