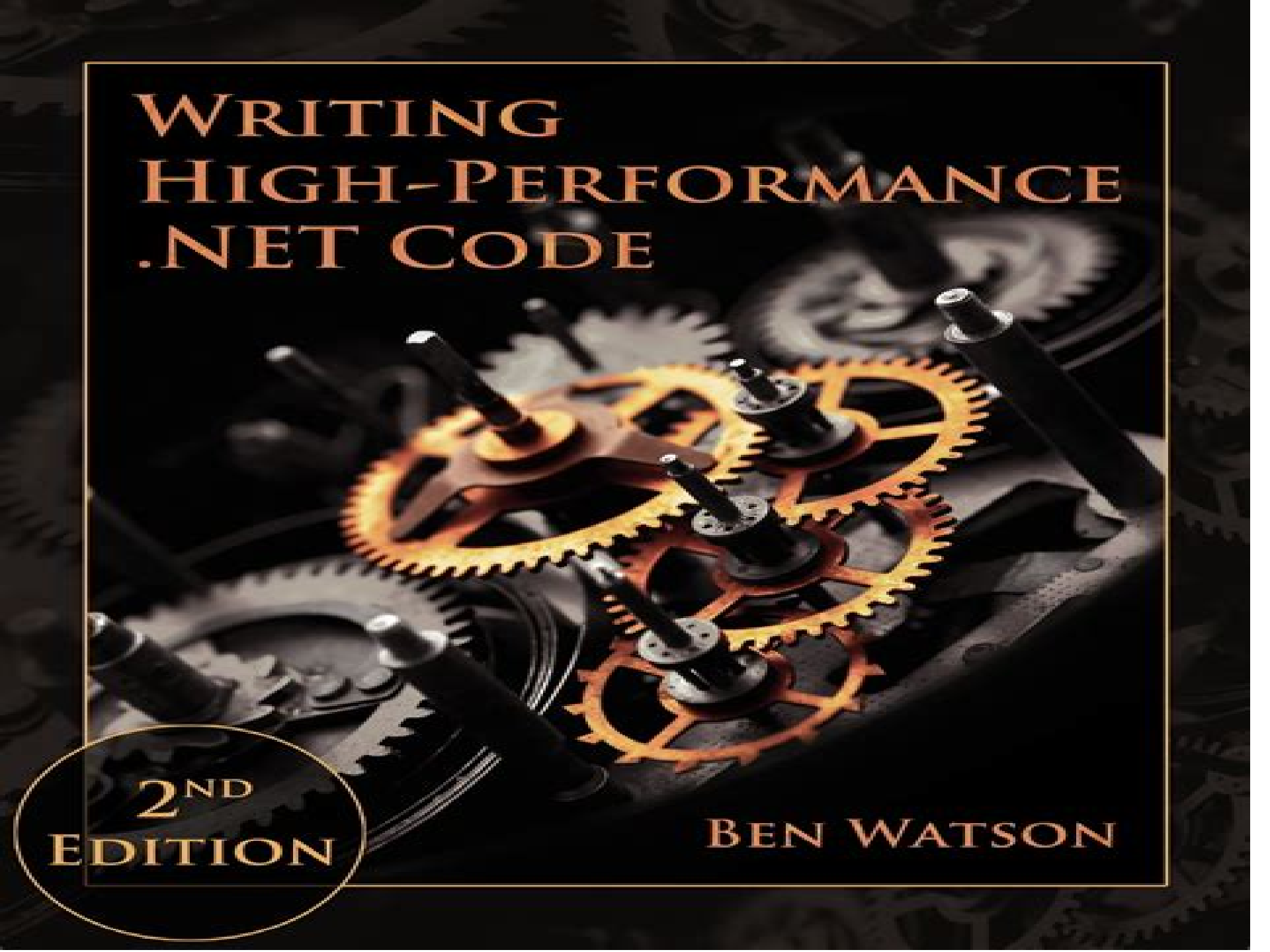




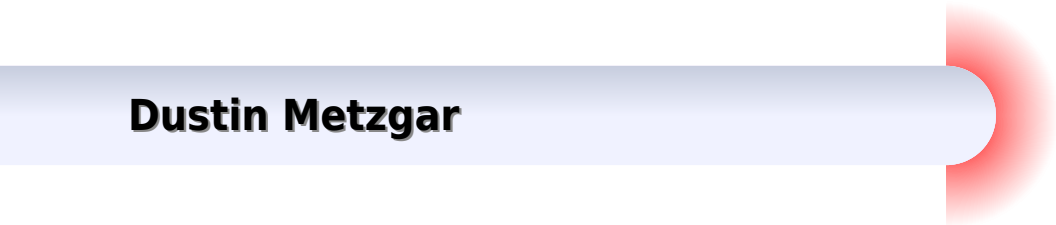
WRITING HIGH-PERFORMANCE .NET CODE

2ND
EDITION

BEN WATSON

Writing High Performance Net Code

Dustin Metzgar



Writing High Performance Net Code:

Writing High-Performance .NET Code, 2nd Edition Ben Watson, 2018-04-16 Take performance to the next level This book does not just teach you how the CLR works it teaches you exactly what you need to do now to obtain the best performance today It will expertly guide you through the nuts and bolts of extreme performance optimization in NET complete with in depth examinations of CLR functionality free tool recommendations and tutorials useful anecdotes and step by step guides to measure and improve performance This second edition incorporates the advances and improvements in NET over the last few years as well as greatly expanded coverage of tools more topics more tutorials more tips and improvements throughout the entire book New in the 2nd Edition 50% increase in content New examples code samples and diagrams throughout entire book More ways to analyze the heap and find memory problems More tool coverage including expanded usage of Visual Studio More benchmarking New GC configuration options Code warmup techniques New NET features such as ref returns value tuples SIMD and more More detailed analysis of LINQ Tips for high level feature areas such as ASP NET ADO NET and WPF Also find expanded coverage and discover new tips and tricks for Profiling with multiple tools to quickly find problem areas Detailed description of the garbage collector how to optimize your code for it and how to diagnose difficult memory related issues How to analyze JIT and diagnose warmup problems Effective use of the Task Parallel Library to maximize throughput Which NET features and APIs to use and which to avoid Instrument your program with performance counters and ETW events Use the latest and greatest NET features Build a performance minded team and so much more [Writing High-Performance .Net Code](#) Ben Watson, 2018-04-16 Take performance to the next level This book

does not just teach you how the CLR works it teaches you exactly what you need to do now to obtain the best performance today It will expertly guide you through the nuts and bolts of extreme performance optimization in NET complete with in depth examinations of CLR functionality free tool recommendations and tutorials useful anecdotes and step by step guides to measure and improve performance This second edition incorporates the advances and improvements in NET over the last few years as well as greatly expanded coverage of tools more topics more tutorials more tips and improvements throughout the entire book New in the 2nd Edition 50% increase in content New examples code samples and diagrams throughout entire book More ways to analyze the heap and find memory problems More tool coverage including expanded usage of Visual Studio More benchmarking New GC configuration options Code warmup techniques New NET features such as ref returns value tuples SIMD and more More detailed analysis of LINQ Tips for high level feature areas such as ASP NET ADO NET and WPF Also find expanded coverage and discover new tips and tricks for Profiling with multiple tools to quickly find problem areas Detailed description of the garbage collector how to optimize your code for it and how to diagnose difficult memory related issues How to analyze JIT and diagnose warmup problems Effective use of the Task Parallel Library to maximize throughput Which NET features and APIs to use and which to avoid Instrument your program with performance counters and

ETW events Use the latest and greatest NET features Build a performance minded team and so much more **Writing High-Performance .NET Code** Ben Watson,2014 Do you want your NET code to have the absolute best performance it can This book demystifies the CLR teaching you how and why to write code with optimum performance Learn critical lessons from a person who helped design and build one of the largest high performance NET systems in the world This book does not just teach you how the CLR works it teaches you exactly what you need to do now to obtain the best performance today It will expertly guide you through the nuts and bolts of extreme performance optimization in NET complete with in depth examinations of CLR functionality free tool recommendations and tutorials useful anecdotes and step by step guides to measure and improve performance Among the topics you will learn are how to Choose what to measure and why Use many amazing tools freely available to solve problems quickly Understand the NET garbage collector and its effect on your application Use effective coding patterns that lead to optimal garbage collection performance Diagnose common GC related issues Reduce costs of JITting Use multiple threads sanely and effectively avoiding synchronization problems Know which NET features and APIs to use and which to avoid Use code generation to avoid performance problems Measure everything and expose hidden performance issues Instrument your program with performance counters and ETW events Use the latest and greatest NET features Ensure your code can run on mobile devices without problems Build a performance minded team and much more **High-Performance Programming in C# and .NET** Jason Alls,2022-07-29 Enhance your applications performance using best practices for benchmarking application profiling asynchronous programming designing responsive UIs gRPC communication and distributed applications Key Features Make the best use of performance enhancements in C 10 0 and NET 6 Boost application performance by identifying hardware bottlenecks and common performance pitfalls Get to grips with best practices and techniques for improving the scalability of distributed systems Book Description Writing high performance code while building an application is crucial and over the years Microsoft has focused on delivering various performance related improvements within the NET ecosystem This book will help you understand the aspects involved in designing responsive resilient and high performance applications with the new version of C and NET You will start by understanding the foundation of high performance code and the latest performance related improvements in C 10 0 and NET 6 Next you ll learn how to use tracing and diagnostics to track down performance issues and the cause of memory leaks The chapters that follow then show you how to enhance the performance of your networked applications and various ways to improve directory tasks file tasks and more Later you ll go on to improve data querying performance and write responsive user interfaces You ll also discover how you can use cloud providers such as Microsoft Azure to build scalable distributed solutions Finally you ll explore various ways to process code synchronously asynchronously and in parallel to reduce the time it takes to process a series of tasks By the end of this C programming book you ll have the confidence you need to build highly resilient high performance applications that meet your customer s demands What you will learn Use correct types and

collections to enhance application performance Profile benchmark and identify performance issues with the codebase Explore how to best perform queries on LINQ to improve an application s performance Effectively utilize a number of CPUs and cores through asynchronous programming Build responsive user interfaces with WinForms WPF MAUI and WinUI Benchmark ADO NET Entity Framework Core and Dapper for data access Implement CQRS and event sourcing and build and deploy microservices Who this book is for This book is for software engineers professional software developers performance engineers and application profilers looking to improve the speed of their code or take their skills to the next level to gain a competitive advantage You should be a proficient C programmer who can already put the language to good use and is also comfortable using Microsoft Visual Studio 2022 **Pro .NET Memory Management** Konrad Kokosa,2018-11-12

Understand NET memory management internal workings pitfalls and techniques in order to effectively avoid a wide range of performance and scalability problems in your software Despite automatic memory management in NET there are many advantages to be found in understanding how NET memory works and how you can best write software that interacts with it efficiently and effectively Pro NET Memory Management is your comprehensive guide to writing better software by understanding and working with memory management in NET Thoroughly vetted by the NET Team at Microsoft this book contains 25 valuable troubleshooting scenarios designed to help diagnose challenging memory problems Readers will also benefit from a multitude of NET memory management rules to live by that introduce methods for writing memory aware code and the means for avoiding common destructive pitfalls What You ll Learn Understand the theoretical underpinnings of automatic memory management Take a deep dive into every aspect of NET memory management including detailed coverage of garbage collection GC implementation that would otherwise take years of experience to acquire Get practical advice on how this knowledge can be applied in real world software development Use practical knowledge of tools related to NET memory management to diagnose various memory related issues Explore various aspects of advanced memory management including use of Span and Memory types Who This Book Is For NET developers solution architects and performance engineers **C# 7 and .NET Core 2.0 High Performance** Ovais Mehboob Ahmed Khan,2018-04-25 Improve the speed of your code and optimize the performance of your apps Key Features Understand the common performance pitfalls and improve your application s performance Get to grips with multi threaded and asynchronous programming in C Develop highly performant applications on NET Core using microservice architecture Book Description While writing an application performance is paramount Performance tuning for realworld applications often involves activities geared toward finding bottlenecks however this cannot solve the dreaded problem of slower code If you want to improve the speed of your code and optimize an application s performance then this book is for you C 7 and NET Core 2 0 High Performance begins with an introduction to the new features of what explaining how they help in improving an application s performance Learn to identify the bottlenecks in writing programs and highlight common performance pitfalls and learn strategies to detect and

resolve these issues early You will explore multithreading and asynchronous programming with NET Core and learn the importance and efficient use of data structures This is followed with memory management techniques and design guidelines to increase an application s performance Gradually the book will show you the importance of microservices architecture for building highly performant applications and implementing resiliency and security in NET Core After reading this book you will learn how to structure and build scalable optimized and robust applications in C# 7 and NET What you will learn Measure application performance using BenchmarkDotNet Explore the techniques to write multithreaded applications Leverage TPL and PLinq libraries to perform asynchronous operations Get familiar with data structures to write optimized code Understand design techniques to increase your application s performance Learn about memory management techniques in NET Core Develop a containerized application based on microservices architecture Learn tools and techniques to monitor application performance Who this book is for This book is for NET developers looking at improving the speed of their code or simply wanting to take their skills to the next level Basic C# knowledge is assumed **.NET Core in Action** Dustin

Metzgar,2018-07-12 Summary NET Core in Action shows NET developers how to build professional software applications with NET Core Learn how to convert existing NET code to work on multiple platforms or how to start new projects with knowledge of the tools and capabilities of NET Core Purchase of the print book includes a free eBook in PDF Kindle and ePub formats from Manning Publications About the Technology NET Core is an open source framework that lets you write and run NET applications on Linux and Mac without giving up on Windows Built for everything from lightweight web apps to industrial strength distributed systems it s perfect for deploying NET servers to any cloud platform including AWS and GCP About the Book NET Core in Action introduces you to cross platform development with NET Core This hands on guide concentrates on new Core features as you walk through familiar tasks like testing logging data access and networking As you go you ll explore modern architectures like microservices and cloud data storage along with practical matters like performance profiling localization and signing assemblies What s Inside Choosing the right tools Testing profiling and debugging Interacting with web services Converting existing projects to NET Core Creating and using NuGet packages About the Reader All examples are in C# About the Author Dustin Metzgar is a seasoned developer and architect involved in numerous NET Core projects Dustin works for Microsoft Table of Contents Why NET Core Building your first NET Core applications How to build with NET Core Unit testing with xUnit Working with relational databases Simplify data access with object relational mappers Creating a microservice Debugging Performance and profiling Building world ready applications Multiple frameworks and runtimes Preparing for release appendix A Frameworks and runtimes appendix B xUnit command line options appendix C What s in the NET Standard Library appendix D NuGet cache locations **Expert .NET 1.1**

Programming Simon Robinson,2004-09-27 This is a book about getting the best out of NET It s based on the philosophy that the best approach to writing good high performance robust applications that take full advantage of the features of NET is to

understand what's going on deep under the hood. If you are already experienced with writing managed applications and want to learn more about how to get the best from the CLR at an advanced level, then this is the book for you. Topics covered include intermediate language, performance profiling, security, advanced Windows Forms, threading, and systems management using Windows Management Instrumentation (WMI). This book has been reviewed by developers at Microsoft who have provided invaluable information about the CLR. The information contained in this book, which in many cases goes far beyond the available documentation, will enable you to write better, more robust, more responsive, better performing, and in some cases more sophisticated applications. **Expert .NET Programming** originally appeared under the title **Advanced .NET**. The response from many readers was extremely enthusiastic, prompting us to release a second edition under the new title. This edition has been fully updated for .NET 1.1, and many of the explanations have been revised. **Learning .NET**

High-performance Programming Antonio Esposito, 2015-06-30. This book will help you understand what programming for performance means and use effective coding patterns and techniques to optimize your .NET applications. You will begin by understanding what high performance coding means and the different performance concerns. You will see how CLR works and get an understanding of concepts such as memory management, garbage collection, and thread life cycles. You will proceed to learn about the theoretical and practical concepts of PLINQ programming. You will also see what Big Data is and how to architect a Big Data solution to manipulate large datasets. Finally, you will learn how to launch and analyze a profile session and execute tests against a code block or application for performance analysis. By the end of this book, you will have a complete understanding of efficient programming using high performance techniques and will be able to write highly optimized applications. **ASP.NET Core 2 High Performance** James Singleton, 2017-10-11. Learn how to develop web applications that deploy cross platform and are optimized for high performance using ASP.NET Core 2. About This Book: Master high level web app performance improvement techniques using ASP.NET Core 2.0. Find the right balance between premature optimization and inefficient code. Design workflows that run asynchronously and are resilient to transient performance issues. Who This Book Is For: This book is aimed for readers who can build a web application and have some experience with ASP.NET or some other web application framework such as Ruby on Rails or Django. They can be people who are happy learning details independently but who struggle to discover the topics that they should be researching. The reader should be interested in improving the performance of their web app and in learning about ASP.NET Core and modern C#. What You Will Learn: Understand ASP.NET Core 2 and how it differs from its predecessor. Address performance issues at the early stages of development. Set up development environments on Windows, Mac, and Linux. Measure profile and find the most significant problems. Identify the differences between development workstations and production infrastructures and how these can exacerbate problems. Boost the performance of your application but with an eye to how it affects complexity and maintenance. Explore a few cutting edge techniques such as advanced hashing and custom transports. In Detail: The ASP.NET Core 2

framework is used to develop high performance and cross platform web applications It is built on NET Core 2 and includes significantly more framework APIs than version 1 This book addresses high level performance improvement techniques It starts by showing you how to locate and measure problems and then shows you how to solve some of the most common ones Next it shows you how to get started with ASP NET Core 2 on Windows Mac Linux and with Docker containers The book illustrates what problems can occur as latency increases when deploying to a cloud infrastructure It also shows you how to optimize C code and choose the best data structures for the job It covers new features in C 6 and 7 along with parallel programming and distributed architectures By the end of this book you will be fixing latency issues and optimizing performance problems but you will also know how this affects the complexity and maintenance of your application Finally we will explore a few highly advanced techniques for further optimization

Style and approach A step by step practical guide filled with real world use cases and examples

Pro .NET Performance Sasha Goldshtein,Dima Zurbalev,SELA Group,Ido Flatow,2012-10-22 Maximizing the performance of your algorithms and applications is extremely important and can give you a competitive advantage a lower cost of ownership and happier users Pro NET Performance explains the internals of Windows the CLR and the physical hardware that affect the performance of your applications and gives you the knowledge and tools to measure how your code performs in isolation from external factors The book is full of C code samples and tips to help you squeeze every bit of juice from your application lower memory utilization consistent CPU usage and fewer I O operations across the network and disk Pro NET Performance will change the way you think about NET application development Guides you through performance measurement with a variety of profilers and other tools Explains how OS and CLR internals affect your application s performance in unexpected ways Provides you with tips and real life case studies for improving application performance

Guidance for .NET Systems Development: Development, Architecture and Maintainability Tuomas Hietanen,2025-06-13 Guidance for Microsoft NET systems development This short but dense book contains some opinionated guidance on Microsoft NET software engineering topics focused mainly on development architecture and maintainability

ASP.NET Core in Action, Third Edition Andrew Lock,2023-11-14 Build professional grade full stack web applications using C and ASP NET Core In ASP NET Core in Action Third Edition you ll learn how to Build minimal APIs for serving JSON to client side applications Create dynamic server side rendered applications using Razor Pages User authentication and authorization Store data using Entity Framework Core Unit and integration tests for ASP NET Core applications Write custom middleware and components Fully updated to ASP NET Core 7 0 In ASP NET Core in Action Third Edition Microsoft MVP Andrew Lock teaches you how you can use your C and NET skills to build amazing cross platform web applications This revised bestseller reveals the latest NET patterns including minimal APIs and minimal hosting Even if you ve never worked with ASP NET you ll start creating productive cross platform web apps fast Illustrations and annotated code make learning visual and easy About the technology The ASP NET Core web framework delivers everything

you need to build professional quality web applications With productivity boosting libraries for server side rendering secure APIs easy data access and more you ll spend your time implementing features instead of researching syntax and tracking down bugs This book is your guide About the book ASP NET Core in Action Third Edition shows you how to create production grade web applications with ASP NET Core 7 0 You ll learn from hands on examples insightful illustrations and nicely explained code Updated coverage in this Third Edition includes creating minimal APIs securing APIs with bearer tokens WebApplicationBuilder and more About the reader For beginning to intermediate web developers Examples are in C About the author Andrew Lock is a Microsoft MVP who has worked with ASP NET Core since before its first release Table of Contents 1 Getting started with ASP NET Core 2 Understanding ASP NET Core 3 Your first application 4 Handling requests with the middleware pipeline 5 Creating a JSON API with minimal APIs 6 Mapping URLs to endpoints using routing 7 Model binding and validation in minimal APIs 8 An introduction to dependency injection 9 Registering services with dependency injection 10 Configuring an ASP NET Core application 11 Documenting APIs with OpenAPI 12 Saving data with Entity Framework Core 13 Creating a website with Razor Pages 14 Mapping URLs to Razor Pages using routing 15 Generating responses with page handlers in Razor Pages 16 Binding and validating requests with Razor Pages 17 Rendering HTML using Razor views 18 Building forms with Tag Helpers 19 Creating a website with MVC controllers 20 Creating an HTTP API using web API controllers 21 The MVC and Razor Pages filter pipeline 22 Creating custom MVC and Razor Page filters 23 Authentication Adding users to your application with Identity 24 Authorization Securing your application 25 Authentication and authorization for APIs 26 Monitoring and troubleshooting errors with logging 27 Publishing and deploying your application 28 Adding HTTPS to an application 29 Improving your application s security 30 Building ASP NET Core apps with the generic host and Startup 31 Advanced configuration of ASP NET Core 32 Building custom MVC and Razor Pages components 33 Calling remote APIs with HttpClientFactory 34 Building background tasks and services 35 Testing applications with xUnit 36 Testing ASP NET Core applications

ASP.NET Core 1.0 High Performance James Singleton, 2016-06-27 Create fast scalable and high performance applications with C ASP NET Core 1 0 and MVC 6 About This Book Learn the importance of measuring profiling and locating the most impactful problems Discover the common areas you might encounter performance problems and areas you don t need to worry about Understand the differences between development workstations and production infrastructure and how these can amplify problems Design workflows that run asynchronously and are resilient to transient performance issues Who This Book Is For This book is for ASP NET and C developers who have experience with the MVC framework for web application development and are looking to deploy applications that will perform well in live production environments These could be virtual machines or hosted by a cloud service provider such as AWS or Azure What You Will Learn Why performance matters and when it should be considered Use different tools to measure performance Spot common performance issues their root causes and how to easily mitigate them

Improve performance at the network level and I O level and how to optimize the application as a whole Work with caching and message queuing tools including patterns and strategies Discover the dark side of performance improvement and find out how to manage complexity Monitor performance as part of continuous integration and regression testing Assess and solve performance issues with other advanced technologies In Detail ASP NET Core is the new open source and cross platform web application framework from Microsoft It s a stripped down version of ASP NET that s lightweight and fast This book will show you how to make your web apps deliver high performance when using it We ll address many performance improvement techniques from both a general web standpoint and from a C ASP NET Core and NET Core perspective This includes delving into the latest frameworks and demonstrating software design patterns that improve performance We will highlight common performance pitfalls which can often occur unnoticed on developer workstations along with strategies to detect and resolve these issues early By understanding and addressing challenges upfront you can avoid nasty surprises when it comes to deployment time We will introduce performance improvements along with the trade offs that they entail We will strike a balance between premature optimization and inefficient code by taking a scientific and evidence based approach We ll remain pragmatic by focusing on the big problems By reading this book you ll learn what problems can occur when web applications are deployed at scale and know how to avoid or mitigate these issues You ll gain experience of how to write high performance applications without having to learn about issues the hard way You ll see what s new in ASP NET Core why it s been rebuilt from the ground up and what this means for performance You will understand how you can now develop on and deploy to Windows Mac OS X and Linux using cross platform tools such as Visual Studio Code Style and approach Starting with a drill down into the nuts and bolts of various performance parameters you will get an understanding of the ASP NET MVC 6 framework with the help of rich code based examples that will equip you to build highly scalable and optimized applications

Essential C# 6.0 Mark Michaelis, Eric Lippert, 2015-09-19 Welcome to one of the greatest collaborations you could dream of in the world of C books and probably far beyond From the Foreword by Mads Torgersen C Program Manager Microsoft Essential C 6 0 is a well organized no fluff guide to the latest versions of C for programmers at all levels of experience Fully updated to reflect new C 6 0 and NET 4 6 features and patterns it will help you write C code that s simple powerful robust secure and maintainable This book s authors are world class C experts long time Microsoft MVP and Regional Director Mark Michaelis and Eric Lippert formerly principal developer on Microsoft s C compiler team Together they cover the entire language illustrating key constructs with succinct examples and offering a complete foundation for successful C development Essential C 6 0 makes it easy to program with any version of C whether you re creating new code or maintaining existing systems Separate indexes for C versions 4 5 and 6 help you quickly find version specific answers with accompanying visual indicators that help you identify which language innovations will work when This edition also includes a set of best practice C Coding Guidelines updated to leverage C 6 0 constructs Coverage includes Mastering C data types

operators control flow methods and parameters Using C object oriented constructs including classes inheritance interfaces and more all with the significantly simplified syntax of C 6 0 Working with well formed value and reference types Implementing reliable effective exception handling Reducing code complexity with generics delegates lambda expressions and events including a simplified C 6 0 syntax for triggering events Learning dynamic programming with reflection and attributes Querying diverse data collections using LINQ with query expressions Creating custom collections that operate against business objects Using collection interfaces and standard query operators to access NET collections Understanding the Common Language Infrastructure and C in the context of NET 4 6 Taking advantage of declarative programming embedded metadata reflection and attributes Mastering multithreading and synchronization including the new async await paradigm Using P Invoke pointers and direct memory manipulation to interoperate with other languages Understanding how C programs relate to the underlying runtime For Qualified Instructors An instructor s guide exercises and a slide deck are available to support your courses [InfoWorld](#) ,2001-09-17 InfoWorld is targeted to Senior IT professionals Content is segmented into Channels and Topic Centers InfoWorld also celebrates people companies and projects **Building Automated Trading Systems** Benjamin Van Vliet,2007-03-07 Over the next few years the proprietary trading and hedge fund industries will migrate largely to automated trade selection and execution systems Indeed this is already happening While several finance books provide C code for pricing derivatives and performing numerical calculations none approaches the topic from a system design perspective This book will be divided into two sections programming techniques and automated trading system ATS technology and teach financial system design and development from the absolute ground up using Microsoft Visual C NET 2005 MS Visual C NET 2005 has been chosen as the implementation language primarily because most trading firms and large banks have developed and continue to develop their proprietary algorithms in ISO C and Visual C NET provides the greatest flexibility for incorporating these legacy algorithms into working systems Furthermore the NET Framework and development environment provide the best libraries and tools for rapid development of trading systems The first section of the book explains Visual C NET 2005 in detail and focuses on the required programming knowledge for automated trading system development including object oriented design delegates and events enumerations random number generation timing and timer objects and data management with STL NET and NET collections Furthermore since most legacy code and modeling code in the financial markets is done in ISO C this book looks in depth at several advanced topics relating to managed unmanaged COM memory management and interoperability Further this book provides dozens of examples illustrating the use of database connectivity with ADO NET and an extensive treatment of SQL and FIX and XML FIXML Advanced programming topics such as threading sockets as well as using C NET to connect to Excel are also discussed at length and supported by examples The second section of the book explains technological concerns and design concepts for automated trading systems Specifically chapters are devoted to handling real time data feeds managing

orders in the exchange order book position selection and risk management A dll is included in the book that will emulate connection to a widely used industry API Trading Technologies Inc s XTAPI and provide ways to test position and order management algorithms Design patterns are presented for market taking systems based upon technical analysis as well as for market making systems using intermarket spreads As all of the chapters revolve around computer programming for financial engineering and trading system development this book will educate traders financial engineers quantitative analysts students of quantitative finance and even experienced programmers on technological issues that revolve around development of financial applications in a Microsoft environment and the construction and implementation of real time trading systems and tools Teaches financial system design and development from the ground up using Microsoft Visual C NET 2005 Provides dozens of examples illustrating the programming approaches in the book Chapters are supported by screenshots equations sample Excel spreadsheets and programming code *InfoWorld* ,2001-09-24 InfoWorld is targeted to Senior IT professionals Content is segmented into Channels and Topic Centers InfoWorld also celebrates people companies and projects **Windows Azure and ASP.NET MVC Migration** Benjamin Perkins,2013-07-02 Practical real world tools for migrating ASP NET MVC to Windows Azure When IIS6 and Windows Server 2003 are no longer supported you ll need to migrate websites currently hosted on these technologies to newer technologies This book comes to the rescue It s packed with all the steps you need all intertwined with real world examples to perform the migration of IIS6 and Windows Server 2003 websites to Windows Azure Discusses different aspects of performance and scalability such as pipeline optimization process model configuration caching minification and bundling Shares an overview of the Windows Azure Cloud Service and the benefits it has over legacy configurations Looks at Windows Azure deployment features provides steps for getting access to Windows Azure and explains how to create the components necessary to host and successfully run a test website Windows Azure and ASP NET MVC Migration is a must have resource for making the transition to Windows Azure as smooth and successful as possible **Maximizing .NET Performance** Nick Wienholt,2008-01-01 Foreword by NET Remoting guru Ingo Rammer BACK IN 1999 the ACM published a study that presented a comparison of 40 independent implementations of a computationally intensive problem created by different programmers in either Java the then current managed runtime environment or C C It concluded with the finding that interpersonal differences between the developers are much larger than the average difference between Java and C C and that performance ratios of a factor of 30 or more are not uncommon between the median programs from the upper half versus the lower half This should teach you something If you are not a guru level C programmer then the chance is quite high that a managed code implementation performs as well as the average C solution especially given the fact that most NET languages simply allow you fewer possibilities to introduce subtle memory related or performance related issues And keep in mind that this study was conducted several years ago and that Just In Time Compilation JIT as well as memory management and garbage collection GC technologies have been improved in the

meantime This however doesn't mean that you can't create horribly slow memory eating applications with .NET That's why you should be really concerned about the other part of the study's conclusion namely that interpersonal differences are much larger In essence this means that you have to know about how to optimize your applications so that they run with the expected performance in a managed environment Even though .NET frees you from a lot of tasks that in C would have been your responsibility as a developer these tasks still exist these little puppets have only cleared the main stage and now live in some little corner behind the scenes If you want your application to run in the top performance range you will still need to find the right strings to pull to move these hidden figures and to basically keep them out of the way of negatively affecting your application's performance Lutz Prechtelt Comparing Java vs C C Efficiency Differences to Interpersonal Differences Communications of the ACM 42 no 10 October 1999 109 112 But knowing about the common language runtime's internals is still not enough as lots of performance issues actually turn up during application design and not just during the coding stage Collections remoting interoperability with unmanaged code and COM components are not the only things that come to my mind in this regard It is the aim of Nick's book to enable you to understand the design issues as well as the underlying CLR mechanisms in order to create the programs that run on the better side of the 30 times performance difference quoted in the ACM study Nick really managed to create a book that addresses these issues which will otherwise turn up when carelessly coding to a managed environment This book will allow you to get into the details without being overwhelmed by the underlying complexity of the common language runtime The only thing you have to resist after reading the book is the urge to over optimize your code I was delighted to see that Nick begins with a discussion of identifying an application's performance critical sections and only later turns towards isolating and resolving these real performance bottlenecks This is in my opinion one of the most important tasks and also one of the most complex ones when working with large scale applications And now read on and enjoy the ride to the better side of a 30 fold performance difference Ingo Rammer author of Advanced .NET Remoting Vienna Austria <http://www.ingorammer.com> About the Book Maximizing .NET Performance is the first book dedicated entirely to providing developers and architects with information on .NET Framework performance .NET is a technology with a vast surface area and coverage of every aspect of performance relevant to all .NET technologies is not possible within a single volume This book concentrates on the performance of .NET Framework technologies like garbage collection .NET Remoting and Code Access Security Because these technologies form the building blocks upon which all .NET applications run the information in this book is relevant to all .NET developers In addition to providing high level material on achieving software with good performance characteristics the book aims to enhance your knowledge of the design and implementation of the framework and to provide the tools and techniques to allow you to conduct your own investigation into performance problems Rather than taking a tips and tricks approach the book aims to provide a detailed exploration of each topic and explore the why and by how much aspects of performance that are often overlooked

Whispering the Strategies of Language: An Mental Journey through **Writing High Performance Net Code**

In a digitally-driven earth where monitors reign supreme and immediate transmission drowns out the subtleties of language, the profound secrets and mental subtleties hidden within words often move unheard. However, set within the pages of **Writing High Performance Net Code** a captivating fictional value pulsating with fresh feelings, lies an extraordinary quest waiting to be undertaken. Composed by an experienced wordsmith, that charming opus invites viewers on an introspective journey, softly unraveling the veiled truths and profound affect resonating within the cloth of every word. Within the emotional depths of the poignant review, we will embark upon a genuine exploration of the book is primary themes, dissect its fascinating writing fashion, and fail to the effective resonance it evokes serious within the recesses of readers hearts.

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Writing High Performance Net Code Introduction

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