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Understanding Java Virtual
Machine Sachin Seth
Books

*Understanding
Java Virtual
Machine Sachin
Seth*

A manual on the Java 1.2 virtual machine. This new edition contains a new chapter providing a tutorial on using native methods with the JNI (Java Native Interface) specification. The CD-ROM contains source code examples from the book, interactive illustrations, Java Development Kit, and a resources Web site.

Understanding Java provides a thorough introduction to the Java

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programming language and also imparts an understanding of the way things are in Java. The overall aims of Understanding Java by Barry Cornelius are to introduce the main aspects of programming, to explain the constructs available in the Java programming language and to create an appropriate foundation for the construction of large programs.

Barry Cornelius has taught courses in Java at the University of Durham since 1996. This book is based on material taught by the author to students that are new to programming.

Virtual machines have been critical software systems for decades and now platforms such as Apple iOS,

Google Android, and Microsoft Windows Phone all need them as primary application execution engines. This book provides a systematic description that combines high-level design and low-level implementations and integrates advanced academic topics and commercial solutions for industry. It presents two drastically different practical virtual machine designs and implementations: one as an introductory courseware and the other as a high-performance software product with source code. In this text, Smith and Nair take a new approach by examining virtual machines as a unified discipline and pulling together cross-cutting

technologies. Topics include instruction set emulation, dynamic program translation and optimization, high level virtual machines (including Java and CLI), and system virtual machines for both single-user systems and servers.

Optimizing Java

Programming Scala

Crafting Interpreters

Distributed, Embedded and Real-time Java Systems

Inside the Java Virtual Machine

Despite using them every day, most software engineers know little about how programming languages are designed and implemented. For many, their

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only experience with that corner of computer science was a terrifying "compilers" class that they suffered through in undergrad and tried to blot from their memory as soon as they had scribbled their last NFA to DFA conversion on the final exam. That fearsome reputation belies a field that is rich with useful techniques and not so difficult as some of its practitioners might have you believe. A better understanding of how programming languages are built will make you a stronger software engineer and teach you concepts and data structures you'll use the rest of

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your coding days. You might even have fun. This book teaches you everything you need to know to implement a full-featured, efficient scripting language. You'll learn both high-level concepts around parsing and semantics and gritty details like bytecode representation and garbage collection. Your brain will light up with new ideas, and your hands will get dirty and calloused. Starting from `main()`, you will build a language that features rich syntax, dynamic typing, garbage collection, lexical scope, first-class functions, closures, classes, and inheritance. All packed into a

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few thousand lines of clean, fast code that you thoroughly understand because you wrote each one yourself.

Understand the internals and architecture of GraalVM with the help of hands-on experiments and gain deep knowledge that you can apply to improve your application's performance, interoperability, and throughput.

Key Features

- Generate faster and leaner code with minimum computing resources for high performance
- Compile Java applications faster than ever to a standalone executable called native images
- Create high-performance polyglot

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applications that are compatible across various JVM and non-JVM languages

Book Description

GraalVM is a universal virtual machine that allows programmers to compile and run applications written in both JVM and non-JVM languages. It improves the performance and efficiency of applications, making it an ideal companion for cloud-native or microservices-based applications. This book is a hands-on guide, with step-by-step instructions on how to work with GraalVM. Starting with a quick introduction to the GraalVM architecture and how things work under the hood,

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you'll discover the performance benefits of running your Java applications on GraalVM. You'll then learn how to create native images and understand how AOT (ahead-of-time) can improve application performance significantly. The book covers examples of building polyglot applications that will help you explore the interoperability between languages running on the same VM. You'll also see how you can use the Truffle framework to implement any language of your choice to run optimally on GraalVM. By the end of this book, you'll not only have

learned how GraalVM is beneficial in cloud-native and microservices development but also how to leverage its capabilities to create high-performing polyglot applications. What you will learn Gain a solid understanding of GraalVM and how it works under the hood Work with GraalVM's high performance optimizing compiler and see how it can be used in both JIT (just-in-time) and AOT (ahead-of-time) modes Get to grips with the various optimizations that GraalVM performs at runtime Use advanced tools to analyze and diagnose

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performance issues in the codeCompile, embed, run, and interoperate between languages using Truffle on GraalVMBuild optimum microservices using popular frameworks such as Micronaut and Quarkus to create cloud-native applicationsWho this book is for This book is for JVM developers looking to optimize their application's performance. You'll also find this book useful if you're a JVM developer looking to explore options to develop polyglot applications using tools from the Python, R, Ruby, or Node.js ecosystem. A solid understanding of software

development concepts and prior experience working with programming languages is necessary to get started.

The Java Virtual Machine (JVM) is the underlying technology behind Java's most distinctive features including size, security and cross-platform delivery. This guide shows programmers how to write programs for the Java Virtual Machine.

Understanding Java Virtual
Machine Alpha Science
International Limited

Tackle Multicore Complexity on
the JVM

Java and the Java Virtual
Machine

Practical Techniques for Improving JVM Application Performance

Java Performance: The Definitive Guide

Introduction to Programming

Describes how to use
Scala to create
applications for the
Java VM.

Along with the
increasingly important
runtime engines
pervasive in our daily-
life computing, there is
a strong demand from the
software community for a
solid presentation on
the design and

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implementation of modern virtual machines, including the Java virtual machine, JavaScript engine and Android execution engine. The community expects to see not only formal algorithm description, but also pragmatic code snippets; to understand not only research topics, but also engineering solutions. This book meets these demands by providing a unique description that combines high level

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design with low level implementations and academic advanced topics with commercial solutions. This book takes a holistic approach to the design of VM architecture, with contents organized into a consistent framework, introducing topics and algorithms in an easily understood step by step process. It focuses on the critical aspects of VM design, which are often overlooked in other works, such as runtime helpers, stack

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unwinding and native interface. The algorithms are fully illustrated in figures and implemented in easy to digest code snippets, making the abstract concepts tangible and programmable for system software developers. This IBM® Redbooks® publication provides information about the new Java virtual machine (JVM) server technology in IBM CICS® Transaction Server for z/OS® V4.2. We begin by outlining the many advantages of

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its multi-threaded operation over the pooled JVM function of earlier releases. The Open Services Gateway initiative (OSGi) is described and we highlight the benefits OSGi brings to both development and deployment. Details are then provided about how to configure and use the new JVM server environment. Examples are included of the deployment process, which takes a Java application from the

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workstation Eclipse integrated development environment (IDE) with the IBM CICS Explorer® software development kit (SDK) plug-in, through the various stages up to execution in a stand-alone CICS region and an IBM CICSplex® environment. The book continues with a comparison between traditional CICS programming, and CICS programming from Java. As a result, the main functional areas of the Java class library for

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CICS (JCICS) application programming interface (API) are extensively reviewed. Further chapters are provided to demonstrate interaction with structured data such as copybooks, and how to access relational databases by using Java Database Connectivity (JDBC) and Structured Query Language for Java (SQLJ). Finally, we devote a chapter to the migration of applications from the pooled JVM model to the new JVM server run time.

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Have you ever thought about learning how to make your computer do what you want it to do? Do you want to learn to program but just don't know where to start?

Have all other learning resources got you confused with over explanations, rather than walking you in the right direction? Don't worry, you have to look no further. Written by not just an ...

Scalability = Functional
Programming + Objects
Java 8 Pocket Guide

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Definition,

Verification, Validation

Core Java for Beginners,
3rd Edition

Scala is a modern programming language for the Java Virtual Machine (JVM) that combines the best features of object-oriented and functional programming languages. Using Scala, you can write programs more concisely than in Java, as well as leverage the full power of concurrency. Since Scala runs on the JVM, it can access any Java library and

is interoperable with Java frameworks. Scala for the Impatient concisely shows developers what Scala can do and how to do it. In this book, Cay Horstmann, the principal author of the international best-selling Core Java™, offers a rapid, code-based introduction that's completely practical. Horstmann introduces Scala concepts and techniques in "blog-sized" chunks that you can quickly master and apply. Hands-on activities guide you through well-defined stages of competency, from basic to

expert. Coverage includes
Getting started quickly with
Scala's interpreter, syntax,
tools, and unique idioms
Mastering core language
features: functions, arrays,
maps, tuples, packages,
imports, exception handling,
and more **Becoming familiar**
with object-oriented
programming in Scala:
classes, inheritance, and
traits **Using Scala for real-**
world programming tasks:
working with files, regular
expressions, and XML
Working with higher-order
functions and the powerful
Scala collections library

**Leveraging Scala's powerful pattern matching and case classes
Creating concurrent programs with Scala actors
Implementing domain-specific languages
Understanding the Scala type system
Applying advanced "power tools" such as annotations, implicits, and delimited continuations
Scala is rapidly reaching a tipping point that will reshape the experience of programming. This book will help object-oriented programmers build on their existing skills, allowing them to immediately construct**

useful applications as they gradually master advanced programming techniques. UNDERSTANDING JAVA VIRTUAL MACHINE helps readers in gaining in-depth knowledge of underlying Java virtual machine architecture. Chapters in this book are outcome of author's understanding, developed while coding Java Virtual Machine. Initial chapters give the background of platform dependency and how platform independence can be achieved. It explains the building blocks of the Java

Virtual Machine like heap, stacks and other storage areas. In subsequent chapters, it continues with algorithms that Java Virtual Machine performs. This book uses 'C' programming language for explaining the algorithms. Audience having background of 'C' or other language will have an advantage in understanding Java Virtual Machine algorithms. Final chapters help target audience in understanding the implementation of java native interface, multi-threading and garbage

collection in Java Virtual Machine.

Research on real-time Java technology has been prolific over the past decade, leading to a large number of corresponding hardware and software solutions, and frameworks for distributed and embedded real-time Java systems. This book is aimed primarily at researchers in real-time embedded systems, particularly those who wish to understand the current state of the art in using Java in this domain. Much of the work in real-time distributed, embedded and

real-time Java has focused on the Real-time Specification for Java (RTSJ) as the underlying base technology, and consequently many of the Chapters in this book address issues with, or solve problems using, this framework. Describes innovative techniques in: scheduling, memory management, quality of service and communication systems supporting real-time Java applications; Includes coverage of multiprocessor embedded systems and parallel programming;

Discusses state-of-the-art resource management for embedded systems, including Java's real-time garbage collection and parallel collectors; Considers hardware support for the execution of Java programs including how programs can interact with functional accelerators; Includes coverage of Safety Critical Java for development of safety critical embedded systems.

Discusses the origin and purpose of the Java language, platform independence, security,

network mobility, and related issues, and provides detailed information and advice for programmers

Instant Help for Java Programmers

Compiling with C# and Java Understanding Java Virtual Machine

Design Principles and Patterns

Java For Dummies

Performance tuning is an experimental science, but that doesn't mean engineers should resort to guesswork and folklore to get the job done. Yet that's often the case. With this practical book, intermediate to advanced Java technologists working with complex

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technology stacks will learn how to tune Java applications for performance using a quantitative, verifiable approach. Most resources on performance tend to discuss the theory and internals of Java virtual machines, but this book focuses on the practicalities of performance tuning by examining a wide range of aspects. There are no simple recipes, tips and tricks, or algorithms to learn. Performance tuning is a process of defining and determining desired outcomes. And it requires diligence. Learn how Java principles and technology make the best use of modern hardware and operating systems Explore several performance tests and common anti-patterns that can vex your team Understand the pitfalls of measuring Java

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performance numbers and the drawbacks of microbenchmarking Dive into JVM garbage collection logging, monitoring, tuning, and tools Explore JIT compilation and Java language performance techniques Learn performance aspects of the Java Collections API and get an overview of Java concurrency

Get up to speed on Scala, the JVM language that offers all the benefits of a modern object model, functional programming, and an advanced type system. Packed with code examples, this comprehensive book shows you how to be productive with the language and ecosystem right away, and explains why Scala is ideal for today's highly scalable, data-centric applications that support concurrency and

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distribution. This second edition covers recent language features, with new chapters on pattern matching, comprehensions, and advanced functional programming. You'll also learn about Scala's command-line tools, third-party tools, libraries, and language-aware plugins for editors and IDEs. This book is ideal for beginning and advanced Scala developers alike.

Program faster with Scala's succinct and flexible syntax Dive into basic and advanced functional programming (FP) techniques Build killer big-data apps, using Scala's functional combinators Use traits for mixin composition and pattern matching for data extraction Learn the sophisticated type system that combines FP and object-oriented programming concepts Explore

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Scala-specific concurrency tools, including Akka Understand how to develop rich domain-specific languages Learn good design techniques for building scalable and robust Scala applications Explore the Java Virtual Machine with modern programming languages About This Book This guide provides in-depth coverage of the Java Virtual Machine and its features Filled with practical examples, this book will help you understand the core concepts of Java, Scala, Clojure, Kotlin, and Groovy Work with various programming paradigms and gain knowledge about imperative, object-oriented and functional programming Who This Book Is For This book is meant for programmers who are interested in

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the Java Virtual Machine (JVM) and want to learn more about the most popular programming languages that can be used for JVM development. Basic practical knowledge of a modern programming language that supports object-oriented programming (JavaScript, Python, C#, VB.NET, and C++) is assumed. What You Will Learn Gain practical information about the Java Virtual Machine Understand the popular JVM languages and the Java Class Library Get to know about various programming paradigms such as imperative, object-oriented, and functional Work with common JVM tools such as Eclipse IDE, Gradle, and Maven Explore frameworks such as SparkJava, Vert.x, Akka and JavaFX Boost your knowledge

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about dialects of other well-known programming languages that run on the JVM, including JavaScript, Python, and Ruby In Detail Anyone who knows software development knows about the Java Virtual Machine. The Java Virtual Machine is responsible for interpreting Java byte code and translating it into actions. In the beginning, Java was the only programming language used for the JVM. But increasing complexity of the language and the remarkable performance of the JVM created an opening for a new generation of programming languages. If you want to build a strong foundation with the Java Virtual Machine and get started with popular modern programming languages, then this book is for you. The book will begin with a

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general introduction of the JVM and its features, which are common to the JVM languages, helping you get abreast with its concepts. It will then dive into explaining languages such as Java, Scala, Clojure, Kotlin, and Groovy and will show how to work with each language, their features, use cases, and pros and cons. By writing example projects in those languages and focusing on each language's strong points, it will help you find the programming language that is most appropriate for your particular needs. By the end of the book, you will have written multiple programs that run on the Java Virtual Machine and know about the differences between the various languages. Style and approach This practical, example-filled guide will help you get started

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with the JVM and some of its most popular languages.

Java, undoubtedly, has its roots in embedded systems and the Web. Nevertheless, it is a fully functional high-level programming language that can provide users with a wide range of functionality and versatility. This thoroughly cross-reviewed state-of-the-art survey is devoted to the study of the syntax and semantics of Java from a formal-methods point of view. It consists of the following chapters by leading researchers: Formal Grammar for Java; Describing the Semantics of Java and Proving Type Soundness; Proving Java Type Soundness; Machine-Checking the Java Specification: Proving Type-Safety; An Event-Based Structural Operational

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Semantics of Multi-Threaded Java
Dynamic Denotational Semantics of
Java; A Programmer's Reduction
Semantics for Classes and Mixins;
A Formal Specification of Java
Virtual Machine Instructions for
Objects, Methods and Subroutines;
The Operational Semantics of a
Java Secure Processor; A
Programmer Friendly Modular
Definition of the Semantics of Java.
Introduction to JVM Languages
Concurrent Programming in Java
The Java Virtual Machine
Specification, Java SE 7 Edition
Getting the Most Out of Your Code
STRUCTURED COMPUTER
ORGANIZATION

*This is an in-depth look at the
construction and underlying theory
of a fullyfunctional virtual machine*

and an entire suite of related development tools.

The origin of this book goes back to the Dagstuhl seminar on Logic for System Engineering, organized during the first week of March 1997 by S. Jiihnichen, J. Loeckx, and M. Wirsing. During that seminar, after Egon Borger's talk on How to Use Abstract State Machines in Software Engineering, Wolfram Schulte, at the time a research assistant at the University of Ulm, Germany, questioned whether ASMs provide anything special as a scientifically well founded and rigorous yet simple and industrially viable framework for high level design and analysis of complex systems, and for natural

refinements of models to executable code. Wolfram Schulte argued, referring to his work with K. Achatz on A Formal Object-Oriented Method Inspired by Fusion and Object-Z [1], that with current techniques of functional programming and of axiomatic specification, one can achieve the same result. An intensive and long debate arose from this discussion. At the end of the week, it led Egon Borger to propose a collaboration on a real-life specification project of Wolfram Schulte's choice, as a comparative field test of purely functional declarative methods and of their enhancement within an integrated abstract state-based operational (ASM) approach. After

*some hesitation, in May 1997
Wolfram Schulte accepted the offer
and chose as the theme a high-
level specification of Java and of
the Java Virtual Machine.*

*A compiler is a special program that
processes statements in a
particular programming language
and turns them into machine code
that the computer can understand.
Compiling with C# and Java is an
introduction to compiler
construction using the Java Virtual
Machine (JVM) and .NET Common
Language Routine (CLR), both of
which provide the interface
between compiler, C# or Java
code, and hardware. Loaded with
exercises, examples and case
studies, the text balances theory*

and practice to provide the reader with a solid working knowledge of the subject.

Written by the inventors of the technology, The Java® Virtual Machine Specification, Java SE 7 Edition, is the definitive technical reference for the Java Virtual Machine. The book provides complete, accurate, and detailed coverage of the Java Virtual Machine. It fully describes the invokedynamic instruction and method handle mechanism added in Java SE 7, and gives the formal Prolog specification of the type-checking verifier introduced in Java SE 6. The book also includes the class file extensions for generics and annotations defined in Java SE

5.0, and aligns the instruction set and initialization rules with the Java Memory Model.

Introduction to Compiler

Construction in a Java World

Virtual Machine Design and

Implementation in C/C++

Supercharge Your Applications with GraalVM

Programming for the Java Virtual Machine

IBM CICS and the JVM server:

Developing and Deploying Java Applications

Build fault-tolerant,

robust, and distributed

applications in Scala Key

Features - Understand and

use the concepts of reactive programming to build

distributed systems running

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on multiple nodes. - Learn how reactive architecture reduces complexity throughout the development process. - Get to grips with functional reactive programming and Reactive Microservices. Book Description Reactive programming is a scalable, fast way to build applications, and one that helps us write code that is concise, clear, and readable. It can be used for many purposes such as GUIs, robotics, music, and others, and is central to many concurrent systems. This book will be your guide to getting started with Reactive programming in

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Scala. You will begin with the fundamental concepts of Reactive programming and gradually move on to working with asynchronous data streams. You will then start building an application using Akka Actors and extend it using the Play framework. You will also learn about reactive stream specifications, event sourcing techniques, and different methods to integrate Akka Streams into the Play Framework. This book will also take you one step forward by showing you the advantages of the Lagom framework while working with reactive microservices. You will also learn to scale

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*applications using multi-
node clusters and test,
secure, and deploy your
microservices to the cloud.
By the end of the book, you
will have gained the
knowledge to build robust
and distributed systems with
Scala and Akka. What you
will learn Understand the
fundamental principles of
Reactive and Functional
programming Develop
applications utilizing
features of the Akka
framework Explore techniques
to integrate Scala, Akka,
and Play together Learn
about Reactive Streams with
real-time use cases Develop
Reactive Web Applications
with Play, Scala, Akka, and*

*Akka Streams Develop and
deploy Reactive
microservices using the
Lagom framework and ConductR
Who this book is for This
book is for Scala developers
who would like to build
fault-tolerant, scalable
distributed systems. No
knowledge of Reactive
programming is required.
Core Java for Beginners has
been written keeping in mind
the requirements of B.Tech
and MCA students. The book
introduces the core concepts
of Java, along with the
knowledge of fundamentals
required for developing
programs. Starting from the
basic concepts of object-
oriented programming*

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languages, the book covers an entire range of topics, including advanced topics like RMI, JDBC, and so on. The text is replete with several examples to facilitate better understanding of the intricacies of the programming language. **KEY FEATURES**

- Incorporates features of Java 2 and J2SE
- Discusses exception handling in depth
- Discusses garbage collection
- Introduces new pedagogical feature 'Remember', which recapitulates the key points discussed and also clarifies finer programming and conceptual points
- Presents around 350 tested programs

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with outputs and reinforces the learning through exercises

Coding and testing are often considered separate areas of expertise. In this comprehensive guide, author and Java expert Scott Oaks takes the approach that anyone who works with Java should be equally adept at understanding how code behaves in the JVM, as well as the tunings likely to help its performance. You'll gain in-depth knowledge of Java application performance, using the Java Virtual Machine (JVM) and the Java platform, including the language and API. Developers and performance

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engineers alike will learn a variety of features, tools, and processes for improving the way Java 7 and 8 applications perform. Apply four principles for obtaining the best results from performance testing Use JDK tools to collect data on how a Java application is performing Understand the advantages and disadvantages of using a JIT compiler Tune JVM garbage collectors to affect programs as little as possible Use techniques to manage heap memory and JVM native memory Maximize Java threading and synchronization performance features Tackle performance issues in Java EE and Java

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*SE APIs Improve Java-driven
database application
performance*

*Describes sections of the
Java language specification
(JLS) and the Java virtual
machine specification (JVMS)
that are of interest to
mainstream business
application programmers. The
author progresses through
literals, package
declarations, import
declarations, the static
modifier, all of the
primitive data types, the
object class, the string
class, iterators, and
utility methods for arrays
and other collections. c.
Book News Inc.*

Java Rules

Scala Reactive Programming
Virtual Machines
Versatile Platforms for
Systems and Processes
Understanding Java

Threads are a fundamental part of the Java platform. As multicore processors become the norm, using concurrency effectively becomes essential for building high-performance applications. Java SE 5 and 6 are a huge step forward for the development of concurrent applications, with improvements to the Java Virtual Machine to support high-performance, highly scalable concurrent classes and a rich

set of new concurrency building blocks. In *Java Concurrency in Practice*, the creators of these new facilities explain not only how they work and how to use them, but also the motivation and design patterns behind them. However, developing, testing, and debugging multithreaded programs can still be very difficult; it is all too easy to create concurrent programs that appear to work, but fail when it matters most: in production, under heavy load. *Java Concurrency in Practice* arms readers with both the theoretical underpinnings and concrete techniques for

building reliable, scalable, maintainable concurrent applications. Rather than simply offering an inventory of concurrency APIs and mechanisms, it provides design rules, patterns, and mental models that make it easier to build concurrent programs that are both correct and performant. This book covers:

- Basic concepts of concurrency and thread safety
- Techniques for building and composing thread-safe classes
- Using the concurrency building blocks in `java.util.concurrent`
- Performance optimization dos and don'ts
- Testing concurrent

programs Advanced topics such as atomic variables, nonblocking algorithms, and the Java Memory Model Start building powerful programs with Java 6—fast! Get an overview of Java 6 and begin building your own programs Even if you're new to Java programming—or to programming in general—you can get up and running on this wildly popular language in a hurry. This book makes it easy! From how to install and run Java to understanding classes and objects and juggling values with arrays and collections, you will get up to speed on the new

features of Java 6 in no time.
Discover how to Use object-oriented programming Work with the changes in Java 6 and JDK 6 Save time by reusing code Mix Java and Javascript with the new scripting tools Troubleshoot code problems and fix bugs All on the bonus CD-ROM Custom build of JCreator and all the code files used in the book Bonus chapters not included in the book Trial version of Jindent, WinOne, and NetCaptor freeware System Requirements: For details and complete system requirements, see the CD-ROM appendix. Note: CD-

ROM/DVD and other supplementary materials are not included as part of eBook file.

The ONLY complete, up-to-date guide to all aspects of Java performance • •The first one-stop guide to identifying, isolating, and fixing Java performance issues on multicore and multiprocessor processor platforms - from two of Sun's leading Java performance experts. •Includes crucial new insights into microbenchmarking found nowhere else. •Contains up-to-the-minute coverage of Java optimization, including

migration of older applications. Given Java's ubiquity and indispensability, Java software performance is of crucial importance to millions of developers worldwide. The emergence of multi-core systems and the evolution of the Java platform give developers many new opportunities to optimize performance. Now, three of Sun's leading Java performance experts have written the first start-to-finish guide to optimizing Java performance in today's multi-core systems. Java Performance gives developers, designers, and architects all the

information they need to leverage Java's performance and scalability abilities on any modern multicore or multiprocessor system. This book's end-to-end coverage addresses all these topics: monitoring and profiling; the effective use of garbage collection and other language features; adaptive and platform-specific tuning; techniques for maximizing scalability; and much more. The authors' extensive benchmarking coverage includes an indispensable introduction to effective microbenchmarks - including guidance on avoiding

the common microbenchmarking mistakes that mislead developers into writing badlyperforming software. The book also contains a complete section on Java performance enhancement, including opportunities and challenges associated with migrating software from Java 1.4.2 and Java 5 - issues that more and more Java developers are now facing.

When you need quick answers for developing or debugging Java programs, this pocket guide provides a handy reference to standard features

of the Java programming language and its platform. You'll find helpful programming examples, tables, figures, and lists, as well as Java 8 features such as Lambda Expressions and the Date and Time API. It's an ideal companion, whether you're in the office, in the lab, or on the road. This book also provides material to help you prepare for the Oracle Certified Associate Java Programmer exam. Quickly find Java language details, such as naming conventions, types, statements and blocks, and object-oriented programming. Get details on the Java SE

platform, including
development basics, memory
management, concurrency, and
generics Browse through
information on basic
input/output, NIO 2.0, the Java
collections framework, and the
Java Scripting API Get
supplemental references to
fluent APIs, third-party tools,
and basics of the Unified
Modeling Language (UML)
Java Virtual Machine
Build scalable, functional
reactive microservices with
Akka, Play, and Lagom
Advanced Design and
Implementation of Virtual
Machines

In-Depth Advice for Tuning and Programming Java 8, 11, and Beyond

JVM Tutorials - Herong's Tutorial Examples

Coding and testing are generally considered separate areas of expertise. In this practical book, Java expert Scott Oaks takes the approach that anyone who works with Java should be adept at understanding how code behaves in the Java Virtual Machine—including the tunings likely to help performance. This updated second edition helps you gain in-depth knowledge of Java application performance using both the JVM and the Java platform. Developers and performance engineers alike will learn a variety of features, tools, and processes for improving the way the

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Java 8 and 11 LTS releases perform. While the emphasis is on production-supported releases and features, this book also features previews of exciting new technologies such as ahead-of-time compilation and experimental garbage collections. Understand how various Java platforms and compilers affect performance Learn how Java garbage collection works Apply four principles to obtain best results from performance testing Use the JDK and other tools to learn how a Java application is performing Minimize the garbage collector's impact through tuning and programming practices Tackle performance issues in Java APIs Improve Java-driven database application performance

This book is a collection of notes and sample codes written by the author while he was learning JVM himself.

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Topics include JVM (Java Virtual Machine) Architecture and Components; Oracle JVM implementation - HotSpot; Eclipse JVM implementation - Eclipse OpenJ9; java.lang.Runtime - The JVM Instance class; Loading Native Libraries; java.lang.System - Representing Operating System; java.lang.ClassLoader - Loading class files; java.lang.Class - Class reflections; Runtime data areas, heap memory and Garbage Collection; Stack, Frame and Stack overflow; Multi-threading impacts on CPU and I/O; CDS (Class Data Sharing); Micro Benchmark tests on different types of operations. Updated in 2022 (Version v5.12) with HotSpot JVM 17. For latest updates and free sample chapters, visit <https://www.herongyang.com/JVM>.

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Software -- Programming Languages. Immersing students in Java and the Java Virtual Machine (JVM), Introduction to Compiler Construction in a Java World enables a deep understanding of the Java programming language and its implementation. The text focuses on design, organization, and testing, helping students learn good software engineering skills and become better programmers. The book covers all of the standard compiler topics, including lexical analysis, parsing, abstract syntax trees, semantic analysis, code generation, and register allocation. The authors also demonstrate how JVM code can be translated to a register machine, specifically the MIPS architecture. In addition, they discuss recent strategies, such as just-in-time compiling and hotspot compiling, and

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present an overview of leading commercial compilers. Each chapter includes a mix of written exercises and programming projects. By working with and extending a real, functional compiler, students develop a hands-on appreciation of how compilers work, how to write compilers, and how the Java language behaves. They also get invaluable practice working with a non-trivial Java program of more than 30,000 lines of code. Fully documented Java code for the compiler is accessible at <http://www.cs.umb.edu/j--/>

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how to systematically and proactively improve Java performance with today's advanced multicore hardware and complex operating system environments. The authors, who are all leading Java performance and Java HotSpot VM experts, help you improve performance by using modern software engineering practices, avoiding common mistakes, and applying tips and tricks gleaned from years of real-world experience. Picking up where Charlie Hunt and Binu John's classic Java Performance left off, this book provides unprecedented detail on two powerful Java platform innovations: the Garbage First (G1) garbage collector and the HotSpot VM Serviceability Agent. Coverage includes Leveraging G1 to overcome limitations in parallel, serial, and CMS garbage collection Understanding each stage of G1 GC collections, both young and old Getting

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under the hood with G1 and efficiently fine-tuning it for your application Identifying potential optimizations, interpreting experimental results, and taking action Exploring the internals of the HotSpot VM Using HotSpot VM Serviceability Agent to analyze, triage, and resolve diverse HotSpot VM issues Troubleshooting out of memory errors, Java level deadlocks, and HotSpot VM crashes Extending the Serviceability Agent, and using the Plugin for VisualVM Mastering useful HotSpot VM command line options not covered in Java™ Performance Java® Performance Companion can help you squeeze maximum performance and value from Java with JDK 8 or 9—for any application, in any environment. Register your product at informit.com/register for convenient access to downloads, updates, and corrections as they become available.

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