

# Metaprogramming Elixir Write Less Code Get More Done And Have Fun

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**The Pragmatic Programmer** - Andrew Hunt 1999-10-20

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 in Action* - Geoffrey Lessel  
2019-04-26

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 Testing Elixir - Andrea Leopardi 2021-02-28

**Programming Ecto** - Darin Wilson 2019-04-01 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. **Learning Functional Programming in Go** - Lex Sheehan 2017-11-24 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.

**Effective Modern C++** - Scott Meyers  
2014-11-11

Coming to grips with C++11 and C++14 is more than a matter of familiarizing yourself with the features they introduce (e.g., auto type declarations, move semantics, lambda expressions, and concurrency support). The challenge is learning to use those features effectively—so that your software is correct, efficient, maintainable, and portable. That's where this practical book comes in. It describes how to write truly great software using C++11 and C++14—i.e. using modern C++. Topics include: The pros and cons of braced initialization, noexcept specifications, perfect forwarding, and smart pointer make functions The relationships among `std::move`, `std::forward`, rvalue references, and universal references Techniques for writing clear, correct, effective lambda expressions How `std::atomic` differs from `volatile`, how each should be used, and how they relate to C++'s concurrency API How best practices in "old" C++ programming (i.e., C++98) require revision for software development in modern C++ **Effective Modern C++** follows the proven guideline-based, example-driven format of Scott Meyers' earlier books, but covers entirely new material. "After I learned the C++ basics, I then learned how to use C++ in production code from Meyer's series of **Effective C++** books. **Effective Modern C++** is the most important how-to book for advice on key guidelines, styles, and idioms to use modern C++ effectively and well.

Don't own it yet? Buy this one. Now".  
-- Herb Sutter, Chair of ISO C++  
Standards Committee and C++ Software  
Architect at Microsoft

**Mastering Elixir** - André Albuquerque  
2018-07-30

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 fill 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 finishing 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-Specific 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.

**C Programming Language** - Brian W. Kernighan 1988-03-22

This ebook is the first authorized digital version of Kernighan and Ritchie's 1988 classic, The C Programming Language (2nd Ed.). One of the best-selling programming books published in the last fifty years, "K&R" has been called everything from the "bible" to "a landmark in computer science" and it has influenced generations of programmers. Available now for all leading ebook platforms, this concise and beautifully written text is a "must-have" reference for every serious programmer's digital library. As modestly described by the authors in the Preface to the First Edition,

this "is not an introductory programming manual; it assumes some familiarity with basic programming concepts like variables, assignment statements, loops, and functions. Nonetheless, a novice programmer should be able to read along and pick up the language, although access to a more knowledgeable colleague will help."

**Seven More Languages in Seven Weeks** - Bruce Tate 2014-11-19

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.

Programming Phoenix = 1.4 - Chris McCord 2018-12-05

Don't accept the compromise between fast and beautiful: you can have it all. Phoenix creator Chris McCord, Elixir creator Jose Valim, and award-winning author Bruce Tate walk you through building an application that's fast and reliable. At every step, you'll learn from the Phoenix creators not just what to do, but why. Packed with insider insights and completely updated for Phoenix 1.3, this definitive guide will be your constant companion in your journey from Phoenix novice to expert, as you build the next generation of web applications. Phoenix is the long-awaited web framework based on Elixir, the highly concurrent language that combines a beautiful syntax with rich metaprogramming. 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 context, and then back it with an Ecto database layer, complete with changesets 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 applications that this ecosystem made famous. Write

your own authentication plugs, and use the OTP layer for supervised services. Organize code with modular umbrella projects. This edition is fully updated for Phoenix 1.3, Elixir 1.3, and Ecto 2.1, with a new chapter on using Channel Presence to find out who's connected, even on a distributed application. Use the new generators and the new ExUnit features to organize tests and make Ecto tests concurrent. This is a book by developers and for developers, and we know how to help you ramp up quickly. Any book can tell you what to do. When you've finished this one, you'll also know why to do it. What You Need: To work through this book, you will need a computer capable of running Erlang 18 or higher, Elixir 1.3 or higher, Phoenix 1.3 or higher, and Ecto 2.1 or higher. A rudimentary knowledge of Elixir is also highly recommended.

Developing Web Apps with Haskell and Yesod - Michael Snoyman 2015-02-17  
"This fast-moving guide introduces web application development with Haskell and Yesod, a potent language/framework combination that supports high-performing applications that are modular, type-safe, and concise. You'll work with several samples to explore the way Yesod handles widgets, forms, persistence, and RESTful content. You also get an introduction to various Haskell tools to supplement your basic knowledge of the language. By the time you finish this book, you'll create a production-quality web application with Yesod's ready-to-use scaffolding. You'll also examine several real-world examples, including a blog, a wiki, a JSON web service, and a Sphinx search server"-  
-Publisher's description.

Learn You Some Erlang for Great Good!  
- Fred Hebert 2013-01-13  
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. Programming Language Explorations - Ray Toal 2017-08-09  
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.

Client-Server Web Apps with

JavaScript and Java - Casimir Saternos 2014-03-28

As a Java programmer, how can you tackle the disruptive client-server approach to web development? With this comprehensive guide, you'll learn how today's client-side technologies and web APIs work with various Java tools. Author Casimir Saternos provides the big picture of client-server development, and then takes you through many practical client-server architectures. You'll work with hands-on projects in several chapters to get a feel for the topics discussed. User habits, technologies, and development methods have drastically altered web app design in recent years. But the Web itself hasn't changed. This book shows you how to build apps that conform to the web's underlying architecture. Learn the advantages of using separate client and server tiers, including code organization and speedy prototyping Explore the major tools, frameworks, and starter projects used in JavaScript development Dive into web API design and REST style of software architecture Understand Java's alternatives to traditional packaging methods and application server deployment Build projects with lightweight servers, using jQuery with Jython, and Sinatra with Angular Create client-server web apps with traditional Java web application servers and libraries

**Why's (Poignant) Guide to Ruby** - Why The Lucky Stiff 2020-06

Pythonic Programming - Dmitry Zinoviev 2021-09-23

Make your good Python code even better by following proven and effective pythonic programming tips. Avoid logical errors that usually go undetected by Python linters and code formatters, such as frequent data look-ups in long lists, improper use



of local and global variables, and mishandled user input. Discover rare language features, like rational numbers, set comprehensions, counters, and pickling, that may boost your productivity. Discover how to apply general programming patterns, including caching, in your Python code. Become a better-than-average Python programmer, and develop self-documented, maintainable, easy-to-understand programs that are fast to run and hard to break. Python is one of the most popular and rapidly growing modern programming languages. With more than 200 standard libraries and even more third-party libraries, it reaches into the software development areas as diverse as artificial intelligence, bioinformatics, natural language processing, and computer vision. Find out how to improve your understanding of the spirit of the language by using one hundred pythonic tips to make your code safer, faster, and better documented. This programming style manual is a quick reference of helpful hints and a random source of inspiration. Choose the suitable data structures for searching and sorting jobs and become aware of how a wrong choice may cause your application to be completely ineffective. Understand global and local variables, class and instance attributes, and information-hiding techniques. Create functions with flexible interfaces. Manage intermediate computation results by caching them in files and memory to improve performance and reliability. Polish your documentation skills to make your code easy for other programmers to understand. As a bonus, discover Easter eggs cleverly planted in the standard library by its developers. Polish, secure, and speed-up your Python applications, and make them easier to maintain by following pythonic programming tips.

What You Need: You will need a Python interpreter (ideally, version 3.4 or above) and the standard Python library that usually comes with the interpreter.

**IronPython in Action** - Michael J. Foord 2009

A comprehensive, hands-on introduction to Microsoft's version of Python for the .NET framework. The book shows how to use IronPython with C#, VB.NET, and ASP.NET applications. Readers will use IronPython as a Windows scripting tool, and see how it connects to PowerShell.

Concurrent Programming in ERLANG - Joe Armstrong 1993

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.

Functional Programming: a PragPub Anthology - Michael Swaine 2017-07-30

Explore functional programming and discover new ways of thinking about code. You know you need to master functional programming, but learning one functional language is only the start. In this book, through articles drawn from PragPub magazine and articles written specifically for this book, you'll explore functional thinking and functional style and idioms across languages. Led by expert guides, you'll discover the distinct strengths and approaches of Clojure, Elixir, Haskell, Scala, and Swift and learn which best suits your needs. Contributing authors: Rich Hickey, Stuart Halloway, Aaron Bedra, Michael Bevilacqua-Linn, Venkat Subramaniam, Paul Callaghan, Jose Valim, Dave Thomas, Natasha Murashev, Tony Hillerson, Josh Chisholm, and Bruce Tate. Functional programming is on the rise because it lets you write simpler, cleaner code, and its emphasis on immutability makes it ideal for maximizing the benefits of

multiple cores and distributed solutions. So far nobody's invented the perfect functional language - each has its unique strengths. In *Functional Programming: A PragPub Anthology*, you'll investigate the philosophies, tools, and idioms of five different functional programming languages. See how Swift, the development language for iOS, encourages you to build highly scalable apps using functional techniques like map and reduce. Discover how Scala allows you to transition gently but deeply into functional programming without losing the benefits of the JVM, while with Lisp-based Clojure, you can plunge fully into the functional style. Learn about advanced functional concepts in Haskell, a pure functional language making powerful use of the type system with type inference and type classes. And see how functional programming is becoming more elegant and friendly with Elixir, a new functional language built on the powerful Erlang base. The industry has been embracing functional programming more and more, driven by the need for concurrency and parallelism. This collection of articles will lead you to mastering the functional approach to problem solving. So put on your explorer's hat and prepare to be surprised. The goal of exploration is always discovery. What You Need: Familiarity with one or more programming languages.

*Programming Erlang* - Joe Armstrong  
2013-09-23

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](http://erlang.org). [Adopting Elixir](#) - Ben Marx 2018-03-14

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.

**Real-Time Phoenix** - Stephen Bussey  
2020-03-25

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.

The Little Elixir & OTP Guidebook - Benjamin Tan Wei Hao 2016-09-25

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

*Designing Elixir Systems with Otp: Write Highly Scalable, Self-Healing Software with Layers* - James Edward Gray 2019-11-04

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 your 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.

### **Functional Programming in Java -**

Venkat Subramaniam 2014-02-19

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 through 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.

**Programming Elixir 1.3** - David Thomas 2016

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 to extending 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 server monitoring. 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.

*Genetic Algorithms in Elixir* - Sean Moriarity 2021-02-09

From finance to artificial intelligence, genetic algorithms are a powerful tool with a wide array of applications. But you don't need an exotic new language or framework to get started; you can learn about genetic algorithms in a language you're already familiar with. Join us for an in-depth look at the algorithms, techniques, and methods that go into writing a genetic algorithm. From introductory problems to real-world applications, you'll learn the underlying principles of problem solving using genetic algorithms. Evolutionary algorithms are a unique and often overlooked subset of machine learning and artificial intelligence. Because of this, most of the available resources are outdated or too academic in nature, and none of them are made with Elixir programmers in mind. Start from the ground up with genetic algorithms in a language you are familiar with. Discover the power of genetic algorithms through simple solutions to challenging problems. Use Elixir features to write genetic algorithms that are concise and idiomatic. Learn the complete life cycle of solving a problem using genetic algorithms. Understand the different techniques and fine-tuning required to solve a wide array of problems. Plan, test, analyze, and visualize your genetic algorithms with real-world applications. Open your eyes to a unique and powerful field - without having to learn a new language or framework. What You Need: You'll need a macOS, Windows, or Linux distribution with an up-to-date Elixir installation.

## Property-Based Testing with PropEr, Erlang, and Elixir - Fred Hebert

2019-01-17

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 ElixirFor Erlang tests: Erlang/OTP >= 20.0, with Rebar >= 3.4.0For Elixir tests: Erlang/OTP >= 20.0, Elixir >= 1.5.0

Metaprogramming Elixir - Chris McCord  
2015-01-29

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.

Exercises for Programmers - Brian P. Hogan 2015-09-04

When you write software, you need to be at the top of your game. Great programmers practice to keep their skills sharp. Get sharp and stay sharp with more than fifty practice exercises rooted in real-world scenarios. If you're a new programmer, these challenges will help you learn what you need to break into the field, and if you're a seasoned pro, you can use these exercises to learn that hot new language for your next gig. One of the best ways to learn a programming language is to use it to solve problems. That's what this book is all about. Instead of questions rooted in theory, this book presents problems you'll encounter in everyday software development. These problems are designed for people learning their first programming language, and they also provide a learning path for experienced developers to learn a new language quickly. Start with simple input and output programs. Do some currency conversion and figure out how many months it takes to pay off a credit card. Calculate blood alcohol content and determine if it's safe to drive. Replace words in files and filter records, and use web services to display the weather, store data, and show how many people are in space right now. At the end you'll tackle a few larger programs that will help you bring everything together. Each problem includes constraints and challenges to push you further, but it's up to you to come up with the solutions. And next year, when you want to learn a new programming

language or style of programming (perhaps OOP vs. functional), you can work through this book again, using new approaches to solve familiar problems. What You Need: You need access to a computer, a programming language reference, and the programming language you want to use.

**Domain-Specific Languages** - Martin Fowler 2010-09-23

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

**Introducing Erlang** - Simon St. Laurent 2017-03-06

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

**Learn Functional Programming with Elixir** - Ulisses Almeida 2018-03-05

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.

## **Learning Functional Data Structures and Algorithms** - Atul S. Khot

2017-02-23

Learn functional data structures and algorithms for your applications and bring their benefits to your work now About This Book Moving from object-oriented programming to functional programming? This book will help you get started with functional programming. Easy-to-understand explanations of practical topics will help you get started with functional data structures. Illustrative diagrams to explain the algorithms in detail. Get hands-on practice of Scala to get the most out of functional programming. Who This Book Is For This book is for those who have some experience in functional programming languages. The data structures in this book are primarily written in Scala, however implementing the algorithms in other functional languages should be straight forward. What You Will Learn Learn to think in the functional paradigm Understand common data structures and the associated algorithms, as well as the context in which they are commonly used Take a look at the runtime and space complexities with the  $O$  notation See how ADTs are implemented in a functional setting Explore the basic theme of immutability and persistent data structures Find out how the internal algorithms are redesigned to exploit structural sharing, so that the persistent data structures perform well, avoiding needless copying. Get to know functional features like lazy evaluation and recursion used to implement efficient algorithms Gain Scala best practices and idioms In Detail Functional data structures have the power to improve the codebase of an application and improve efficiency. With the advent

of functional programming and with powerful functional languages such as Scala, Clojure and Elixir becoming part of important enterprise applications, functional data structures have gained an important place in the developer toolkit. Immutability is a cornerstone of functional programming. Immutable and persistent data structures are thread safe by definition and hence very appealing for writing robust concurrent programs. How do we express traditional algorithms in functional setting? Won't we end up copying too much? Do we trade performance for versioned data structures? This book attempts to answer these questions by looking at functional implementations of traditional algorithms. It begins with a refresher and consolidation of what functional programming is all about. Next, you'll get to know about Lists, the work horse data type for most functional languages. We show what structural sharing means and how it helps to make immutable data structures efficient and practical. Scala is the primary implementation languages for most of the examples. At times, we also present Clojure snippets to illustrate the underlying fundamental theme. While writing code, we use ADTs (abstract data types). Stacks, Queues, Trees and Graphs are all familiar ADTs. You will see how these ADTs are implemented in a functional setting. We look at implementation techniques like amortization and lazy evaluation to ensure efficiency. By the end of the book, you will be able to write efficient functional data structures and algorithms for your applications. Style and approach Step-by-step topics will help you get started with functional programming. Learn by doing with hands-on code snippets that give you practical experience of the subject.

## Functional Programming Patterns in Scala and Clojure - Michael

Bevilacqua-Linn 2013

Solve real-life programming problems with a fraction of the code that pure object-oriented programming requires. Use Scala and Clojure to solve in-depth problems with two sets of patterns: object-oriented patterns that become more concise with functional programming, and natively functional patterns. Your code will be more declarative, with fewer bugs and lower maintenance costs.

Functional languages have their own patterns that enable you to solve problems with less code than object-oriented programming alone. This book introduces you, the experienced Java programmer, to Scala and Clojure: practical, production-quality languages that run on the JVM and interoperate with existing Java. By using both the statically typed, type-inferred Scala and the dynamically typed, modern Lisp Clojure, you'll gain a broad understanding of functional programming. For each pattern, you'll first see the traditional object-oriented solution, and then dig into the functional replacements in both Scala and Clojure. These patterns are common in the functional world and deserve to become part of your problem-solving toolkit. On the object-oriented side, you'll see many common patterns, such as Command, Strategy, and Null Object. On the functional side, you'll learn core functional patterns such as Memoization, Lazy Sequence, and Tail Recursion. Each pattern helps you solve a common programming problem. Working through them gives you a set of patterns you can use to solve problems you come across while writing programs. Finally, you'll learn how to work your existing Java code into new Scala or Clojure projects. You can start off small,

adding functional code little by little, so you can complement your existing knowledge with Scala and Clojure as these languages gain popularity on the JVM. What You Need Clojure 1.5 and Scala

2.10. Optionally, Eclipse with plugins.

Craft GraphQL APIs in Elixir with Absinthe - Bruce Williams 2018-03-27

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.

Functional Web Development with Elixir, OTP, and Phoenix - Lance Halvorsen 2018-01-25

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.

**Programming Elixir ≥ 1.6** - Dave Thomas 2018-05-18

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, 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. 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-level language, and a sense of adventure. No functional programming experience is needed.

#### Concurrent Data Processing in Elixir

- Svilen Gospodinov 2021-07-25

Learn different ways of writing concurrent code in Elixir and increase your application's performance, without sacrificing scalability or fault-tolerance. Most projects benefit from running background tasks and processing data concurrently, but the world of OTP and various libraries can be challenging. Which Supervisor and what strategy to use? What about GenServer? Maybe you need back-

pressure, but is GenStage, Flow, or Broadway a better choice? You will learn everything you need to know to answer these questions, start building highly concurrent applications in no time, and write code that's not only fast, but also resilient to errors and easy to scale. Whether you are building a high-frequency stock trading application or a consumer web app, you need to know how to leverage concurrency to build applications that are fast and efficient. Elixir and the OTP offer a range of powerful tools, and this guide will show you how to choose the best tool for each job, and use it effectively to quickly start building highly concurrent applications. Learn about Tasks, supervision trees, and the different types of Supervisors available to you. Understand why processes and process linking are the building blocks of concurrency in Elixir. Get comfortable with the OTP and use the GenServer behaviour to maintain process state for long-running jobs. Easily scale the number of running processes using the Registry. Handle large volumes of data and traffic spikes with GenStage, using back-pressure to your advantage. Create your first multi-stage data processing pipeline using producer, consumer, and producer-consumer stages. Process large collections with Flow, using MapReduce and more in parallel. Thanks to Broadway, you will see how easy it is to integrate with popular message broker systems, or even existing GenStage producers. Start building the high-performance and fault-tolerant applications Elixir is famous for today. What You Need: You'll need Elixir 1.9+ and Erlang/OTP 22+ installed on a Mac OS X, Linux, or Windows machine.

**Elixir in Action** - Sasa Juric  
2019-01-03

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 Jurić 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 Jurić 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