



# REFACTORING

## IMPROVING THE DESIGN OF EXISTING CODE

**MARTIN FOWLER**

With contributions by **Kent Beck, John Brant,  
William Opdyke, and Don Roberts**

Foreword by **Erich Gamma**  
Object Technology International, Inc.



# Refactoring Improving The Design Of Existing Code

**Jessica J Manson**



## **Refactoring Improving The Design Of Existing Code:**

*Refactoring* Martin Fowler, Kent Beck, John Brant, William Opdyke, Don Roberts, 2012-03-09 As the application of object technology particularly the Java programming language has become commonplace a new problem has emerged 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 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 oriented programming language

**Refactoring** Martin Fowler, 2018-11-20 Martin Fowler's guide to reworking bad code into well structured code Refactoring improves the design of existing code and enhances software maintainability as well as making existing code easier to understand Original Agile Manifesto signer and software development thought leader Martin Fowler provides a catalog of refactorings that explains why you should refactor how to recognize code that needs refactoring and how to actually do it successfully no matter what language you use Refactoring principles understand the process and general principles of refactoring Code smells recognize bad smells in code that signal opportunities to refactor Application improvement quickly apply useful refactorings to make a program easier to comprehend and change Building tests writing good tests increases a programmer's effectiveness Moving features an important part of refactoring is moving elements between contexts Data structures a collection of refactorings to organize data an important role in programs Conditional Logic use refactorings to make conditional sections easier to understand APIs modules and their

functions are the building blocks of our software and APIs are the joints that we use to plug them together Inheritance it is both very useful and easy to misuse and it s often hard to see the misuse until it s in the rear view mirror refactorings can fix the misuse Examples are written in JavaScript but you shouldn t find it difficult to adapt the refactorings to whatever language you are currently using as they look mostly the same in different languages Whenever you read Refactoring it s time to read it again And if you haven t read it yet please do before writing another line of code David Heinemeier Hansson Creator of Ruby on Rails Founder CTO at Basecamp Any fool can write code that a computer can understand Good programmers write code that humans can understand M Fowler 1999     **Refactoring** Martin Fowler,Kent Beck,1999 Refactoring is gaining momentum amongst the object oriented programming community It can transform the internal dynamics of applications and has the capacity to transform bad code into good code This book offers an introduction to refactoring     REFACTORING IMPROVING THE DESIGN OF EXISTING CODE. MATRIN. FOWLER,1999     *Refactoring* Martin Fowler,2009     **Proceedings of the IEEE International Symposium on Industrial Electronics** ,2001

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support product lines Designing Software Product Lines with UML shows how to employ the latest version of the industry standard Unified Modeling Language UML 2.0 to reuse software requirements and architectures rather than starting the development of each new system from scratch Through real world case studies the book illustrates the fundamental concepts and technologies used in the design and implementation of software product lines This book describes a new UML based software design method for product lines called PLUS Product Line UML based Software engineering PLUS provides a set of concepts and techniques to extend UML based design methods and processes for single systems in a new dimension to address software product lines Using PLUS the objective is to explicitly model the commonality and variability in a software product line Hassan Gomaa explores how each of the UML modeling views use case static state machine and interaction modeling can be extended to address software product families He also discusses how software architectural patterns can be used to develop a reusable component based architecture for a product line and how to express this architecture as a UML platform independent model that can then be mapped to a platform specific model Key topics include Software product line engineering process which extends the Unified Development Software Process to address software product lines Use case modeling including modeling the common and variable functionality of a product line Incorporating feature modeling into UML for modeling common optional and alternative product line features Static modeling including modeling the boundary of the product line and information intensive entity classes Dynamic modeling including using interaction modeling to address use case variability State machines for modeling state dependent variability Modeling class variability using inheritance and parameterization Software architectural patterns for product lines Component based distributed design using the new UML 2.0 capability for modeling components connectors ports and provided and required interfaces Detailed case studies giving a step by step solution to real world product line problems Designing Software Product Lines with UML is an invaluable resource for all designers and developers in this growing field The information technology and case studies presented here show how to harness the promise of software product lines and the practicality of the UML to take software design quality and efficiency to the next level An enhanced online index allows readers to quickly and easily search the entire text for specific topics

**Object-oriented Information Systems**, 2002 *Journal of Object-oriented Programming*, 2001

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