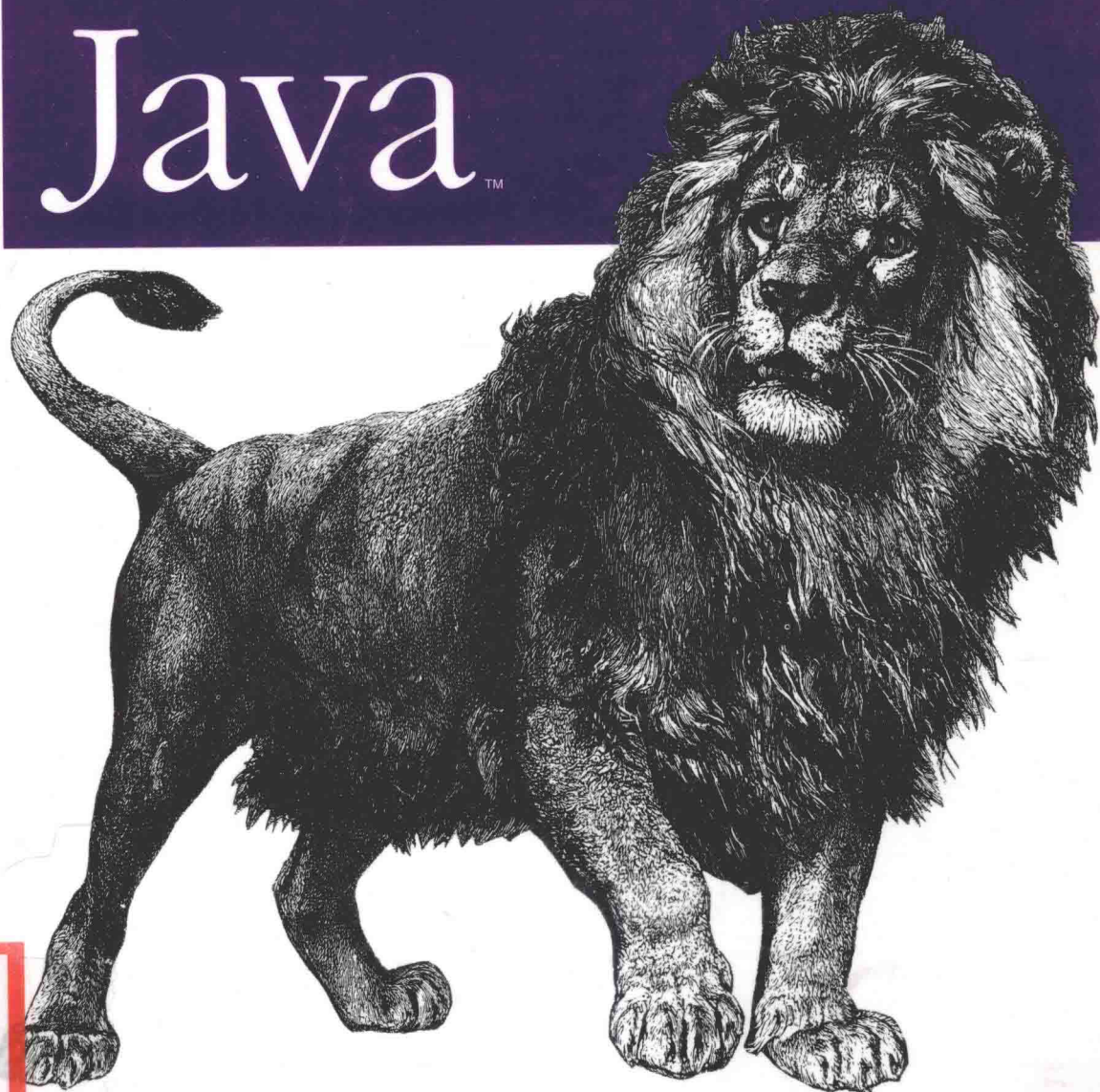


核心Java™ (影印版)

Hardcore Java™



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Robert Simmons, Jr. 著

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Preface

Studying a computer language is a career-long process. Many developers make the mistake of thinking that they have learned enough. They get caught in the corporate cycle of build-and-deploy and don't seek to expand their knowledge. However, we can hardly blame them for that.

For one, the build-and-deploy cycle is intensive and carries with it a substantial amount of political pressure: managers don't want you to spend days reading a book or trying out code snippets when bugs and deadlines are looming. However, developers should take the time to experiment and learn more.

When you expand your skills as a developer, there is some initial time investment. However, this will rapidly pay off in increased productivity and quality. Instead of spending hundreds of hours debugging, you can implement coding standards that block bugs and spend a fraction of that time implementing new features. In the end, everyone wins; your company gets higher-quality code and quicker feature turnaround, and you get to spend more time playing Frisbee with your dog.

The second problem that the corporate developer has to deal with is that the majority of computer books are often not appropriate for the intermediate to advanced developer. When looking at my rather impressive computer book library, much of it from O'Reilly, I notice that my books tend to fall into two categories: many are introductions to concepts and most of the others are references to concepts. Although these books are very useful, there is a distinct lack of books that target the intermediate to advanced programmer. However, there is one shining exception in my library.

In a dusty corner of my desk is a book I bought several years ago. *Secrets of the C++ Masters* by Jeff Alger (Academic Press Limited) is absolutely essential for an intermediate C++ developer. It begins with the assumption that you know the language and then expands from there. The result is a book that can really transform a developer from the intermediate level to a true guru.

That is the goal of this book with regards to the Java™ language. Most of the material is meant to help you avoid many common mistakes made by Java developers. We will also cover nuances of Java, idiosyncrasies of the JDK, and advanced techniques. With luck, this book will increase your productivity and your enjoyment of Java development.

Audience

This book is for the intermediate to advanced Java programmer. With that in mind, we can concentrate on the knowledge and techniques that go into some of the most advanced Java software available.

Prerequisites and Assumptions

Functional proficiency with Java

I will largely gloss over entire areas of Java. I assume that you understand JavaBeans™, bound properties, JDBC, and other basics.

Familiarity with basic computer science

I generally won't spend a lot of time on concepts such as scoping, logic operations, inheritance, and algorithm construction. These and similar concepts will be the basis for more detailed discussions.

Familiarity with UML

The Unified Modeling Language is the best way to express object-oriented engineering concepts in a manner that is familiar to all programmers, regardless of what language they speak. Most of the code diagrams in this book incorporate UML.

Familiarity with the JDK and the virtual machine

You should be familiar with the JDK and with how to compile a program and use its various tools in the JDK. However, expertise in all packages isn't necessary.

Typographical Conventions

This book uses the following font conventions:

Italic

Used for filenames, file extensions, URLs, application names, emphasis, and new terms when they are first introduced

Constant width

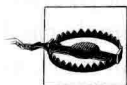
Used for Java class names, functions, variables, components, properties, data types, events, and snippets of code that appear in the text

Constant width bold

Used for commands you enter at the command line and to highlight new code inserted in a running example



This icon designates a note, which is an important aside to the nearby text.



This icon designates a warning.

Code Samples

The code sample set for this book is massive. Almost every snippet of code from the book can be found in the downloadable source code (<http://www.oreilly.com/catalog/hardcoreju>). However, without a guide, you could get lost quickly when surfing through the examples.

Regarding the code itself, I will frequently snip out pieces you would need to get the code to compile and run. Copying this infrastructure code in the book would add unnecessary bulk and potentially cloud the issue being discussed. Since I assume you are experienced in Java, I will also assume you know the housekeeping procedures used to implement pertinent concepts.

One other tactic that I commonly use is to append a number to the name of a class or method. This is designed to show successive versions of the same class or method. The goal is to emphasize the development while allowing the user to look up the old version and play with it if he chooses. For example, you should read `Country4` as `Country`.

Finally, the code samples are very well-documented. However, for brevity's sake, I will usually slice out this documentation when presenting code examples. Although I firmly believe that good Javadoc documentation is important to good development, in this book such documentation would needlessly increase the page count without adding to the discussion.

One other thing to note about the examples is that you will often see the comment `// $NON-NLS-1$` imbedded within the code. This is merely a flagging comment that tells Eclipse not to internationalize a particular String. I have snipped these comments from the book, as they aren't relevant to the discussions.

Locating an Example in the Downloadable Code

Each example cited in the book is formatted as:

```
package oreilly.hcj.review;
public class PointersAndReferences {
    public static void someMethod(Vector source) {
```

```

        Vector target = source;
        target.add("Swing");
    }
}

```

The emphasized lines show that you can find this code in the package `oreilly.hcj.review` and the class `PointersAndReferences`. However, be aware that the code example cited may be embedded with other examples that are not relevant to that particular topic. In fact, I frequently combine several examples from a single subject into one class file to reduce the housekeeping code needed to run the sample. Doing a search on the method name will quickly locate the cited example.

Categories of Examples

The examples themselves can be divided into three categories. Each of these categories has a different usage paradigm that you should be aware of.

Syntax checkers

These are methods and snippets that were written solely for the purpose of checking my syntax in the book. To check my syntax, I leverage the features of Eclipse 3.0M4. However, be aware that the syntax checker examples will often be mixed with other examples in the same class file.

Demonstrators

These examples demonstrate a specific concept but are not executed. They often take the form of methods, which take a certain input and produce a certain output. Mixed in with these samples, you will occasionally find little `main()` methods. I use these simply to test things. If you want to play with them, feel free to do so; however, I do not discuss them in the book.

Some of the demonstrators are also used to demonstrate compiler errors when using certain techniques. To use these examples, you can try changing the files and rebuilding to demonstrate the concept. To compile a single file, there is a special Ant target named `compile_example`. To use the target, simply pass the filename you want to compile in the property example:

```

>ant -Dexample=oreilly/hcj/review/RTTIDemo.java compile_example
Buildfile: build.xml

init:

compile_example:
    [javac] Compiling 1 source file to C:\dev\hcj\bin
    [javac] C:\dev\hcj\src\oreilly\hcj\review\RTTIDemo.java:54: incompatible types

```

```

[javac] found : oreilly.hcj.review.RTTIDemo.A
[javac] required: oreilly.hcj.review.RTTIDemo.B
[javac]      b = (A)a1; // compiler error: a1 is not a B.
[javac]      ^
[javac] C:\dev\hcj\src\oreilly\hcj\review\RTTIDemo.java:55: incompatible types
[javac] found : oreilly.hcj.review.RTTIDemo.C
[javac] required: oreilly.hcj.review.RTTIDemo.B
[javac]      b = (B)c; // compiler error: c is not a B.
[javac]      ^
[javac] 2 errors

```

Executables

Unlike demonstrators, executables are intended to be run and the output examined to demonstrate a concept or prove a point to a skeptical audience. When one of these programs is introduced, I will show you how to run it using Ant:

```

>ant -Dexample=oreilly.hcj.review.ObjectIsGod run_example
run_example:
    [java] class oreilly.hcj.review.ObjectIsGod$SomeClass --|> class
java.lang.Object
    [java] class oreilly.hcj.review.ObjectIsGod$SomeOtherClass --|> class
java.lang.Object

```

The emphasized line gives you the command needed to run the example after the prompt (>). The command is identical in most cases. The only difference is the name of the property example that you pass to the run_example target. While we are on the subject of running the sample code, there is one thing to note about the output. Since all of the examples are run with Ant to get the classpath and other housekeeping done, the actual output from the command will be much longer:

```

>ant -Dexample=oreilly.hcj.review.ObjectIsGod run_example
Buildfile: build.xml

init:

run_example:
    [java] class oreilly.hcj.review.ObjectIsGod$SomeClass --|> class
java.lang.Object
    [java] class oreilly.hcj.review.ObjectIsGod$SomeOtherClass --|> class
java.lang.Object
BUILD SUCCESSFUL
Total time: 1 second

```

Although this is the actual output, most of it is trivial and common to every use of Ant. Therefore, I snip out all of this housekeeping for the sake of brevity. The emphasized lines will be taken out when the run is presented in the book. Therefore, when you run the examples, be aware that Ant is a bit more verbose than I am.

Tools

One of the most important skills in professional development is knowing how to use tools. There are a wide variety of tools available, from the standard text editor and compiler to full-blown IDEs that do everything for you. Selecting the best tools for the job will make you a more productive developer.

UML Diagramming

For creating diagrams in UML, I use a product called Magic Draw UML, by No Magic, Inc. (<http://www.magicdraw.com/>). This tool is, without a doubt, the best professional UML modeling tool on the market. Rational Rose and Together can't even touch the functionality and quality of Magic Draw. I like it so much that I bought a copy of the Enterprise edition for myself. I highly recommend this product. Although it isn't free like other tools I recommend, it is well worth the price.

IDE

The IDE I use is Eclipse 3.0M4, which happens to be the IDE I use professionally as well. Eclipse simply has the single best development tool on the market. I don't know how I could live without my refactoring tools and the other goodies that come with Eclipse. You can find Eclipse at <http://www.eclipse.org/>. Also, I use many Eclipse plug-ins to make my job easier. They can be found in the Community section of eclipse.org, or you can surf the best directory of Eclipse plug-ins at <http://eclipse-plugins.2y.net/eclipse/index.jsp>.

Out-of-IDE Building

For building outside of my IDE and running examples, I use Apache Ant 1.5, which is available from <http://ant.apache.org/>. Ant is simply the best make program ever invented. I take my hat off to the folks at Apache.

Logging

I use Jakarta Log4J to do logging in my programs. Log4J is available from <http://jakarta.apache.org/log4j/docs/index.html>. In much of the sample code, there is little logging. However, in production systems, I am a logging fanatic.



For those of you that are curious, I don't use the JDK 1.4 logging mechanism because it is, in my opinion, vastly inferior to Log4J on many levels.

Jakarta Commons

Another set of libraries that I often use in my professional code is the Jakarta Commons Libraries. These libraries are available from <http://jakarta.apache.org/commons/index.html>. They extend the JDK to include things that Sun either forgot to include or decided not to include in the JDK. Many of the common tools you will learn about later in the book, such as `ConstantObject`, will be submitted to Jakarta Commons after this book is published to make them more reusable. For now, though, you will find these tools in the *Hardcore Java* source code itself. If you haven't checked out the Commons Libraries, I strongly advise you to do so.

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I would also like to thank all of the junior programmers that have worked for me and kept my eyes open to new ideas. There is nothing like a fresh mind to suggest things that are radical, untried, and, in the end, brilliant. Certain people leap to mind, such as Bettina Linssen, now a senior developer. Even though I had considered myself something of a guru in Java GUI coding, her fresh insight and ideas taught me a thing or two. All you senior developers out there would be well advised to listen to the ideas of your junior developers. You never know what they might teach you.

I would also like to extend very special thanks to Marco Kukulies. Marco started his programming career as a junior developer working for me. He excelled beyond all expectations and demonstrated that he has that special gift that separates the normal programmers from the true gurus. Marco is now one of the best senior developers and architects I know. He has earned my respect, trust, and eternal friendship. Marco reviewed all of my book from a reader's perspective and gave me invaluable advice on what needed to be clarified, expanded on, or removed.

I would also like to thank one of my best friends who has little to do with programming but has provided endless moral support to keep me energized and working. Although my friend Saćir Husejnovic isn't a programmer, and generally doesn't understand much of my work, without his and Marco Kukulies' moral support, this book simply wouldn't have happened. My deepest respect goes out to these two gentlemen as well as to Saćir's wife Mirsada, and his three children Aida, Selma, and Amela. Thanks for being a second family to me!

I would also like to thank my new wife Alma for being the wonderful person she is and supporting me through all of my efforts to write and maintain this book.

In addition, I would like to thank all of my readers from all over the world who have submitted errata. Your vigilance has helped refine my work and kept me honest. I look forward to your feedback, concerns and questions.

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Last, but definitely not least, I would like to thank my editor Brett McLaughlin, who can be found buried under piles of electronic chapters. Just look for the hand reaching up frantically for help. His editing prowess has increased the quality of my work to a level I never knew possible. When I proposed this book to O'Reilly, it was in a much rougher state than it is now. With many publishers, I would have been mostly on my own. However, O'Reilly has really worked hard to help me make this book one that I can be proud of. I have learned a lot, and Brett has truly converted me from a newbie author to a professional.

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