

Effective Unit Testing A For Java Developers

JUnit in Action, Third Edition has been completely rewritten for this release. The book is full of examples that demonstrate JUnit's modern features, including its new architecture; nested, tagged, and dynamic tests; and dependency injection. Summary JUnit is the gold standard for unit testing Java applications. Filled with powerful new features designed to automate software testing, JUnit 5 boosts your productivity and helps avoid debugging nightmares. Whether you're just starting with JUnit or you want to ramp up on the new features, JUnit in Action, Third Edition has you covered. Extensively revised with new code and new chapters, JUnit in Action, Third Edition is an up-to-date guide to smooth software testing. Dozens of hands-on examples illustrate JUnit 5's innovations for dependency injection, nested testing, parameterized tests, and more. Throughout, you'll learn how to use JUnit 5 to automate your testing, for a process that consumes less resources, and gives you more time for developing. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications.

About the technology The JUnit framework is the gold standard for unit testing Java applications—and knowing it is an essential skill for Java developers. The latest version, JUnit 5, is a total overhaul, now supporting modern Java features like Lambdas and Streams. About the book JUnit in Action, Third Edition has been completely rewritten for this release. The book is full of examples that demonstrate JUnit's modern features, including its new architecture; nested, tagged, and dynamic tests; and dependency injection. You'll benefit from author Catalin Tudose's unique "pyramid" testing strategy, which breaks the testing process into layers and sets you on the path to bug-free code creation. What's inside Migrating from JUnit 4

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to 5 Effective test automation Test-driven development and behavior-driven development Using mocks for test isolation Connecting JUnit 5 with Maven or Gradle About the reader For intermediate Java developers. About the author Catalin Tudose has a Ph.D. in Computer Science, and over 15 years of experience as a Senior Java Developer and Technical Team Lead. Previous editions were authored by Petar Tahchiev, Felipe Leme, Gary Gregory, and Vincent Massol. Table of Contents PART 1 - JUNIT 1 JUnit jump-start 2 Exploring core JUnit 3 JUnit architecture 4 Migrating from JUnit 4 to JUnit 5 5 Software testing principles PART 2 - DIFFERENT TESTING STRATEGIES 6 Test quality 7 Coarse-grained testing with stubs 8 Testing with mock objects 9 In-container testing PART 3 - WORKING WITH JUNIT 5 AND OTHER TOOLS 10 Running JUnit tests from Maven 3 11 Running JUnit tests from Gradle 6 12 JUnit 5 IDE support 13 Continuous integration with JUnit 5 PART 4 - WORKING WITH MODERN FRAMEWORKS AND JUNIT 5 14 JUnit 5 extension model 15 Presentation-layer testing 16 Testing Spring applications 17 Testing Spring Boot applications 18 Testing a REST API 19 Testing database applications PART 5 - DEVELOPING APPLICATIONS WITH JUNIT 5 20 Test-driven development with JUnit 5 21 Behavior-driven development in JUnit 5 22 Implementing a test pyramid strategy with JUnit 5

This book explains in detail how to implement unit tests using two very popular open source Java technologies: JUnit and Mockito. It presents a range of techniques necessary to write high quality unit tests - e.g. mocks, parametrized tests and matchers. It also discusses trade-offs related to the choices we have to make when dealing with some real-life code issues. The book stresses the importance of writing readable and maintainable unit tests, and puts a lot of stress on code quality. It shows how to achieve testable code and to eliminate common

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mistakes by following the Test Driven Development approach. Every topic discussed in the book is illustrated with code examples, and each chapter is accompanied by some exercises. By reading this book you will: Grasp the role and purpose of unit tests Write high-quality, readable and maintainable unit tests Learn how to use JUnit and Mockito (but also other useful tools) Avoid common pitfalls when writing unit tests Recognize bad unit tests, and fix them in no time Develop code following the Test Driven Development (TDD) approach Use mocks, stubs and test-spies intelligently Measure the quality of your tests using code coverage and mutation testing Learn how to improve your tests' code so it is an asset and not a burden Test collections, expected exceptions, time-dependent methods and much more Customize test reports so that they show you what you really need to know Master tools and techniques your team members have never even heard of (priceless!):) Nowadays every developer is expected to write unit tests. While simple in theory, in practice writing high-quality unit tests can turn out to be a real challenge. This book will help.

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, 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-

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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

Summary Testing Vue.js Applications is a comprehensive guide to testing Vue components, methods, events, and output. Author Edd Yerburgh, creator of the Vue testing utility, explains the best testing practices in Vue along with an evergreen methodology that applies to any web dev process. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Web developers who use the Vue framework love its reliability, speed, small footprint, and versatility. Vue's component-based approach and use of DOM methods require you to adapt your app-testing practices. Learning Vue-specific testing tools and strategies will ensure your apps run like they should. About the Book With Testing Vue.js Applications, you'll discover effective testing methods for Vue applications. You'll enjoy author Edd Yerburgh's engaging style and fun real-world examples as you learn to use the Jest framework to run tests for a Hacker News application built with Vue, Vuex, and Vue Router. This comprehensive guide teaches the best testing practices in

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Vue along with an evergreen methodology that applies to any web dev process. What's inside Unit tests, snapshot tests, and end-to-end tests Writing unit tests for Vue components Writing tests for Vue mixins, Vuex, and Vue Router Advanced testing techniques, like mocking About the Reader Written for Vue developers at any level. About the Author Edd Yerburgh is a JavaScript developer and Vue core team member. He's the main author of the Vue Test Utils library and is passionate about open source tooling for testing component-based applications. Table of Contents Introduction to testing Vue applications Creating your first test Testing rendered component output Testing component methods Testing events Understanding Vuex Testing Vuex Organizing tests with factory functions Understanding Vue Router Testing Vue Router Testing mixins and filters Writing snapshot tests Testing server-side rendering Writing end-to-end tests APPENDIXES A - Setting up your environment B - Running the production build C - Exercise answers

If you program in C++ you've been neglected. Test-driven development (TDD) is a modern software development practice that can dramatically reduce the number of defects in systems, produce more maintainable code, and give you the confidence to change your software to meet changing needs. But C++ programmers have been ignored by those promoting TDD--until now. In this book, Jeff Langr gives you hands-on lessons in the challenges and rewards of doing TDD in C++. Modern C++ Programming With Test-Driven Development, the only comprehensive treatment on TDD in C++ provides you with everything you need to know about TDD, and the challenges and benefits of implementing it in your C++ systems. Its many detailed code examples take you step-by-step from TDD basics to advanced concepts. As a veteran C++ programmer, you're already writing high-quality code, and you work hard to

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maintain code quality. It doesn't have to be that hard. In this book, you'll learn: how to use TDD to improve legacy C++ systems how to identify and deal with troublesome system dependencies how to do dependency injection, which is particularly tricky in C++ how to use testing tools for C++ that aid TDD new C++11 features that facilitate TDD As you grow in TDD mastery, you'll discover how to keep a massive C++ system from becoming a design mess over time, as well as particular C++ trouble spots to avoid. You'll find out how to prevent your tests from being a maintenance burden and how to think in TDD without giving up your hard-won C++ skills. Finally, you'll see how to grow and sustain TDD in your team. Whether you're a complete unit-testing novice or an experienced tester, this book will lead you to mastery of test-driven development in C++. What You Need A C++ compiler running under Windows or Linux, preferably one that supports C++11. Examples presented in the book were built under gcc 4.7.2. Google Mock 1.6 (downloadable for free; it contains Google Test as well) or an alternate C++ unit testing tool. Most examples in the book are written for Google Mock, but it isn't difficult to translate them to your tool of choice. A good programmer's editor or IDE. cmake, preferably. Of course, you can use your own preferred make too. CMakeLists.txt files are provided for each project. Examples provided were built using cmake version 2.8.9. Various freely-available third-party libraries are used as the basis for examples in the book. These include: cURL JsonCpp Boost (filesystem, date_time/gregorian, algorithm, assign) Several examples use the boost headers/libraries. Only one example uses cURL and JsonCpp.

Most people who write software have at least some experience with unit testing-even if they don't call it that. If you have ever written a few lines of throwaway code just to try something out, you've built a unit test. On the other end of the software spectrum, many large-scale

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applications have huge batteries of test cases that are repeatedly run and added to throughout the development process. What are unit test frameworks and how are they used? Simply stated, they are software tools to support writing and running unit tests, including a foundation on which to build tests and the functionality to execute the tests and report their results. They are not solely tools for testing; they can also be used as development tools on a par with preprocessors and debuggers. Unit test frameworks can contribute to almost every stage of software development and are key tools for doing Agile Development and building big-free code. Unit Test Frameworks covers the usage, philosophy, and architecture of unit test frameworks. Tutorials and example code are platform-independent and compatible with Windows, Mac OS X, Unix, and Linux. The companion CD includes complete versions of JUnit, CppUnit, NUnit, and XMLUnit, as well as the complete set of code examples.

With constantly changing business requirements and technical environments, the code needs to evolve too. Building applications using test-driven development process ensures that they work properly irrespective of such changes. In this book, you will learn to make such robust and production-ready applications with C# and .NET.

Summary Effective Unit Testing is written to show how to write good tests—tests that are concise and to the point, expressive, useful, and maintainable. Inspired by Roy Osherove's bestselling *The Art of Unit Testing*, this book focuses on tools and practices specific to the Java world. It introduces you to emerging techniques like behavior-driven development and specification by example, and shows you how to add robust practices into your toolkit. About Testing Test the components before you assemble them into a full application, and you'll get better software. For Java developers, there's now a decade of experience with well-crafted

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tests that anticipate problems, identify known and unknown dependencies in the code, and allow you to test components both in isolation and in the context of a full application. About this Book Effective Unit Testing teaches Java developers how to write unit tests that are concise, expressive, useful, and maintainable. Offering crisp explanations and easy-to-absorb examples, it introduces emerging techniques like behavior-driven development and specification by example. Programmers who are already unit testing will learn the current state of the art. Those who are new to the game will learn practices that will serve them well for the rest of their career. Purchase of the print book comes with an offer of a free PDF, ePub, and Kindle eBook from Manning. Also available is all code from the book. About the Author Lasse Koskela is a coach, trainer, consultant, and programmer. He hacks on open source projects, helps companies improve their productivity, and speaks frequently at conferences around the world. Lasse is the author of Test Driven, also published by Manning. What's Inside A thorough introduction to unit testing Choosing best-of-breed tools Writing tests using dynamic languages Efficient test automation Table of Contents PART 1 FOUNDATIONS The promise of good tests In search of good Test doubles PART 2 CATALOG Readability Maintainability Trustworthiness PART 3 DIVERSIONS Testable design Writing tests in other JVM languages Speeding up test execution

Radically improve your testing practice and software quality with new testing styles, good patterns, and reliable automation. Key Features A practical and results-driven approach to unit testing Refine your existing unit tests by implementing modern best practices Learn the four pillars of a good unit test Safely automate your testing process to save time and money Spot which tests need refactoring, and which need to be deleted entirely Purchase of the print book

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includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About The Book Great testing practices maximize your project quality and delivery speed by identifying bad code early in the development process. Wrong tests will break your code, multiply bugs, and increase time and costs. You owe it to yourself—and your projects—to learn how to do excellent unit testing. Unit Testing Principles, Patterns and Practices teaches you to design and write tests that target key areas of your code including the domain model. In this clearly written guide, you learn to develop professional-quality tests and test suites and integrate testing throughout the application life cycle. As you adopt a testing mindset, you'll be amazed at how better tests cause you to write better code. What You Will Learn Universal guidelines to assess any unit test Testing to identify and avoid anti-patterns Refactoring tests along with the production code Using integration tests to verify the whole system This Book Is Written For For readers who know the basics of unit testing. Examples are written in C# and can easily be applied to any language. About the Author Vladimir Khorikov is an author, blogger, and Microsoft MVP. He has mentored numerous teams on the ins and outs of unit testing. Table of Contents: PART 1 THE BIGGER PICTURE 1 | The goal of unit testing 2 | What is a unit test? 3 | The anatomy of a unit test PART 2 MAKING YOUR TESTS WORK FOR YOU 4 | The four pillars of a good unit test 5 | Mocks and test fragility 6 | Styles of unit testing 7 | Refactoring toward valuable unit tests PART 3 INTEGRATION TESTING 8 | Why integration testing? 9 | Mocking best practices 10 | Testing the database PART 4 UNIT TESTING ANTI-PATTERNS 11 | Unit testing anti-patterns

Write automated unit tests for the ABAP language. This book teaches programmers using simple examples and metaphors and explains the underlying concepts of writing effective

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automated unit tests. Many, if not most, ABAP programmers learned their programming and testing skills before the ABAP development environment provided an automated unit testing facility. *Automated Unit Testing with ABAP: A Practical Approach* offers hope and salvation to ABAP programmers who continue to toil with antiquated manual unit testing processes, taking them by the hand and lifting them out of that dungeon of despair with a modern and proven alternative. It begins by explaining how the xUnit family of automated testing frameworks provides a quick and effective means of insuring high-quality software. It then focuses on the ABAP Unit Testing Facility, the xUnit framework applicable specifically to the ABAP language, showing how it can be used to bring ABAP applications under automated testing control, from old legacy applications to those newly written. Whereas xUnit testing has been widely accepted with developers writing in many other programming languages, it is an unfortunate fact in the ABAP community that many programmers still are unfamiliar with xUnit concepts and do not know how to begin implementing automated unit testing into their development process. This book demonstrates how to refactor programs so they become designed for testability, showing how to use process encapsulation and test isolation to facilitate automated testing, including a thorough explanation of test-driven development and the use of test doubles. The book:

- Shows how to write automated unit tests for ABAP
- Instills ABAP programmers with the confidence to refactor poorly written code
- Explains how an automated testing harness facilitates rapid software development
- Teaches how to utilize test-driven development (TDD) with ABAP
- Offers advice and tips on the best ways to write automated unit tests

What You Will Learn

- Become familiar with the xUnit approach to testing
- Know the ABAP statements that interfere with running automated unit tests and how to accommodate them

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Understand what it means to isolate code for testing and how this is achieved Gain the confidence to refactor poorly written code Make ABAP programs designed for testability Reap the benefits of spending less time manually unit testing ABAP programs Use test-driven development (TDD) with ABAP programming Use configurable test doubles in ABAP Who This Book Is For ABAP programmers who remain unfamiliar with the automated unit testing facility and those who already use it but want to improve their skill writing and using automated tests. The book addresses the reluctance and trepidation felt by procedural ABAP programmers who need to know some object-oriented concepts to use this facility, expands their horizons, and helps them step through the doorway leading to a different approach to program design. Elixir offers new paradigms, and challenges you to test in unconventional ways. Start with ExUnit: almost everything you need to write tests covering all levels of detail, from unit to integration, but only if you know how to use it to the fullest - we'll show you how. Explore testing Elixir-specific challenges such as OTP-based modules, asynchronous code, Ecto-based applications, and Phoenix applications. Explore new tools like Mox for mocks and StreamData for property-based testing. Armed with this knowledge, you can create test suites that add value to your production cycle and guard you from regressions. Write Elixir tests that you can be proud of. Dive into Elixir's test philosophy and gain mastery over the terminology and concepts that underlie good tests. Create and structure a comprehensive ExUnit test suite, starting from the basics, and build comprehensive test coverage that will provide safety for refactoring and confidence that your code performs as designed. Use tests to make your software more reliable and fault tolerant. Explore the basic tool set provided by ExUnit and Mix to write and organize your test suite. Test code built around different OTP functionality. Isolate

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your code through dependency injection and by using Mox. Write comprehensive tests for Ecto projects, covering Ecto as a database tool as well as a standalone data validation tool. Test Phoenix channels from end to end, including authentication and joining topics. Write Phoenix controller tests and understand the concepts of integration testing in Elixir. Learn property-based testing with StreamData from the author who wrote the library. Code with high confidence that you are getting the most out of your test suite, with the right tools that make testing your code a pleasure and a valuable part of your development cycle. What You Need: To get the most out of this book, you will need to have installed Elixir 1.8 or later and Erlang/OTP 21 or later. In order to complete the relevant chapters, you will also need Ecto 3.1 or later, EctoSQL 3.1 or later and Phoenix 1.3 or later.

A practical, example-driven guide to using, automating, and integrating JavaScript Unit tests for the busy and conscientious JavaScript developer striving for excellence and success. JavaScript Unit Testing is a must have guide for every web developer, designer, architect, and JavaScript coder seeking to ensure the highest quality of their web applications and JS code. Knowledge of JavaScript is assumed.

Write clean code that works with the help of this groundbreaking software method. Example-driven teaching is the basis of Beck's step-by-step instruction that will have readers using TDD to further their projects.

Explore the new way of building and maintaining test cases with Java test driven development (TDD) using JUnit 5. This book doesn't just talk about the new concepts, it shows you ways of applying them in TDD and Java 8 to continuously deliver code that excels in all metrics. Unit testing and test driven development have now become part of every developer's skill set. For

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Java developers, the most popular testing tool has been JUnit, and JUnit 5 is built using the latest features of Java. With Java Unit Testing with JUnit 5, you'll master these new features, including method parameters, extensions, assertions and assumptions, and dynamic tests. You'll also see how to write clean tests with less code. This book is a departure from using older practices and presents new ways of performing tests, building assertions, and injecting dependencies. What You Will Learn Write tests the JUnit 5 way Run your tests from within your IDE Integrate tests with your build and static analysis tools Migrate from JUnit 4 to JUnit 5 Who This Book Is For Java developers both with and without any prior unit testing experience. When testing becomes a developer's habit good things tend to happen--good productivity, good code, and good job satisfaction. If you want some of that, there's no better way to start your testing habit, nor to continue feeding it, than with "" JUnit Recipes,"" In this book you will find one hundred and thirty-seven solutions to a range of problems, from simple to complex, selected for you by an experienced developer and master tester. Each recipe follows the same organization giving you the problem and its background before discussing your options in solving it. JUnit - the unit testing framework for Java - is simple to use, but some code can be tricky to test. When you're facing such code you will be glad to have this book. It is a how-to reference full of practical advice on all issues of testing, from how to name your test case classes to how to test complicated J2EE applications. Its valuable advice includes side matters that can have a big payoff, like how to organize your test data or how to manage expensive test resources. What's Inside: - Getting started with JUnit - Recipes for: servlets JSPs EJBs Database code much more - Difficult-to-test designs, and how to fix them - How testing saves time - Choose a JUnit extension: HTMLUnit XMLUnit ServletUnit EasyMock and more!

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Fundamental testing methodologies applied to the popular Python language Testing Python; Applying Unit Testing, TDD, BDD and Acceptance Testing is the most comprehensive book available on testing for one of the top software programming languages in the world. Python is a natural choice for new and experienced developers, and this hands-on resource is a much needed guide to enterprise-level testing development methodologies. The book will show you why Unit Testing and TDD can lead to cleaner, more flexible programs. Unit Testing and Test-Driven Development (TDD) are increasingly must-have skills for software developers, no matter what language they work in. In enterprise settings, it's critical for developers to ensure they always have working code, and that's what makes testing methodologies so attractive. This book will teach you the most widely used testing strategies and will introduce to you still others, covering performance testing, continuous testing, and more. Learn Unit Testing and TDD—important development methodologies that lie at the heart of Agile development Enhance your ability to work with Python to develop powerful, flexible applications with clean code Draw on the expertise of author David Sale, a leading UK developer and tech commentator Get ahead of the crowd by mastering the underappreciated world of Python testing Knowledge of software testing in Python could set you apart from Python developers using outmoded methodologies. Python is a natural fit for TDD and Testing Python is a must-read text for anyone who wants to develop expertise in Python programming.

The Hitchhiker's Guide to Python takes the journeyman Pythonista to true expertise. More than any other language, Python was created with the philosophy of simplicity and parsimony. Now 25 years old, Python has become the primary or secondary

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language (after SQL) for many business users. With popularity comes diversity—and possibly dilution. This guide, collaboratively written by over a hundred members of the Python community, describes best practices currently used by package and application developers. Unlike other books for this audience, *The Hitchhiker's Guide* is light on reusable code and heavier on design philosophy, directing the reader to excellent sources that already exist.

This book details Jay Fields' strong opinions on the best way to test, while acknowledging alternative styles and various contexts in which tests are written. Whether you prefer Jay Fields' style or not, this book will help you write better Unit Tests. From the Preface: Over a dozen years ago I read *Refactoring* for the first time; it immediately became my bible. While *Refactoring* isn't about testing, it explicitly states: If you want to refactor, the essential precondition is having solid tests. At that time, if *Refactoring* deemed it necessary, I unquestionably complied. That was the beginning of my quest to create productive unit tests. Throughout the 12+ years that followed reading *Refactoring* I made many mistakes, learned countless lessons, and developed a set of guidelines that I believe make unit testing a productive use of programmer time. This book provides a single place to examine those mistakes, pass on the lessons learned, and provide direction for those that want to test in a way that I've found to be the most productive. The book does touch on some theory and definition, but the main purpose is to show you how to take tests that are causing you pain and turn them into

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tests that you're happy to work with.

The Pragmatic Programmers classic is back! Freshly updated for modern software development, *Pragmatic Unit Testing in Java 8 With JUnit* teaches you how to write and run easily maintained unit tests in JUnit with confidence. You'll learn mnemonics to help you know what tests to write, how to remember all the boundary conditions, and what the qualities of a good test are. You'll see how unit tests can pay off by allowing you to keep your system code clean, and you'll learn how to handle the stuff that seems too tough to test. *Pragmatic Unit Testing in Java 8 With JUnit* steps you through all the important unit testing topics. If you've never written a unit test, you'll see screen shots from Eclipse, IntelliJ IDEA, and NetBeans that will help you get past the hard part--getting set up and started. Once past the basics, you'll learn why you want to write unit tests and how to effectively use JUnit. But the meaty part of the book is its collected unit testing wisdom from people who've been there, done that on production systems for at least 15 years: veteran author and developer Jeff Langr, building on the wisdom of Pragmatic Programmers Andy Hunt and Dave Thomas. You'll learn: How to craft your unit tests to minimize your effort in maintaining them. How to use unit tests to help keep your system clean. How to test the tough stuff. Memorable mnemonics to help you remember what's important when writing unit tests. How to help your team reap and sustain the benefits of unit testing. You won't just learn about unit testing in theory--you'll work through numerous code examples. When it comes to programming,

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hands-on is the only way to learn!

In test driven development, you first write an executable test of what your application code must do. Only then do you write the code itself and, with the test spurring you on, you improve your design. In acceptance test driven development (ATDD), you use the same technique to implement product features, benefiting from iterative development, rapid feedback cycles, and better-defined requirements. TDD and its supporting tools and techniques lead to better software faster. Test Driven brings under one cover practical TDD techniques distilled from several years of community experience. With examples in Java and the Java EE environment, it explores both the techniques and the mindset of TDD and ATDD. It uses carefully chosen examples to illustrate TDD tools and design patterns, not in the abstract but concretely in the context of the technologies you face at work. It is accessible to TDD beginners, and it offers effective and less well-known techniques to older TDD hands. Purchase of the print book comes with an offer of a free PDF, ePub, and Kindle eBook from Manning. Also available is all code from the book. What's Inside Learn hands-on to test drive Java code How to avoid common TDD adoption pitfalls Acceptance test driven development and the Fit framework How to test Java EE components-Servlets, JSPs, and Spring Controllers Tough issues like multithreaded programs and data access code As iOS apps become increasingly complex and business-critical, iOS developers must ensure consistently superior code quality. This means adopting best practices for

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creating and testing iOS apps. Test-Driven Development (TDD) is one of the most powerful of these best practices. Test-Driven iOS Development is the first book 100% focused on helping you successfully implement TDD and unit testing in an iOS environment. Long-time iOS/Mac developer Graham Lee helps you rapidly integrate TDD into your existing processes using Apple's Xcode 4 and the OCUit unit testing framework. He guides you through constructing an entire Objective-C iOS app in a test-driven manner, from initial specification to functional product. Lee also introduces powerful patterns for applying TDD in iOS development, and previews powerful automated testing capabilities that will soon arrive on the iOS platform. Coverage includes Understanding the purpose, benefits, and costs of unit testing in iOS environments Mastering the principles of TDD, and applying them in areas from app design to refactoring Writing usable, readable, and repeatable iOS unit tests Using OCUit to set up your Xcode project for TDD Using domain analysis to identify the classes and interactions your app needs, and designing it accordingly Considering third-party tools for iOS unit testing Building networking code in a test-driven manner Automating testing of view controller code that interacts with users Designing to interfaces, not implementations Testing concurrent code that typically runs in the background Applying TDD to existing apps Preparing for Behavior Driven Development (BDD) The only iOS-specific guide to TDD and unit testing, Test-Driven iOS Development covers both essential concepts and practical implementation.

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Effective Unit Testing A guide for Java developers Simon and Schuster

"The definitive guide, not just for JUnit, but unit testing in general."---Tyson S. Maxwell, Raytheon --

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, 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.

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The revolutionary guide that challenged businesses around the world to stop selling to their buyers and start answering their questions to get results; revised and updated to address new technology, trends, the continuous evolution of the digital consumer, and much more In today's digital age, the traditional sales funnel—marketing at the top, sales in the middle, customer service at the bottom—is no longer effective. To be successful, businesses must obsess over the questions, concerns, and problems their buyers have, and address them as honestly and as thoroughly as possible. Every day, buyers turn to search engines to ask billions of questions. Having the answers they need can attract thousands of potential buyers to your company—but only if your content strategy puts your answers at the top of those search results. It's a simple and powerful equation that produces growth and success: They Ask, You Answer. Using these principles, author Marcus Sheridan led his struggling pool company from the bleak depths of the housing crash of 2008 to become one of the largest pool installers in the United States. Discover how his proven strategy can work for your business and master the principles of inbound and content marketing that have empowered thousands of companies to achieve exceptional growth. They Ask, You Answer is a straightforward guide filled with practical tactics and insights for transforming your marketing strategy. This new edition has been fully revised and updated to reflect the evolution of content marketing and the increasing demands of today's internet-savvy buyers. New chapters explore the impact of technology, conversational marketing, the

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essential elements every business website should possess, the rise of video, and new stories from companies that have achieved remarkable results with They Ask, You Answer. Upon reading this book, you will know: How to build trust with buyers through content and video. How to turn your web presence into a magnet for qualified buyers. What works and what doesn't through new case studies, featuring real-world results from companies that have embraced these principles. Why you need to think of your business as a media company, instead of relying on more traditional (and ineffective) ways of advertising and marketing. How to achieve buy-in at your company and truly embrace a culture of content and video. How to transform your current customer base into loyal brand advocates for your company. They Ask, You Answer is a must-have resource for companies that want a fresh approach to marketing and sales that is proven to generate more traffic, leads, and sales.

Quickly learn how to automate unit testing of Python 3 code with Python 3 automation libraries, such as doctest, unittest, nose, nose2, and pytest. This book explores the important concepts in software testing and their implementation in Python 3 and shows you how to automate, organize, and execute unit tests for this language. This knowledge is often acquired by reading source code, manuals, and posting questions on community forums, which tends to be a slow and painful process. Python Unit Test Automation will allow you to quickly ramp up your understanding of unit test libraries for Python 3 through the practical use of code examples and exercises. All of which makes

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this book a great resource for software developers and testers who want to get started with unit test automation in Python 3 and compare the differences with Python 2. This short work is your must-have quick start guide to mastering the essential concepts of software testing in Python. What You'll Learn: Essential concepts in software testing Various test automation libraries for Python, such as doctest, unittest, nose, nose2, and pytest Test-driven development and best practices for test automation in Python Code examples and exercises Who This Book Is For: Python developers, software testers, open source enthusiasts, and contributors to the Python community

Summary Java Testing with Spock teaches you how to use Spock for a wide range of testing use cases in Java. Readers new to Groovy will appreciate the succinct language tutorial that'll give you just enough Groovy to use Spock effectively. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Spock combines the features of tools like JUnit, Mockito, and JBehave into a single powerful Java testing library. With Spock, you use Groovy to write more readable and concise tests. Spock enables seamless integration testing, and with the intuitive Geb library, you can even handle functional testing of web applications. About the Book Java Testing with Spock teaches you how to use Spock for a wide range of testing use cases in Java. You'll start with a quick overview of Spock and work through writing unit tests using the Groovy language. You'll discover best practices for test design as you learn to write mocks, implement integration tests,

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use Spock's built-in BDD testing tools, and do functional web testing using Geb. Readers new to Groovy will appreciate the succinct language tutorial in chapter 2 that gives you just enough Groovy to use Spock effectively. What's Inside Testing with Spock from the ground up Write mocks without an external library BDD tests your business analyst can read Just enough Groovy to use Spock About the Reader Written for Java developers. Knowledge of Groovy and JUnit is helpful but not required. About the Author Konstantinos Kapelonis is a software engineer who works with Java daily. Table of Contents PART 1 FOUNDATIONS AND BRIEF TOUR OF SPOCK Introducing the Spock testing framework Groovy knowledge for Spock testing A tour of Spock functionality PART 2 STRUCTURING SPOCK TESTS Writing unit tests with Spock Parameterized tests Mocking and stubbing PART 3 SPOCK IN THE ENTERPRISE Integration and functional testing with Spock Spock features for enterprise testing Effective Software Testing explores fifty critically important best practices, pitfalls, and solutions. Gleaned from the author's extensive practical experience, these concrete items will enable quality assurance professionals and test managers to immediately enhance their understanding and skills, avoid costly mistakes, and implement a state-of-the-art testing program. This book places special emphasis on the integration of testing into all phases of the software development life cycle--from requirements definition to design and final coding. The fifty lessons provided here focus on the key aspects of software testing: test planning, design, documentation, execution, managing the testing

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team, unit testing, automated testing, nonfunctional testing, and more. You will learn to:

- Base testing efforts on a prioritized feature schedule
- Estimate test preparation and execution
- Define the testing team roles and responsibilities
- Design test procedures as soon as requirements are available
- Derive effective test cases from requirements
- Avoid constraints and detailed data elements in test procedures
- Make unit-test execution part of the build process
- Use logging to increase system testability
- Test automated test tools on an application prototype
- Automate regression tests whenever possible
- Avoid sole reliance on capture/playback
- Conduct performance testing with production-sized databases
- Tailor usability tests to the intended audience
- Isolate the test environment from the development environment
- Implement a defect tracking life cycle

Throughout the book, numerous real-world case studies and concrete examples illustrate the successful application of these important principles and techniques. Effective Software Testing provides ready access to the expertise and advice of one of the world's foremost software quality and testing authorities. 0201794292B12032002

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

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

One skill that's essential for any professional JavaScript developer is the ability to write testable code. This book shows you what writing and maintaining testable JavaScript

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for the client- or server-side actually entails, whether you're creating a new application or rewriting legacy code. From methods to reduce code complexity to unit testing, code coverage, debugging, and automation, you'll learn a holistic approach for writing JavaScript code that you and your colleagues can easily fix and maintain going forward. Testing JavaScript code is complicated. This book helps experienced JavaScript developers simplify the process considerably. Get an overview of Agile, test-driven development, and behavior-driven development Use patterns from static languages and standards-based JavaScript to reduce code complexity Learn the advantages of event-based architectures, including modularity, loose coupling, and reusability Explore tools for writing and running unit tests at the functional and application level Generate code coverage to measure the scope and effectiveness of your tests Conduct integration, performance, and load testing, using Selenium or CasperJS Use tools for in-browser, Node.js, mobile, and production debugging Understand what, when, and how to automate your development processes

"Our tests are broken again!" "Why does the suite take so long to run?" "What value are we getting from these tests anyway?" Solve your testing problems by building and maintaining quality software with RSpec - the popular BDD-flavored Ruby testing framework. This definitive guide from RSpec's lead developer shows you how to use RSpec to drive more maintainable designs, specify and document expected behavior, and prevent regressions during refactoring. Build a project using RSpec to design,

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describe, and test the behavior of your code. Whether you're new to automated tests or have been using them for years, this book will help you write more effective tests. RSpec has been downloaded more than 100 million times and has inspired countless test frameworks in other languages. Use this influential Ruby testing framework to iteratively develop a project with the confidence that comes from well-tested code. This book guides you through creating a Ruby project with RSpec, and explores the individual components in detail. Start by learning the basics of installing and using RSpec. Then build a real-world JSON API, using RSpec throughout the process to drive a BDD-style outside-in workflow. Apply an effective test strategy to write fast, robust tests that support evolutionary design through refactoring. The rest of the book provides the definitive guide to RSpec's components. Use `rspec-core`'s metadata to slice and dice your spec suite. Dig into `rspec-expectations`' matchers: compose them in flexible ways, specify expected outcomes with precision, and diagnose problems quickly with the help of good failure messages. Write fast, isolated tests with `rspec-mocks`' test doubles while pushing your code toward simpler interfaces. The authors, with a combined 20 years of automated testing experience, share testing wisdom that will lead to a fun, productive testing experience. What You Need: To follow along with the book, you'll need Ruby 2.2+. The book will guide you through installing RSpec 3 and setting up a new project to use it.

Most developers would agree that writing automated tests is a good idea, but writing

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good, well-structured tests is still an elusive skill for many. For Java and Groovy developers, however, there's good news. This practical guide shows you how to write concise and highly readable tests with Spock, the most innovative testing and specification framework for the JVM since JUnit. Author Rob Fletcher takes you from Spock basics to advanced topics, using fully worked integration examples. Through the course of this book, you'll build a simple web application—Squawker—that allows users to post short messages. You'll discover how much easier it is to write automated tests with Spock's straightforward and expressive language. Start by learning how to write simple unit tests Understand the lifecycle of Spock specifications and feature methods Dive into interaction testing, using Spock's intuitive syntax for dealing with mocks and stubs Learn about parameterized tests—writing feature methods that run for multiple sets of data Move into advanced topics, such as writing idiomatic Spock code and driving parameterized tests with file or database input Learn how everything works together in a standalone, fully-worked, test-driven development example Master high quality software development driven by unit tests About This Book Design and implement robust system components by means of the de facto unit testing standard in Java Reduce defect rate and maintenance effort, plus simultaneously increase code quality and development pace Follow a step-by-step tutorial imparting the essential techniques based on real-world scenarios and code walkthroughs Who This Book Is For No matter what your specific background as a Java developer, whether you're simply interested in building up a safety net to reduce regressions of your desktop application or in improving your server-side

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reliability based on robust and reusable components, unit testing is the way to go. This book provides you with a comprehensive but concise entrance advancing your knowledge step-wise to a professional level. What You Will Learn Organize your test infrastructure and resources reasonably Understand and write well structured tests Decompose your requirements into small and independently testable units Increase your testing efficiency with on-the-fly generated stand-in components and deal with the particularities of exceptional flow Employ runners to adjust to specific test demands Use rules to increase testing safety and reduce boilerplate Use third party supplements to improve the expressiveness of your verification statements In Detail JUnit has matured to become the most important tool when it comes to automated developer tests in Java. Supported by all IDEs and build systems, it empowers programmers to deliver software features reliably and efficiently. However, writing good unit tests is a skill that needs to be learned; otherwise it's all too easy to end up in gridlocked development due to messed up production and testing code. Acquiring the best practices for unit testing will help you to prevent such problems and lead your projects to success with respect to quality and costs. This book explains JUnit concepts and best practices applied to the test first approach, a foundation for high quality Java components delivered in time and budget. From the beginning you'll be guided continuously through a practically relevant example and pick up background knowledge and development techniques step by step. Starting with the basics of tests organization you'll soon comprehend the necessity of well structured tests and delve into the relationship of requirement decomposition and the many-faceted world of test double usage. In conjunction with third-party tools you'll be trained in writing your tests efficiently, adapt your test case environment to particular demands and

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increase the expressiveness of your verification statements. Finally, you'll experience continuous integration as the perfect complement to support short feedback cycles and quality related reports for your whole team. The tutorial gives a profound entry point in the essentials of unit testing with JUnit and prepares you for test-related daily work challenges. Style and approach This is an intelligible tutorial based on an ongoing and non-trivial development example. Profound introductions of concepts and techniques are provided stepwise as the programming challenges evolve. This allows you to reproduce and practice the individual skills thoroughly.

Summary The Art of Unit Testing, Second Edition guides you step by step from writing your first simple tests to developing robust test sets that are maintainable, readable, and trustworthy. You'll master the foundational ideas and quickly move to high-value subjects like mocks, stubs, and isolation, including frameworks such as Moq, FakeItEasy, and Typemock Isolator. You'll explore test patterns and organization, working with legacy code, and even "untestable" code. Along the way, you'll learn about integration testing and techniques and tools for testing databases and other technologies. About this Book You know you should be unit testing, so why aren't you doing it? If you're new to unit testing, if you find unit testing tedious, or if you're just not getting enough payoff for the effort you put into it, keep reading. The Art of Unit Testing, Second Edition guides you step by step from writing your first simple unit tests to building complete test sets that are maintainable, readable, and trustworthy. You'll move quickly to more complicated subjects like mocks and stubs, while learning to use isolation (mocking) frameworks like Moq, FakeItEasy, and Typemock Isolator. You'll explore test patterns and organization, refactor code applications, and learn how to test "untestable"

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code. Along the way, you'll learn about integration testing and techniques for testing with databases. The examples in the book use C#, but will benefit anyone using a statically typed language such as Java or C++. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. What's Inside Create readable, maintainable, trustworthy tests Fakes, stubs, mock objects, and isolation (mocking) frameworks Simple dependency injection techniques Refactoring legacy code About the Author Roy Osherove has been coding for over 15 years, and he consults and trains teams worldwide on the gentle art of unit testing and test-driven development. His blog is at ArtOfUnitTesting.com. Table of Contents PART 1 GETTING STARTED The basics of unit testing A first unit test PART 2 CORE TECHNIQUES Using stubs to break dependencies Interaction testing using mock objects Isolation (mocking) frameworks Digging deeper into isolation frameworks PART 3 THE TEST CODE Test hierarchies and organization The pillars of good unit tests PART 4 DESIGN AND PROCESS Integrating unit testing into the organization Working with legacy code Design and testability

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 unique 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

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part is a detailed tutorial on test automation that covers everything from test strategy to in-depth test coding. The second part, 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.

How do you write truly elegant code with Ruby? Ruby Best Practices is for programmers who want to use Ruby as experienced Rubyists do. Written by the developer of the Ruby project Prawn, this concise book explains how to design beautiful APIs and domain-specific languages with Ruby, as well as how to work with functional programming ideas and techniques that can simplify your code and make you more productive. You'll learn how to write code that's readable, expressive, and much more. Ruby Best Practices will help you: Understand the secret powers unlocked by Ruby's code blocks Learn how to bend Ruby code without breaking it, such as mixing in modules on the fly Discover the ins and outs of testing and debugging, and how to design for testability Learn to write faster code by keeping things simple Develop strategies for text processing and file management, including regular expressions Understand how and why things can go wrong Reduce cultural barriers by leveraging Ruby's multilingual capabilities This book also offers you comprehensive chapters on driving code through tests, designing APIs, and project maintenance. Learn how to make the most of this rich, beautiful language with Ruby Best Practices.

Unit Testing Principles, Patterns and Practices shows you how to refine your existing unit tests by implementing modern best practices. You'll learn to spot which tests are performing, which

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need refactoring, and which need to be deleted entirely! Upgrade your testing suite with new testing styles, good patterns, and reliable automated testing. Unit Testing Principles, Practices and Patterns is a practical guide to modern unit testing best practices. Microsoft MVP Vladimir Khorikov takes you hands-on with examples of the ideal unit test and unit testing practices, building your skills step by step on a solid foundation. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications.

Rely on this robust and thorough guide to build and maintain successful test automation. As the software industry shifts from traditional waterfall paradigms into more agile ones, test automation becomes a highly important tool that allows your development teams to deliver software at an ever-increasing pace without compromising quality. Even though it may seem trivial to automate the repetitive tester's work, using test automation efficiently and properly is not trivial. Many test automation endeavors end up in the "graveyard" of software projects. There are many things that affect the value of test automation, and also its costs. This book aims to cover all of these aspects in great detail so you can make decisions to create the best test automation solution that will not only help your test automation project to succeed, but also allow the entire software project to thrive. One of the most important details that affects the success of the test automation is how easy it is to maintain the automated tests. Complete Guide to Test Automation provides a detailed hands-on guide for writing highly maintainable test code. What You'll Learn Know the real value to be expected from test automation Discover the key traits that will make your test automation project succeed Be aware of the different considerations to take into account when planning automated tests vs. manual tests Determine who should implement the tests and the implications of this decision Architect the

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test project and fit it to the architecture of the tested application Design and implement highly reliable automated tests Begin gaining value from test automation earlier Integrate test automation into the business processes of the development team Leverage test automation to improve your organization's performance and quality, even without formal authority Understand how different types of automated tests will fit into your testing strategy, including unit testing, load and performance testing, visual testing, and more Who This Book Is For Those involved with software development such as test automation leads, QA managers, test automation developers, and development managers. Some parts of the book assume hands-on experience in writing code in an object-oriented language (mainly C# or Java), although most of the content is also relevant for nonprogrammers.

Do less work when testing your Python code, but be just as expressive, just as elegant, and just as readable. The pytest testing framework helps you write tests quickly and keep them readable and maintainable - with no boilerplate code. Using a robust yet simple fixture model, it's just as easy to write small tests with pytest as it is to scale up to complex functional testing for applications, packages, and libraries. This book shows you how. For Python-based projects, pytest is the undeniable choice to test your code if you're looking for a full-featured, API-independent, flexible, and extensible testing framework. With a full-bodied fixture model that is unmatched in any other tool, the pytest framework gives you powerful features such as assert rewriting and plug-in capability - with no boilerplate code. With simple step-by-step instructions and sample code, this book gets you up to speed quickly on this easy-to-learn and robust tool. Write short, maintainable tests that elegantly express what you're testing. Add powerful testing features and still speed up test times by distributing tests across multiple

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processors and running tests in parallel. Use the built-in assert statements to reduce false test failures by separating setup and test failures. Test error conditions and corner cases with expected exception testing, and use one test to run many test cases with parameterized testing. Extend pytest with plugins, connect it to continuous integration systems, and use it in tandem with tox, mock, coverage, unittest, and doctest. Write simple, maintainable tests that elegantly express what you're testing and why. What You Need: The examples in this book are written using Python 3.6 and pytest 3.0. However, pytest 3.0 supports Python 2.6, 2.7, and Python 3.3-3.6.

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