

Refactoring: Improving The Design Of Existing Code (Object Technology Series)

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

This book focuses on the methodological treatment of UML/P and addresses three core topics of model-based software development: code generation, the systematic testing of programs using a model-based definition of test cases, and the evolutionary refactoring and transformation of models. For each of these topics, it first details the foundational concepts and techniques, and then presents their application with UML/P. This separation between basic principles and applications makes the content more accessible and allows the reader to transfer this knowledge directly to other model-based approaches and languages. After an introduction to the book and its primary goals in Chapter 1, Chapter 2 outlines an agile UML-based approach using UML/P as the primary development language for creating executable models, generating code from the models, designing test cases, and planning iterative

evolution through refactoring. In the interest of completeness, Chapter 3 provides a brief summary of UML/P, which is used throughout the book. Next, Chapters 4 and 5 discuss core techniques for code generation, addressing the architecture of a code generator and methods for controlling it, as well as the suitability of UML/P notations for test or product code. Chapters 6 and 7 then discuss general concepts for testing software as well as the special features which arise due to the use of UML/P. Chapter 8 details test patterns to show how to use UML/P diagrams to define test cases and emphasizes in particular the use of functional tests for distributed and concurrent software systems. In closing, Chapters 9 and 10 examine techniques for transforming models and code and thus provide a solid foundation for refactoring as a type of transformation that preserves semantics. Overall, this book will be of great benefit for practical software development, for academic training in the field of Software Engineering, and for research in the area of model-based software development. Practitioners will learn how to use modern model-based techniques to improve the production of code and thus significantly increase quality. Students will find both important scientific basics as well as direct applications of the techniques presented. And

last but not least, the book will offer scientists a comprehensive overview of the current state of development in the three core topics it covers. Refactoring has proven its value in a wide range of development projects—helping software professionals improve system designs, maintainability, extensibility, and performance. Now, for the first time, leading agile methodologist Scott Ambler and renowned consultant Pramodkumar Sadalage introduce powerful refactoring techniques specifically designed for database systems. Ambler and Sadalage demonstrate how small changes to table structures, data, stored procedures, and triggers can significantly enhance virtually any database design—without changing semantics. You’ll learn how to evolve database schemas in step with source code—and become far more effective in projects relying on iterative, agile methodologies. This comprehensive guide and reference helps you overcome the practical obstacles to refactoring real-world databases by covering every fundamental concept underlying database refactoring. Using start-to-finish examples, the authors walk you through refactoring simple standalone database applications as well as sophisticated multi-application scenarios. You’ll master every task involved in refactoring database schemas, and

discover best practices for deploying refactorings in even the most complex production environments. The second half of this book systematically covers five major categories of database refactorings. You'll learn how to use refactoring to enhance database structure, data quality, and referential integrity; and how to refactor both architectures and methods. This book provides an extensive set of examples built with Oracle and Java and easily adaptable for other languages, such as C#, C++, or VB.NET, and other databases, such as DB2, SQL Server, MySQL, and Sybase. Using this book's techniques and examples, you can reduce waste, rework, risk, and cost—and build database systems capable of evolving smoothly, far into the future.

Five Lines of Code teaches refactoring that's focused on concrete rules and getting any method down to five lines or less! There's no jargon or tricky automated-testing skills required, just easy guidelines and patterns illustrated by detailed code samples. In Five Lines of Code you will learn: The signs of bad code Improving code safely, even when you don't understand it Balancing optimization and code generality Proper compiler practices The Extract method, Introducing Strategy pattern, and many other refactoring patterns Writing

stable code that enables change-by-addition Writing code that needs no comments Real-world practices for great refactoring Improving existing code—refactoring—is one of the most common tasks you'll face as a programmer. Five Lines of Code teaches you clear and actionable refactoring rules that you can apply without relying on intuitive judgements such as "code smells." Following the author's expert perspective—that refactoring and code smells can be learned by following a concrete set of principles—you'll learn when to refactor your code, what patterns to apply to what problem, and the code characteristics that indicate it's time for a rework. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Every codebase includes mistakes and inefficiencies that you need to find and fix. Refactor the right way, and your code becomes elegant, easy to read, and easy to maintain. In this book, you'll learn a unique approach to refactoring that implements any method in five lines or fewer. You'll also discover a secret most senior devs know: sometimes it's quicker to hammer out code and fix it later! About the book Five Lines of Code is a fresh look at refactoring for developers of all skill levels. In it, you'll master author Christian Clausen's innovative

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approach, learning concrete rules to get any method down to five lines—or less! You'll learn when to refactor, specific refactoring patterns that apply to most common problems, and characteristics of code that should be deleted altogether. What's inside The signs of bad code Improving code safely, even when you don't understand it Balancing optimization and code generality Proper compiler practices About the reader For developers of all skill levels.

Examples use easy-to-read Typescript, in the same style as Java and C#. About the author Christian Clausen works as a Technical Agile Coach, teaching teams how to refactor code.

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1 Refactoring refactoring 2 Looking under the hood of refactoring PART 1 LEARN BY REFACTORED A COMPUTER GAME 3 Shatter long function 4 Make type codes work 5 Fuse similar code together 6 Defend the data PART 2 TAKING WHAT YOU HAVE LEARNED INTO THE REAL WORLD 7 Collaborate with the compiler 8 Stay away from comments 9 Love deleting code 10 Never be afraid to add code 11 Follow the structure in the code 12 Avoid optimizations and generality 13 Make bad code look bad 14 Wrapping up

The Rails Way

The Pragmatic Programmer

Expert .NET 2.0 IL Assembler

Agile Modeling with UML

Refactoring Workbook

A Brief Guide to the Standard Object Modeling Language

Learn the principles of good software design, and how to turn those principles into great code. This book introduces you to software engineering – from the application of engineering principles to the development of software. You'll see how to run a software development project, examine the different phases of a project, and learn how to design and implement programs that solve specific problems. It's also about code construction – how to write great programs and make them work. Whether you're new to programming or have written hundreds of applications, in this book you'll re-examine what you already do, and you'll investigate ways to improve. Using the Java language, you'll look deeply into coding standards, debugging, unit testing, modularity, and other characteristics of good programs. With *Software Development, Design and Coding*, author and professor John Dooley distills his years of teaching

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and development experience to demonstrate practical techniques for great coding. What You'll Learn Review modern agile methodologies including Scrum and Lean programming Leverage the capabilities of modern computer systems with parallel programming Work with design patterns to exploit application development best practices Use modern tools for development, collaboration, and source code controls Who This Book Is For Early career software developers, or upper-level students in software engineering courses

How often do you hear people say things like this? "Our JavaScript is a mess, but we're thinking about using [framework of the month]." Like it or not, JavaScript is not going away. No matter what framework or "compiles-to-js" language or library you use, bugs and performance concerns will always be an issue if the underlying quality of your JavaScript is poor. Rewrites, including porting to the framework of the month, are terribly expensive and unpredictable. The bugs won't magically go away, and can happily reproduce themselves in a new context. To

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complicate things further, features will get dropped, at least temporarily. The other popular method of fixing your JS is playing "JavaScript Jenga," where each developer slowly and carefully takes their best guess at how the out-of-control system can be altered to allow for new features, hoping that this doesn't bring the whole stack of blocks down. This book provides clear guidance on how best to avoid these pathological approaches to writing JavaScript: Recognize you have a problem with your JavaScript quality. Forgive the code you have now, and the developers who made it. Learn repeatable, memorable, and time-saving refactoring techniques. Apply these techniques as you work, fixing things along the way. Internalize these techniques, and avoid writing as much problematic code to begin with. Bad code doesn't have to stay that way. And making it better doesn't have to be intimidating or unreasonably expensive. As the application of object technology--particularly the Java programming language--has become commonplace, a new problem has emerged

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to confront the software development community. Significant numbers of poorly designed programs have been created by less-experienced developers, resulting in applications that are inefficient and hard to maintain and extend. Increasingly, software system professionals are discovering just how difficult it is to work with these inherited, "non-optimal" applications. For several years, expert-level object programmers have employed a growing collection of techniques to improve the structural integrity and performance of such existing software programs. Referred to as "refactoring," these practices have remained in the domain of experts because no attempt has been made to transcribe the lore into a form that all developers could use. . .until now. In Refactoring: Improving the Design of Existing Code, renowned object technology mentor Martin Fowler breaks new ground, demystifying these master practices and demonstrating how software practitioners can realize the significant benefits of this new process. With proper training a skilled system designer can take a bad design

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and rework it into well-designed, robust code. In this book, Martin Fowler shows you where opportunities for refactoring typically can be found, and how to go about reworking a bad design into a good one. Each refactoring step is simple--seemingly too simple to be worth doing.

Refactoring may involve moving a field from one class to another, or pulling some code out of a method to turn it into its own method, or even pushing some code up or down a hierarchy. While these individual steps may seem elementary, the cumulative effect of such small changes can radically improve the design. Refactoring is a proven way to prevent software decay. In addition to discussing the various techniques of refactoring, the author provides a detailed catalog of more than seventy proven refactorings with helpful pointers that teach you when to apply them; step-by-step instructions for applying each refactoring; and an example illustrating how the refactoring works. The illustrative examples are written in Java, but the ideas are applicable to any object-

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oriented programming language.

For those considering Extreme Programming, this book provides no-nonsense advice on agile planning, development, delivery, and management taken from the authors' many years of experience. While plenty of books address the what and why of agile development, very few offer the information users can apply directly. your journey to mastery, 20th

Anniversary Edition

xUnit Test Patterns

The Rust Programming Language (Covers Rust 2018)

Implementation Patterns

Deep Learning for Coders with fastai and PyTorch

WORK EFFECT LEG CODE _p1

Thinking Forth applies a philosophy of problem solving and programming style to the unique programming language Forth. Published first in 1984, it could be among the timeless classics of computer books, such as Fred Brooks' The Mythical Man-Month and Donald Knuth's The Art of Computer Programming. Many software engineering principles discussed here have been rediscovered in eXtreme Programming, including (re)factoring, modularity, bottom-up and incremental design.

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Here you'll find all of those and more, such as the value of analysis and design, described in Leo Brodie's down-to-earth, humorous style, with illustrations, code examples, practical real life applications, illustrative cartoons, and interviews with Forth's inventor, Charles H. Moore as well as other Forth thinkers.

Many businesses and organizations depend on older high-value PHP software that risks abandonment because it is impossible to maintain. The reasons for this may be that the software is not well designed; there is only one developer (the one who created the system) who can develop it because he didn't use common design patterns and documentation; or the code is procedural, not object-oriented. With this book, you'll learn to identify problem code and refactor it to create more effective applications using test-driven design.

The Complete Guide to Writing Maintainable, Manageable, Pleasing, and Powerful Object-Oriented Applications Object-oriented programming languages exist to help you create beautiful, straightforward applications that are easy to change and simple to extend. Unfortunately, the world is awash with object-oriented (OO) applications that are difficult to understand and expensive to change. Practical Object-Oriented Design, Second Edition, immerses you in an OO mindset and teaches you powerful, real-world, object-oriented design techniques

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with simple and practical examples. Sandi Metz demonstrates how to build new applications that can “survive success” and repair existing applications that have become impossible to change. Each technique is illustrated with extended examples in the easy-to-understand Ruby programming language, all downloadable from the companion website, poodr.com. Fully updated for Ruby 2.5, this guide shows how to

- Decide what belongs in a single class
- Avoid entangling objects that should be kept separate
- Define flexible interfaces among objects
- Reduce programming overhead costs with duck typing
- Successfully apply inheritance
- Build objects via composition

Whatever your previous object-oriented experience, this concise guide will help you achieve the superior outcomes you’re looking for. Register your book for convenient access to downloads, updates, and/or corrections as they become available. See inside book for details.

The expert guide to building Ruby on Rails applications Ruby on Rails strips complexity from the development process, enabling professional developers to focus on what matters most: delivering business value. Now, for the first time, there’s a comprehensive, authoritative guide to building production-quality software with Rails. Pioneering Rails developer Obie Fernandez and a team of experts illuminate the entire Rails API, along with the Ruby idioms, design approaches, libraries, and plug-ins that make

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Rails so valuable. Drawing on their unsurpassed experience, they address the real challenges development teams face, showing how to use Rails' tools and best practices to maximize productivity and build polished applications users will enjoy. Using detailed code examples, Obie systematically covers Rails' key capabilities and subsystems. He presents advanced programming techniques, introduces open source libraries that facilitate easy Rails adoption, and offers important insights into testing and production deployment. Dive deep into the Rails codebase together, discovering why Rails behaves as it does— and how to make it behave the way you want it to. This book will help you Increase your productivity as a web developer Realize the overall joy of programming with Ruby on Rails Learn what's new in Rails 2.0 Drive design and protect long-term maintainability with TestUnit and RSpec Understand and manage complex program flow in Rails controllers Leverage Rails' support for designing REST-compliant APIs Master sophisticated Rails routing concepts and techniques Examine and troubleshoot Rails routing Make the most of ActiveRecord object-relational mapping Utilize Ajax within your Rails applications Incorporate logins and authentication into your application Extend Rails with the best third-party plug-ins and write your own Integrate email services into your applications with ActionMailer Choose the right Rails production configurations

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Streamline deployment with Capistrano
Prefactoring

UML Distilled

Improving the Design of Existing Web Applications

Refactoring: Improving The Design Of Existing Code

Working Effectively with Legacy Code

Domain-Specific Languages

Looks at the principles and clean code, includes case studies showcasing the practices of writing clean code, and contains a list of heuristics and "smells" accumulated from the process of writing clean code.

Presents a process called "prefactoring," the premise of which states that you're better off considering the best possible design patterns before you even begin your projects. This book presents prefactoring guidelines in design, code, and testing, derived from lessons learned by many developers over the years.

Software Expert Kent Beck Presents a Catalog of Patterns Infinitely Useful for Everyday Programming Great code doesn't just function: it clearly and consistently communicates your

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intentions, allowing other programmers to understand your code, rely on it, and modify it with confidence. But great code doesn't just happen. It is the outcome of hundreds of small but critical decisions programmers make every single day. Now, legendary software innovator Kent Beck—known worldwide for creating Extreme Programming and pioneering software patterns and test-driven development—focuses on these critical decisions, unearthing powerful “implementation patterns” for writing programs that are simpler, clearer, better organized, and more cost effective. Beck collects 77 patterns for handling everyday programming tasks and writing more readable code. This new collection of patterns addresses many aspects of development, including class, state, behavior, method, collections, frameworks, and more. He uses diagrams, stories, examples, and essays to engage the reader as he illuminates the patterns. You'll find proven solutions for handling everything from naming variables to checking exceptions.

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This classic book is the definitive real-world style guide for better Smalltalk programming. This author presents a set of patterns that organize all the informal experience successful Smalltalk programmers have learned the hard way. When programmers understand these patterns, they can write much more effective code. The concept of Smalltalk patterns is introduced, and the book explains why they work. Next, the book introduces proven patterns for working with methods, messages, state, collections, classes and formatting. Finally, the book walks through a development example utilizing patterns. For programmers, project managers, teachers and students -- both new and experienced. This book presents a set of patterns that organize all the informal experience of successful Smalltalk programmers. This book will help you understand these patterns, and empower you to write more effective code.

*Code Generation, Testing, Refactoring
An Agile Primer Using Ruby
Improving the Design of Existing Code*

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Five Lines of Code

Thinking Forth

Evolutionary Database Design

(paperback)

Awareness of design smells - indicators of common design problems - helps developers or software engineers understand mistakes made while designing, what design principles were overlooked or misapplied, and what principles need to be applied properly to address those smells through refactoring. Developers and software engineers may "know" principles and patterns, but are not aware of the "smells" that exist in their design because of wrong or misapplication of principles or patterns. These smells tend to contribute heavily to technical debt - further time owed to fix projects thought to be complete - and need to be addressed via proper refactoring. *Refactoring for Software Design Smells* presents 25 structural design smells, their role in identifying design issues, and potential refactoring solutions. Organized across common areas of software design, each smell is presented with diagrams and examples illustrating the poor design practices and the problems that result, creating a catalog of nuggets of readily usable information that developers or engineers can apply in their projects. The authors distill their research and experience as consultants and trainers, providing insights that have been used to improve refactoring and reduce the time and

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costs of managing software projects. Along the way they recount anecdotes from actual projects on which the relevant smell helped address a design issue. Contains a comprehensive catalog of 25 structural design smells (organized around four fundamental design principles) that contribute to technical debt in software projects Presents a unique naming scheme for smells that helps understand the cause of a smell as well as points toward its potential refactoring Includes illustrative examples that showcase the poor design practices underlying a smell and the problems that result Covers pragmatic techniques for refactoring design smells to manage technical debt and to create and maintain high-quality software in practice Presents insightful anecdotes and case studies drawn from the trenches of real-world projects

The official book on the Rust programming language, written by the Rust development team at the Mozilla Foundation, fully updated for Rust 2018. The Rust Programming Language is the official book on Rust: an open source systems programming language that helps you write faster, more reliable software. Rust offers control over low-level details (such as memory usage) in combination with high-level ergonomics, eliminating the hassle traditionally associated with low-level languages. The authors of The Rust Programming Language, members of the Rust Core Team, share their knowledge and

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experience to show you how to take full advantage of Rust's features--from installation to creating robust and scalable programs. You'll begin with basics like creating functions, choosing data types, and binding variables and then move on to more advanced concepts, such as:

- Ownership and borrowing, lifetimes, and traits
- Using Rust's memory safety guarantees to build fast, safe programs
- Testing, error handling, and effective refactoring
- Generics, smart pointers, multithreading, trait objects, and advanced pattern matching
- Using Cargo, Rust's built-in package manager, to build, test, and document your code and manage dependencies
- How best to use Rust's advanced compiler with compiler-led programming techniques

You'll find plenty of code examples throughout the book, as well as three chapters dedicated to building complete projects to test your learning: a number guessing game, a Rust implementation of a command line tool, and a multithreaded server. New to this edition: An extended section on Rust macros, an expanded chapter on modules, and appendixes on Rust development tools and editions.

In 1994, Design Patterns changed the landscape of object-oriented development by introducing classic solutions to recurring design problems. In 1999, Refactoring revolutionized design by introducing an effective process for improving code. With the highly anticipated Refactoring to Patterns , Joshua Kerievsky has changed our

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approach to design by forever uniting patterns with the evolutionary process of refactoring. This book introduces the theory and practice of pattern-directed refactorings: sequences of low-level refactorings that allow designers to safely move designs to, towards, or away from pattern implementations. Using code from real-world projects, Kerievsky documents the thinking and steps underlying over two dozen pattern-based design transformations. Along the way he offers insights into pattern differences and how to implement patterns in the simplest possible ways. Coverage includes: A catalog of twenty-seven pattern-directed refactorings, featuring real-world code examples Descriptions of twelve design smells that indicate the need for this book's refactorings General information and new insights about patterns and refactoring Detailed implementation mechanics: how low-level refactorings are combined to implement high-level patterns Multiple ways to implement the same pattern—and when to use each Practical ways to get started even if you have little experience with patterns or refactoring Refactoring to Patterns reflects three years of refinement and the insights of more than sixty software engineering thought leaders in the global patterns, refactoring, and agile development communities. Whether you're focused on legacy or "greenfield" development, this book will make you a better software

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designer by helping you learn how to make important design changes safely and effectively. The practice of enterprise application development has benefited from the emergence of many new enabling technologies. Multi-tiered object-oriented platforms, such as Java and .NET, have become commonplace. These new tools and technologies are capable of building powerful applications, but they are not easily implemented. Common failures in enterprise applications often occur because their developers do not understand the architectural lessons that experienced object developers have learned. Patterns of Enterprise Application Architecture is written in direct response to the stiff challenges that face enterprise application developers. The author, noted object-oriented designer Martin Fowler, noticed that despite changes in technology--from Smalltalk to CORBA to Java to .NET--the same basic design ideas can be adapted and applied to solve common problems. With the help of an expert group of contributors, Martin distills over forty recurring solutions into patterns. The result is an indispensable handbook of solutions that are applicable to any enterprise application platform. This book is actually two books in one. The first section is a short tutorial on developing enterprise applications, which you can read from start to finish to understand the scope of the book's lessons. The next section, the bulk of the book, is a detailed reference to the

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patterns themselves. Each pattern provides usage and implementation information, as well as detailed code examples in Java or C#. The entire book is also richly illustrated with UML diagrams to further explain the concepts. Armed with this book, you will have the knowledge necessary to make important architectural decisions about building an enterprise application and the proven patterns for use when building them. The topics covered include

- Dividing an enterprise application into layers
- The major approaches to organizing business logic
- An in-depth treatment of mapping between objects and relational databases
- Using Model-View-Controller to organize a Web presentation
- Handling concurrency for data that spans multiple transactions
- Designing distributed object interfaces

An Agile Primer

Practical Object-oriented Design in Ruby

Refactoring

Refactoring Object-Oriented Frameworks

How and when to refactor

The Art of Agile Development

More than 300,000 developers have benefited from past editions of UML Distilled . This third edition is the best resource for quick, no-nonsense insights into understanding and using UML 2.0 and prior versions of the UML. Some readers will want to quickly get up to speed with the UML 2.0 and learn the essentials of the UML. Others will use this book as a handy, quick reference to the most common parts of the UML. The author delivers on both of these promises in a

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short, concise, and focused presentation. This book describes all the major UML diagram types, what they're used for, and the basic notation involved in creating and deciphering them. These diagrams include class, sequence, object, package, deployment, use case, state machine, activity, communication, composite structure, component, interaction overview, and timing diagrams. The examples are clear and the explanations cut to the fundamental design logic. Includes a quick reference to the most useful parts of the UML notation and a useful summary of diagram types that were added to the UML 2.0. If you are like most developers, you don't have time to keep up with all the new innovations in software engineering. This new edition of Fowler's classic work gets you acquainted with some of the best thinking about efficient object-oriented software design using the UML--in a convenient format that will be essential to anyone who designs software professionally.

Users can dramatically improve the design, performance, and manageability of object-oriented code without altering its interfaces or behavior. "Refactoring" shows users exactly how to spot the best opportunities for refactoring and exactly how to do it, step by step.

Like any other software system, Web sites gradually accumulate "cruft" over time. They slow down. Links break. Security and compatibility problems mysteriously appear. New features don't integrate seamlessly. Things just don't work as well. In an ideal world, you'd rebuild from scratch. But you can't: there's no time or money for that. Fortunately, there's a solution: You can refactor your Web code using easy, proven techniques, tools, and recipes adapted from the world of software development. In Refactoring HTML, Elliott Rusty Harold explains how to use refactoring to improve virtually any Web site or application. Writing for programmers and non-programmers alike, Harold shows how to refactor for

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better reliability, performance, usability, security, accessibility, compatibility, and even search engine placement. Step by step, he shows how to migrate obsolete code to today ' s stable Web standards, including XHTML, CSS, and REST—and eliminate chronic problems like presentation-based markup, stateful applications, and “tag soup.” The book ' s extensive catalog of detailed refactorings and practical “recipes for success” are organized to help you find specific solutions fast, and get maximum benefit for minimum effort. Using this book, you can quickly improve site performance now—and make your site far easier to enhance, maintain, and scale for years to come. Topics covered include • Recognizing the “smells” of Web code that should be refactored • Transforming old HTML into well-formed, valid XHTML, one step at a time • Modernizing existing layouts with CSS • Updating old Web applications: replacing POST with GET, replacing old contact forms, and refactoring JavaScript • Systematically refactoring content and links • Restructuring sites without changing the URLs your users rely upon This book will be an indispensable resource for Web designers, developers, project managers, and anyone who maintains or updates existing sites. It will be especially helpful to Web professionals who learned HTML years ago, and want to refresh their knowledge with today ' s standards-compliant best practices. This book will be an indispensable resource for Web designers, developers, project managers, and anyone who maintains or updates existing sites. It will be especially helpful to Web professionals who learned HTML years ago, and want to refresh their knowledge with today ' s standards-compliant best practices.

& Most software practitioners deal with inherited code; this book teaches them how to optimize it & & Workbook approach facilitates the learning process & & Helps you identify where problems in a software application exist or are

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likely to exist

Principle-Based Refactoring

Software Development, Design and Coding

Refactoring Test Code

Smalltalk Best Practice Patterns

Managing Technical Debt

Refactoring at Scale

Deep learning is often viewed as the exclusive domain of math PhDs and big tech companies. But as this hands-on guide demonstrates, programmers comfortable with Python can achieve impressive results in deep learning with little math background, small amounts of data, and minimal code. How? With fastai, the first library to provide a consistent interface to the most frequently used deep learning applications. Authors Jeremy Howard and Sylvain Gugger, the creators of fastai, show you how to train a model on a wide range of tasks using fastai and PyTorch. You'll also dive progressively further into deep learning theory to gain a complete understanding of the algorithms behind the scenes. Train models in computer vision, natural language processing, tabular data, and collaborative filtering Learn the latest deep learning techniques that matter most in practice Improve accuracy, speed, and reliability by understanding how deep learning models work Discover how to turn your models into web applications Implement deep learning algorithms from scratch Consider the ethical implications of your work Gain insight from the foreword by PyTorch cofounder, Soumith Chintala "One of the most significant books in my life." –Obie

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Fernandez, Author, The Rails Way "Twenty years ago, the first edition of The Pragmatic Programmer completely changed the trajectory of my career. This new edition could do the same for yours." –Mike Cohn, Author of Succeeding with Agile, Agile Estimating and Planning, and User Stories Applied ". . . filled with practical advice, both technical and professional, that will serve you and your projects well for years to come" –Andrea Goulet, CEO, Corgibytes, Founder, LegacyCode.Rocks ". . . lightning does strike twice, and this book is proof." –VM (Vicky) Brasseur, Director of Open Source Strategy, Juniper Networks The Pragmatic Programmer is one of those rare tech books you'll read, re-read, and read again over the years. Whether you're new to the field or an experienced practitioner, you'll come away with fresh insights each and every time. Dan Thomas and Andy Hunt wrote the first edition of this influential book in 1999 to help their clients create better software and rediscover the joy of coding. These lessons have helped a generation of programmers examine the very essence of software development, independent of any particular language, framework, or methodology, and the Pragmatic philosophy has spawned hundreds of books, screencasts, and audio books, as well as thousands of careers and success stories. Now, twenty years later, this new edition re-examines what it means to be a modern programmer. Topics range from personal responsibility and career development to architectural techniques for keeping your code flexible and easy to

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adapt and reuse. Read this book, and you'll learn how to:

- Fight software rot
- Learn continuously
- Avoid the trap of duplicating knowledge
- Write flexible, dynamic, and adaptable code
- Harness the power of basic tools
- Avoid programming by coincidence
- Learn real requirements
- Solve the underlying problems of concurrent code
- Guard against security vulnerabilities
- Build teams of Pragmatic Programmers
- Take responsibility for your work and career
- Test ruthlessly and effectively, including property-based testing
- Implement the Pragmatic Starter Kit
- Delight your users

Written as a series of self-contained sections and filled with classic and fresh anecdotes, thoughtful examples, and interesting analogies, *The Pragmatic Programmer* illustrates the best approaches 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. Register your book for convenient access to downloads, updates, and/or corrections as they become available. See inside book for details.

The Complete Guide to Writing More Maintainable, Manageable, Pleasing, and Powerful Ruby Applications

Ruby's widely admired ease of use has a downside: Too

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many Ruby and Rails applications have been created without concern for their long-term maintenance or evolution. The Web is awash in Ruby code that is now virtually impossible to change or extend. This text helps you solve that problem by using powerful real-world object-oriented design techniques, which it thoroughly explains using simple and practical Ruby examples. Sandi Metz has distilled a lifetime of conversations and presentations about object-oriented design into a set of Ruby-focused practices for crafting manageable, extensible, and pleasing code. She shows you how to build new applications that can survive success and repair existing applications that have become impossible to change. Each technique is illustrated with extended examples, all downloadable from the companion Web site, poodr.info. The first title to focus squarely on object-oriented Ruby application design, *Practical Object-Oriented Design in Ruby* will guide you to superior outcomes, whatever your previous Ruby experience. Novice Ruby programmers will find specific rules to live by; intermediate Ruby programmers will find valuable principles they can flexibly interpret and apply; and advanced Ruby programmers will find a common language they can use to lead development and guide their colleagues. This guide will help you understand how object-oriented programming can help you craft Ruby code that is easier to maintain and upgrade. Decide what belongs in a single Ruby class. Avoid entangling objects that should be kept separate. Define flexible

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interfaces among objects Reduce programming overhead costs with duck typing Successfully apply inheritance Build objects via composition Design cost-effective tests Solve common problems associated with poorly designed Ruby code

Automated testing is a cornerstone of agile development. An effective testing strategy will deliver new functionality more aggressively, accelerate user feedback, and improve quality. However, for many developers, creating effective automated tests is a unit and unfamiliar challenge. xUnit Test Patterns is the definitive guide to writing automated tests using xUnit, the most popular unit testing framework in use today. Agile coach and test automation expert Gerard Meszaros describes 68 proven patterns for making tests easier to write, understand, and maintain. He then shows you how to make them more robust and repeatable--and far more cost-effective. Loaded with information, this book feels like three books in one. The first part is a detailed tutorial on test automation that covers everything from test strategy to in-depth test coding. The second part is a catalog of 18 frequently encountered "test smells," provides trouble-shooting guidelines to help you determine the root cause of problems and the most applicable patterns. The third part contains detailed descriptions of each pattern, including refactoring instructions illustrated by extensive code samples in multiple programming languages.

Pro PHP Refactoring

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Refactoring JavaScript

Refactoring Databases

Clean Code

Practical Object-Oriented Design

Pattern Enterprise Application Architecture

You know good software when you see it, but how do you explain what good software is? Experienced software developers have pet practices and techniques that make their software easier to test, maintain and understand. But when you ask them how to make your software like theirs, they give you a seemingly endless list of rules. How can they remember all those rules? The secret is that they don't! Instead, experienced software developers understand a handful of basic principles. The rules are merely manifestations of these basic principles. But, principles are hard to explain; so experienced developers resort to explaining rules instead. In *Principle-Based Refactoring*, Halladay explains a set of software refactoring rules and links the refactoring rules back to the basic principles that drive robust software design. The book identifies eight fundamental design principles and also includes a set of approximately fifty refactoring rules that illustrate the principles. Each rule has a summary description, a discussion, including references back to the driving principles, and examples of the rules' applications. In addition, this book discusses refactoring mechanics including test strategies that guide software developers in verifying the quality of refactored code. Fully Revised and Updated—Includes New Refactorings and Code Examples “Any fool can write code that a computer can understand. Good programmers write code that humans can understand.” —M. Fowler (1999) For more than twenty years, experienced programmers worldwide have relied on Martin Fowler's *Refactoring* to improve the design of existing code

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and to enhance software maintainability, as well as to make existing code easier to understand. This eagerly awaited new edition has been fully updated to reflect crucial changes in the programming landscape. Refactoring, Second Edition, features an updated catalog of refactorings and includes JavaScript code examples, as well as new functional examples that demonstrate refactoring without classes. Like the original, this edition explains what refactoring is; why you should refactor; how to recognize code that needs refactoring; and how to actually do it successfully, no matter what language you use. Understand the process and general principles of refactoring Quickly apply useful refactorings to make a program easier to comprehend and change Recognize “bad smells” in code that signal opportunities to refactor Explore the refactorings, each with explanations, motivation, mechanics, and simple examples Build solid tests for your refactorings Recognize tradeoffs and obstacles to refactoring Includes free access to the canonical web edition, with even more refactoring resources. (See inside the book for details about how to access the web edition.)

Get more out of your legacy systems: more performance, functionality, reliability, and manageability Is your code easy to change? Can you get nearly instantaneous feedback when you do change it? Do you understand it? If the answer to any of these questions is no, you have legacy code, and it is draining time and money away from your development efforts. In this book, Michael Feathers offers start-to-finish strategies for working more effectively with large, untested legacy code bases. This book draws on material Michael created for his renowned Object Mentor seminars: techniques Michael has used in mentoring to help hundreds of developers, technical managers, and testers bring their legacy systems under control. The topics covered include Understanding the mechanics of software change; adding features, fixing bugs,

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improving design, optimizing performance Getting legacy code into a test harness Writing tests that protect you against introducing new problems Techniques that can be used with any language or platform—with examples in Java, C++, C, and C# Accurately identifying where code changes need to be made Coping with legacy systems that aren't object-oriented Handling applications that don't seem to have any structure This book also includes a catalog of twenty-four dependency-breaking techniques that help you work with program elements in isolation and make safer changes.

.NET 2.0 IL (Intermediate Language) is the foundation language at the root of all the .NET languages. It is this code which is compiled and executed by the .NET 2.0 Framework. As a result of this absolutely anything that can be expressed in IL can be carried out by the .NET 2.0 Framework. This book gives readers inside information on the language's architecture straight from the most reliable possible source – Serge Lidin, the language's designer.

Turning Bad Code Into Good Code

Refactoring HTML

Refactoring for Software Design Smells

Fowler

Refactoring: Improving the Design of Existing Code

The Object-Oriented Thought Process

Test-Driven Development (TDD) is now an established technique for delivering better software faster. TDD is based on a simple idea: Write tests for your code before you write the code itself. However, this "simple" idea takes skill and judgment to do well. Now there's a practical guide to TDD that takes you beyond the basic concepts.

Drawing on a decade of experience building real-world systems, two TDD pioneers show how to let tests guide your development and “grow” software that is coherent,

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reliable, and maintainable. Steve Freeman and Nat Pryce describe the processes they use, the design principles they strive to achieve, and some of the tools that help them get the job done. Through an extended worked example, you'll learn how TDD works at multiple levels, using tests to drive the features and the object-oriented structure of the code, and using Mock Objects to discover and then describe relationships between objects. Along the way, the book systematically addresses challenges that development teams encounter with TDD—from integrating TDD into your processes to testing your most difficult features. Coverage includes Implementing TDD effectively: getting started, and maintaining your momentum throughout the project Creating cleaner, more expressive, more sustainable code Using tests to stay relentlessly focused on sustaining quality Understanding how TDD, Mock Objects, and Object-Oriented Design come together in the context of a real software development project Using Mock Objects to guide object-oriented designs Succeeding where TDD is difficult: managing complex test data, and testing persistence and concurrency

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

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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

Object-oriented programming (OOP) is the foundation of modern programming languages, including C++, Java, C#, Visual Basic .NET, Ruby, Objective-C, and Swift. Objects also form the basis for many web technologies such as JavaScript, Python, and PHP. It is of vital importance to learn the fundamental concepts of object orientation before starting to use object-oriented development environments. OOP promotes good design practices, code portability, and reuse—but it requires a shift in thinking to be fully understood. Programmers new to OOP should resist the temptation to jump directly into a particular programming language or a modeling language, and instead first take the time to learn what author Matt Weisfeld calls “the object-oriented thought process.” Written by a developer for developers who want to improve their understanding of object-oriented technologies, *The Object-Oriented Thought Process* provides a solutions-oriented approach to object-oriented

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programming. Readers will learn to understand the proper uses of inheritance and composition, the difference between aggregation and association, and the important distinction between interfaces and implementations. While programming technologies have been changing and evolving over the years, object-oriented concepts remain a constant—no matter what the platform. This revised edition focuses on the OOP technologies that have survived the past 20 years and remain at its core, with new and expanded coverage of design patterns, avoiding dependencies, and the SOLID principles to help make software designs understandable, flexible, and maintainable.

Refactoring to Patterns

Growing Object-Oriented Software, Guided by Tests

A Handbook of Agile Software Craftsmanship

With Patterns, Debugging, Unit Testing, and Refactoring

Learning Software Design Principles by Applying

Refactoring Rules