Java® 9 for Programmers

New Java® 9 Features

• Java® 9’s Platform Module System
• Interactive Java via JShell—Java 9’s REPL
• Collection Factory Methods, Matcher Methods, Stream Methods, JavaFX Updates, Using Modules in JShell, Compliementable Future Updates, Security Enhancements, Private Interface Methods and many other language and API updates.

Core Java Features

• Classes, Object, Encapsulation, Inheritance, Polymorphism, Interfaces
• Composition vs. Inheritance
• “Programming to an Interface not an Implementation”
• Lambdas, Sequential and Parallel Streams, Functional Interfaces with Default and Static Methods, Immutability
• JavaFX GUI, 2D and 3D Graphics, Animation, Video, CSS, Scene Builder
• Files, I/O Streams, XML Serialization
• Concurrency for Optimal Multi-Core Performance, JavaFX Concurrency APIs
• Generics and Generic Collections
• Recursion, Database (JDBC and JPA)

Core Java Features (Continued)

• Streams, Functional Interfaces, object serialization, concurrency, generics, generic collections, database with JDB and JPA, and compiling new Java 9 features, such as the Java Platform Module System, Interactive Java with JShell for drill-down case study, including a complete Java implementation. When you’re finished, you’ll have everything you need to build industrial-strength, object-oriented Java 9 applications.

Paul Deitel and Harvey Deitel are the founders of Deitel & Associates, Inc., the internationally recognized programming languages authoring and corporate training organization. Millions of people worldwide have used Deitel instructor-led training, professional books, textbooks, LiveLessions video products, Learning Paths in the Safari service (http://www.safaribooksonline.com), e-books, resource centers and REVEL® interactive multimedia courses with integrated labs and assessment to master major programming languages and platforms, including Java® C++ , C#, Android™, iOS, Swift™, Python™, Visual Basic® and Internet and web programming.

COMMENTS FROM RECENT EDITIONS REVIEWERS

“Content is superbly covered. Java 9 introduces modules—a major shaking to the Java ecosystem that brings numerous benefits, but also new challenges, terminology and patterns. Developers moving to Java 9 must know how to interact with modules, and the book does an expert job at clearly introducing these concepts. The book also covers numerous of the Java 8 and Java 9 features, such as JShell, lambda expressions and JavaFX improvements. With this knowledge, developers can realize massive productivity gains by benefiting from the state of the art in Java. I highly recommend this book to all professionals looking to keep current with the very latest Java developments.”
—Jonathan Goo, Consulting Member of Technical Staff, Oracle

“Provides a thorough introduction to the JShell tool for discovery. Java 9 for Programmers takes full advantage of that with interesting exercises.”
—Robert Field, MD Architects, Oracle

“Covers JavaFX functionality that makes it easy to create nice, usable interfaces. A great overview on how concurrency can help developers leverage multi-core processors.”
—Johan Vos, CTO, Cloud Products at Gluon, Java Champion

“The combination of theory, clear explanation and example code makes this both a great learning experience and an excellent reference that’s useful for any developer to have close at hand. Provides a great overview of the Java Platform Module System! I particularly like the way you explained the importance of modularity. Code examples are sufficiently complex to be realistic, but simple enough to understand. Covers all the topics I expected to see in modularity (more optionally, especially around visualizing dependencies).”
—Khalil Oue, Infinote, Java Champion

“Nice job on JShell. The most recent changes to Java are by far the biggest evolutions to the language and the platform in over 20 years. The changes are complex and intriguing, but Paul and Harvey have distilled the concepts to an easily digestible form, with plenty of examples. This book is an excellent, comprehensive resource for deeper learning of Java and its ecosystem.”
—Dr. Yavash Sabouran, President, Agile Developers, Inc. and Instructional Professor, University of Houston

The professional programmer’s Deitel® guide to Java® 9 and the powerful Java platform

Written for programmers with a background in another high-level language, this book applies the Deitel signature live-code approach to teaching programming and explores the Java® language and APIs in depth. The book presents concepts in fully tested programs, complete with code walkthroughs, syntax shading, code highlighting and program outputs. It features hundreds of complete Java 9 programs with thousands of lines of proven code, and hundreds of software-development tips that will help you build robust applications.

Start with an introduction to Java using an early classes and objects approach, then rapidly move on to more advanced topics, including JavaFX GUI, graphics, animation and video, exception handling, lambdas, streams, functional interfaces, object serialization, concurrency, generics, generic collections, database with JDB and JPA, and compiling new Java 9 features, such as the Java Platform Module System, Interactive Java with JShell for drill-down case study, including a complete Java implementation. When you’re finished, you’ll have everything you need to build industrial-strength, object-oriented Java 9 applications.

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DEITEL® DEVELOPER SERIES

The DEITEL® DEVELOPER SERIES is designed for professional programmers. The series presents focused treatments on emerging and mature technologies, including Java®, C++, C#, and .NET, JavaScript®, Internet and web development, Android®, app development, iOS® app development, Swift®, and more. Each book in the series contains the same live-code teaching methodology used in the Deitel's HOW TO PROGRAM SERIES' college textbooks—in this book, most concepts are presented in the context of completely coded, live apps.

ABOUT THE COVER

The cover art we selected reflects some key themes of Java® 9 for Programmers. The art includes a colorful collection of sea shells—one of Java 9's key features is JShell, which is Java 9's REPL (read-eval-print-loop) for interactive Java. JShell is one of the most important pedagogic and productivity enhancements to Java since it was announced in 1995. We discuss JShell in detail in Chapter 23 and show how you can use it for discovery and experimentation, rapid prototyping of code segments and to learn Java faster. The shell art is overlaid upon a sphere of jigsaw puzzle pieces representing the earth. The most important new software-engineering capability in Java 9 is the Java Platform Module System (Chapter 27)—which was developed by Project Jigsaw.

DEITEL & ASSOCIATES, INC.

Deitel & Associates, Inc., founded by Paul Deitel and Harvey Deitel, is an internationally recognized authoring and corporate training organization, specializing in computer programming languages, object technology, Internet and web software technology, and Android and iOS app development. The company's clients over the years have included many of the world's largest corporations, government agencies, branches of the military and academic institutions. The company offers instructor-led training courses delivered at client sites worldwide on major programming languages and platforms. Through its 15-year ongoing partnership with Prentice Hall/Pearson, Deitel & Associates, Inc., creates leading-edge programming professional books, college textbooks, LiveLessons video products, Learning Paths in the Safari service, leading-edge programming professional books, college textbooks, LiveLessons video products, Learning Paths in the Safari service, and subscribe to the Deitel Buzz Online newsletter (www.deitel.com/newsletter/subscribe.html).

COMMENTS FROM RECENT EDITIONS REVIEWERS

“Given the benefit of the wisdom derived from many years of software development experience!” —Edward F. Gehring, North Carolina State University

“Great book for studying the world's most popular programming language. Introduces good design practices and methodologies from the beginning. Excellent starting point for developing high-quality, robust Java apps. Excellent and easy-to-follow description of Java's new object-oriented programming fundamentals. Excellent polymorphism chapter. Introduces JavFX, the next generation of client applications in Java—like the use of Scene Builder to create GUIs with drag-and-drop design rather than by hand, which shows the way it should be done. Excellent generic collections chapter. Covers lambdas and streams very well.” —Simon Ritter, Oracle (new Deity CTO at Azul Systems)

“Want to take your Java skills to the next level? This book is the ultimate guide. I’ve enjoyed and learned much from it. Every major Java feature is methodically covered. This is more than a book—it’s a career-building program—I really enjoyed the Lambdas and Streams chapter.” —Breno Souza, President of Soulaue (the Brazilian Java Society), Java Specialist at TeleCloud, Java Champion and Soulaue representative at the Java Community Process

“The change from Java 8 to Java 9 is an important one, and developers should be prepared. Covers the Java Platform Module System and its role in creating complex applications in large systems. It clearly describes the concepts of modules, dependencies and services. Once core samples show how to leveraging libraries composed of Java 9 modules and how to migrate existing code and libraries into the modularized world of Java 9. Brings the reader up to speed with what to expect as Java evolves.” —John Vuc, CTO, Cloud Products at Glenn, Java Champion

“Complete and approachable coverage of Java 9's modularity, which will change how you develop—the book motivates it, clearly explains its details and provides complete, working code examples, emphasizing good practices. Likely to reflect the state-of-the-art in Java technologies. I especially like the superb chapter that covers JShell, one of the flagships of Java 9. It's an invaluable discovery tool for learning and teaching Java with ease. Deep and crystal-clear explanations. Great job on JavFX—the style-killer-art Java GUI, graphics and multimedia technology. Makes learning generic collections enjoyable.” —Joh Antonio Gonzales Sosa, Consultant

“A very impressive treatment is given to many JavFX concepts. —James L. Weaver, Java Champion, Co-author at Pro JavFX 8

“OD design techniques are incorporated throughout. Good polymorphism and interface examples.” —Sue McFarland Metzger, Villanova U.

“Excellent introduction to functional programming with lambdas and streams!” —Manfred Riem, Java Champion

“I’m really impressed with the book’s quality—it makes difficult concepts very clear. A great job exploring APIs and patterns. Stackframes explanation helps developers understand what’s happening under the hood. Guiding the reader to avoid dangerous patterns is as important as explaining the correct syntax—great work! The reader is encouraged to think wisely and take a pragmatic approach, which I like very much. Great polymorphism chapter—helps the reader distinguish between abstract classes and interfaces with default methods. Good discussion of analyzing exception stack traces for debugging information. Very good introduction to lambdas. One of the best explanations of generics I've read. Clearly explains collections, and when and how they should be used for best performance. Excellent presentation of lambdas and streams. Clear introduction to JPA that will save developers from lots of boilerplate code—shows how to use JPA to perform relatively complex queries that span multiple database tables.” —John Vuc, CTO, Cloud Products at Glenn, Java Champion

“I really like the use of test classes to demonstrate functionality—this is good practice. You get a good feel for when you should use lambdas and streams. Solid intro to JShell, with plenty of handson code to demo its features—this chapter taught me things and felt very valuable.” —Trisha Goo, Jeffrees, Java Champion

“You’ll be on your way to becoming a great Java programmer with this book.” —Peter Pilgrim, Java Champion, Consultant

“Of immense value to practitioners of the object-oriented approach. Derives inheritance and polymorphism, and illustrates their use in getting elegant, simple and maintainable code. The OOD design case study presents the object-oriented approach, from requirements to Java code.” —Vined Varma, Astro Infotech Private Limited

“The OOD ATM case study puts many concepts from previous chapters together in a plan for a large program, showing the object-oriented design process—the discussion of inheritance and polymorphism is especially good.” —Sue Roff, Drake University

“I wish I had this book when I was learning how to program! Great introduction to the software engineering process. Fantastic book and reference. Provides great detail on the latest Java features including lambdas. The code examples make it easy to understand the concepts. GUI examples are very good.” —Lance Anderson, Principal Member of the Technical Staff, Oracle

“I like the Employee polymorphism example and the clear definitions of regular expressions. Good introduction to collections and hashtable performance. Solid threading treatment.” —Dr. Danny Crawford, Oracle (now Principal Software Engineer at lipidic Robotics)