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——Sun Certified Programmer & Developer for Java 2

(Exam 310-035 & 310-027) (英文版)

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Bert Bates

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内容提要

本书以 Java 2 的 SCJP 和 SCJD 认证考试为目标,内容涵盖了 SCJP 和 SCJD 核心考试的所有考试要点,尽可能详细地介绍了参加 SCJP 和 SCJD 的应试者以及其他高级用户所应该掌握的所有技能。

本书在介绍考试要点时针对每个考试目标,使用了大量的插图、表格、试验、测试等,使读者在牢固掌握知识点的同时,轻松地获得丰富的实践经验。

本书由具有丰富 SCJP 和 SCJD 考试经验的专家编写,是参加 SCJP 和 SCJD 的考试人员的必备考试教材。本书也是一本学习使用 Java 2 的很好的参考书,还可以作为一些疑难问题的速查手册。

ABOUT THE CONTRIBUTORS

About the Author

Kathy Sierra is a co-developer of the SCJP 1.4 exam (310-035) and Sun's ePractice exam. She is also a Sun Certified Java Instructor and master trainer for Sun Educational Services, where she teaches other Java instructors. Her full-time job since 1998 has been to help others learn Java and prepare for the SCJP exam, and she also is also the sole founder of what is arguably the world's largest Java certification web site, Javaranch.com. Kathy has worked for Sun Educational Services worldwide headquarters in the course development, customer training, and certification departments. Prior to that, she worked as an instructor for UCLA Extension's IBM New Media Lab, and developed games for Virgin, MGM, and Amblin' Entertainment. She can be reached at Kathy.Sierra@wickedlysmart.com.

About the Co-Author

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Praise for the *Sun Certified Programmer & Developer for Java 2 Study Guide*

"Kathy Sierra is one of the few people in the world who can make complicated things seem damn simple. And as if that isn't enough, she can make boring things seem interesting. I always look forward to reading whatever Kathy writes—she's one of my favorite authors."

—*Paul Wheaton, Trail Boss JavaRanch.com*

"Who better to write a Java study guide than Kathy Sierra, the reigning queen of Java instruction? Kathy Sierra has done it again—here is a study guide that almost guarantees you a certification!"

—*James Cubeta, Systems Engineer, SGI*

"The thing I appreciate most about Kathy is her quest to make us all remember that we are teaching people and not just lecturing about Java. Her passion and desire for the highest quality education that meets the needs of the individual student is positively unparalleled at SunEd. Undoubtedly there are hundreds of students who have benefited from taking Kathy's classes."

—*Victor Peters, founder Next Step Education & Software Sun Certified Java Instructor*

"I want to thank Kathy for the EXCELLENT Study Guide. The book is well written, every concept is clearly explained using a real life example, and the book states what you specifically need to know for the exam. The way it's written, you feel that you're in a classroom and someone is actually teaching you the difficult concepts, but not in a dry, formal manner. The questions at the end of the chapters are also REALLY good, and I am sure they will help candidates pass the test. Watch out for this Wickedly Smart book."

—*Alfred Raouf, Web Solution Developer*

"The Sun Certification exam was certainly no walk in the park, but Kathy's material allowed me to not only pass the exam, but Ace it!"

—*Mary Whetsel, Sr. Technology Specialist,
Application Strategy and Integration, The St. Paul Companies*

"Bert has an uncanny and proven ability to synthesize complexity into simplicity offering a guided tour into learning what's needed for the certification exam."

—*Thomas Bender, President, Gold Hill Software Design, Inc.*

"With his skill for clearly expressing complex concepts to his training audience, every student can master what Bert has to teach."

—*David Ridge, CEO, Ridge Associates*

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INTRODUCTION

In This Book

This book is organized in such a way as to serve as an in-depth review for the Sun Certified Programmer for the Java 2 Platform 1.4 exam for both experienced Java professionals and those in the earlier stages of experience with Java technologies. Each chapter covers a major aspect of the exam, with an emphasis on the “why” as well as the “how to” of programming in the Java language. The book also includes an in-depth review of the essential ingredients for a successful assessment of a project submitted for the Sun Certified Java Developer exam.

What This Book Is Not

You will not find a beginners guide to learning Java in this book. All 700+ pages of this book are dedicated solely to helping you pass the exams. If you are brand new to Java, we suggest you spend a little time learning the basics, and should not start with this book until you know how to write, compile, and run simple Java programs. We do not, however, assume any level of prior knowledge of the individual topics covered. In other words, for any given topic (driven exclusively by the actual exam objectives), we start with the assumption that you are new to that *topic*. So we assume you’re new to the individual topics, but we assume that you are *not* new to Java.

We also do not pretend to be both preparing you for the exam *and simultaneously making you a complete Java being*. This is a certification exam study guide, and it’s very clear about its mission. That’s not to say that preparing for the exam won’t help you become a better Java programmer! On the contrary, even the most experienced Java developer often claims that having to prepare for the certification exam made him a far more knowledgeable and well-rounded programmer than he would have been without the exam-driven studying.

On the CD

For more information on the CD-ROM, please see Appendix A.

In Every Chapter

In the Programmer's Exam section of the book (Part I), we've created a set of chapter components that call your attention to important items, reinforce important points, and provide helpful exam-taking hints. Take a look at what you'll find in every chapter:



- Every chapter begins with the **Certification Objectives**—what you need to know in order to pass the section on the exam dealing with the chapter topic. The Objective headings identify the objectives within the chapter, so you'll always know an objective when you see it!

- **Exam Watch** notes call attention to information about, and potential pitfalls in, the exam. These helpful hints are written by authors who have taken the exams and received their certification—who better to tell you what to worry about? They know what you're about to go through!

- **Practice Exercises** are interspersed throughout the chapters. These are step-by-step exercises that allow you to get the hands-on experience you need in order to pass the exams. They help you master skills that are likely to be an area of focus on the exam. Don't just read through the exercises! They provide hands-on practice that you should be comfortable completing. Learning by doing is an effective way to increase your competency.



- **On The Job** notes describe the issues that come up most often in real-world settings. They provide a valuable perspective on certification-related topics. They point out common mistakes and address questions that have arisen from on the job discussions and experience.

- **From The Classrooms** describe the issues that come up most often in the training classroom setting. These sidebars highlight some of the most common and confusing problems that students encounter when taking a live Java training course. You can get a leg up on those difficult-to-understand subjects by focusing extra attention on these sidebars.

- **Scenario and Solutions** sections lay out potential problems and solutions in a quick-to-read format:

SCENARIO & SOLUTION

What benefits do you gain from encapsulation?	Ease of code maintenance, extensibility, and code clarity.
What is the object-oriented relationship between a tree and an oak?	An IS-A relationship: Oak IS-A Tree.
What is the object-oriented relationship between a city and a road?	A HAS-A relationship. City HAS-A Road.

- The **Certification Summary** is a succinct review of the chapter and a restatement of salient points regarding the exam.



- The **Two-Minute Drill** at the end of every chapter is a checklist of the main points of the chapter. It can be used for last-minute review.

Q&A

- The **Self Test** offers questions that closely simulate the topics, structure, and nature of those found on the certification exam. The answers to these questions, as well as explanations of the answers, can be found at the end of each chapter. By taking the Self Test after completing each chapter, you'll reinforce what you've learned from that chapter while becoming familiar with the tricky structure of the exam questions. You can also use the Self Test questions as a way to assess your readiness to take the actual exam. The author helped to develop the *real* exam, so she has a pretty good idea of how the real questions are structured!

Some Pointers

Once you've finished reading this book, set aside some time to do a thorough review. You might want to return to the book several times and make use of all the methods it offers for reviewing the material:

1. *Re-read all the Two-Minute Drills*, or have someone quiz you. You also can use the drills as a way to do a quick cram before the exam. You might want

to make some flash cards out of 3×5 index cards that have the Two-Minute Drill material on them.

2. *Re-read all the Exam Watch notes.* Remember that these notes are written by authors who have taken the exam and passed. They know what you should expect—and what you should be on the lookout for.
3. *Review all the S&S sections* for quick problem solving.
4. *Re-take the Self Tests.* Taking the tests right after you've read the chapter is a good idea, because the questions help reinforce what you've just learned. However, it's an even better idea to go back later and do all the questions in the book in one sitting. Pretend that you're taking the live exam. (When you go through the questions the first time, you should mark your answers on a separate piece of paper. That way, you can run through the questions as many times as you need to until you feel comfortable with the material.)
5. *Complete the Exercises.* Did you do the exercises when you read through each chapter? If not, do them! These exercises are designed to cover exam topics, and there's no better way to get to know this material than by practicing. Be sure you understand why you are performing each step in each exercise. If there is something you are not clear on, re-read that section in the chapter.

Introduction to the Material in the Book

This section will help prepare you to take the Programmer exam. Tips and preparation notes for the Developer exam are presented in the Developer Exam chapters in Part II (Chapters 10–17). The Sun Certified Java Programmer (SCJP) exam is considered one of the hardest (if not *the* hardest) in the IT industry, and we can tell you from experience that a large chunk of exam candidates go in to the test unprepared. And we're talking about the ones who already know Java quite well and have been programming in it for years! As programmers, we tend to learn only what we need to complete our current project, given the insane deadlines we're usually under. But this exam attempts to prove your complete understanding of the Java language, not just the parts of it you've become familiar with in your work.

Experience alone will rarely get you through this exam with a passing mark, because even the things you *think* you know might work just a little different than you imagined. It isn't enough to be able to get your code to work correctly; you *must*

understand the core fundamentals in a deep way, and with enough breadth to cover virtually anything that could crop up in the course of using the language.

The Sun Certified Developer Exam is unique to the IT certification realm, because it actually evaluates your skill as a developer rather than simply your knowledge of the language or tools. Becoming a Certified Java Developer is, by definition, development experience.

Who Cares About Certification?

Employers do. Headhunters do. Programmers do. Sun's programmer exam has been considered the fastest-growing certification in the IT world, and the number of candidates taking the exam continues to grow each year. Passing this exam proves three important things to a current or prospective employer: you're smart; you know how to study and prepare for a challenging test; and, most of all, you know the Java language. If an employer has a choice between a candidate that's passed the exam and one who hasn't, the employer knows that the certified programmer does not have to take time to learn the Java language.

But does it mean that you can actually develop software in Java? Not necessarily, but it's a good head start. To really demonstrate your ability to develop (as opposed to just your knowledge of the language), you should consider the Developer Exam, where you're given an assignment to build a program, start to finish, and submit it for an assessor to evaluate and score.

Sun's Certification Program

Currently there are four Java certification exams. They are the *Programmer*, the *Developer*, the *Web Component Developer*, and the *Architect* exams. The Programmer and Web Component Developer exams are exclusively multiple-choice exams taken at a testing center, while the Developer and Architect exams involve submitting a project.

The Programmer Exam (CX-310-035)

Sun Certified Programmer for Java 2 Platform 1.4

The Programmer exam is designed to test your knowledge of the Java programming language itself. It requires detailed knowledge of language syntax, core concepts, and

a small number of application programming interfaces (APIs). It does not test any issues related to program design or architecture, and it does not ask why one approach is better than another, but rather it asks whether the given approach works in a particular situation.

The Developer Exam (CX-310-252A, CX-310-027)

Sun Certified Developer for Java 2 Platform 1.4

The Developer exam picks up where the Programmer exam leaves off. Passing the Programmer exam is required before you can start the Developer exam. The Developer exam requires you to develop an actual program and then defend your design decisions. It is designed to test your understanding of why certain approaches are better than others in certain circumstances, and to prove your ability to follow a specification and implement a correct, functioning, and user-friendly program.

The Developer exam consists of two pieces: a project assignment, and a follow-up essay exam. Candidates have an unlimited amount of time to complete the project, but once the project is submitted, the candidate then must go to a testing center and complete a short follow-up essay exam, designed primarily to validate and verify that it was *you* who designed and built the project.

The Web Component Developer Exam (CX-310-080)

Sun Certified Web Component Developer for J2EE Platform

The web developer exam is for those who are using Java technology servlet and JSP (Java Server Pages) to build Web applications. It's based on the Servlet and JSP specifications defined in the Java 2 Enterprise Edition (J2EE). Like the Developer exam, it also requires that the candidate is a Sun Certified Java Programmer.

The Architect Exam (CX-310-051)

Sun Certified Enterprise Architect for J2EE Technology

This certification is for enterprise architects, and thus does not require that the candidate pass the Programmer exam. The Architect exam is in three pieces: a knowledge-based multiple-choice exam, an architectural design assignment, and a follow-up essay exam. You must successfully pass the multiple-choices exam before registering and receiving the design assignment.

Taking the Programmer's Exam

In a perfect world, you would be assessed for your true knowledge of a subject, not simply how you respond to a series of test questions. But life isn't perfect, and it just isn't practical to evaluate everyone's knowledge on a one-to-one basis.

For the majority of its certifications, Sun evaluates candidates using a computer-based testing service operated by Sylvan Prometric. This service is quite popular in the industry, and it is used for a number of vendor certification programs, including Novell's CNE and Microsoft's MCSE. Thanks to Sylvan Prometric's large number of facilities, exams can be administered worldwide, generally in the same town as a prospective candidate.

For the most part, Sylvan Prometric exams work similarly from vendor to vendor. However, there is an important fact to know about Sun's exams: they use the traditional Sylvan Prometric test format, not the newer adaptive format. This gives the candidate an advantage, since the traditional format allows answers to be reviewed and revised during the test.



Many experienced test takers do not go back and change answers unless they have a good reason to do so. Only change an answer when you feel you may have misread or misinterpreted the question the first time. Nervousness may make you second-guess every answer and talk yourself out of a correct one.

To discourage simple memorization, Sun exams present a potentially different set of questions to different candidates. In the development of the exam, hundreds of questions are compiled and refined using beta testers. From this large collection, questions are pulled together from each objective, and assembled into several different versions of the exam.

Each Sun exam has a specific number of questions (the Programmer's exam contains 61 questions) and test duration (120 minutes for the Programmer's exam). Testing time is typically generous; the 310-035 exam has (for the first time in the Programmer's exam history) generated comments that time *could* be a factor for those not well prepared. The time remaining is always displayed in the corner of the testing screen, along with the number of remaining questions. If time expires during an exam, the test terminates, and incomplete answers are counted as incorrect.

At the end of the exam, your test is immediately graded, and the results are displayed on the screen. Scores for each subject area are also provided, but the system