Sun认证Java 2程序员

考试辅导

下册——SL-275/375

- 最贴近考生需求的辅导教材

连凤春　黄艳虹　戢中东 编著

清华大学出版社

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内 容 简 介

本书由 Sun 公司授权的 Java 培训师精心创作，分上、下两册。上册侧重于 Java 语言的基本概念及其应用，力求通过代码表述问题特征、建立概念模型、体现实际应用。下册按照 SL-275（也包含 SL-375 内容）的考试大纲安排章节，总结考点、提炼概念规则、对重点难点问题进行分析，同时提供了大量的模拟试题及其答案。

下册根据考试大纲的内容——声明和访问控制；程序流程控制和异常处理；垃圾回收；语言基础；操作符和分配赋值；重载、覆盖、运行时类型和面向对象；多线程；Java.awt 包；Java.lang 包；Java.util 包；Java.io 包——以提纲的形式对考试内容中的难点和重点，尤其是内部类和匿名内部类，作了详细的分析，其目的是帮助广大考生顺利通过考试，取得认证证书。

本书针对欲参加 Sun 认证 Java 程序员考试的读者，是获取 SCJP 认证的首选辅导教材；适用于 Java 语言初、中级水平、甚至是零基础的学习者；对于 Java 程序员也具有较好的参考价值。

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前　言

众所周知，Java 以其独有的开放性、跨平台性和面向网络的交互性席卷全球，以其安全性、易用性和开发周期短的特点，迅速从最初的编程语言发展成为全球第二大软件开发平台。这些优点已引起国内外计算机界的极大关注；Java 公用规范（PAS）已被国际标准化组织（ISO）认定，Java 技术已列为当今世界信息技术三大要点之一。

Sun 公司为了为业界建立一套认证的标准，特别是针对最先进的科技，推出了 Java 及 Solaris 的认证方案。根据这些认证，在企业方面可以藉此作为招聘人才的评判标准，或是作为衡量员工技术水准的依据；在技术方面，通过这些认证也可以证明个人的技术能力。因此，早日掌握 Java 技术，对每个有志于在 IT 行业发展的人来说是尤为重要的。我们深信 Java 技术的应用和普及，必将成为势不可挡的潮流迅速在世界各地发展。

Sun Java 认证是业界惟一经 Sun 授权的 Java 认证，考试内容涉及所有 Java 的相关知识、编程概念及 Applet 开发技巧。Sun 认证 Java 程序员考试旨在观察考生通过应用软件分配进行复杂编程的能力。

中国地区的 Java 认证考试有两个版本，即英文版和中文版。但是，中文版的 Java 认证不能够全球通用，只适合在中国地区使用，所以，绝大多数考生希望能够取得英文版的 Java 认证。

市场上也有一些相关的英文版辅导教材，但由于受英语水平所限，大多数的考生在阅读英文版教材时存在着诸多阻碍。因此，希望能够分“两步走”。首先，通过中文版教材全面掌握 Java 技术内容，然后再阅读英文原版教材学习更丰富的技术内容。这样，可以加强对英文版的 Java 知识点的理解能力，有利于通过英文版的 Java 认证考试。

编者是 Sun 公司授权的 Java 培训教师，受聘于银河网络教育中心，是 Sun 授权 T3 的全国优秀教师。在给考生培训的过程中，经常有考生请编者推荐合适的中文版 Java 认证考试辅导教材。可是，从目前的图书市场上看，Java 认证考试辅导教材是良莠不齐。有的教材覆盖面大，但针对性不强；从 2000 年到现在，Java 认证的考试大纲已经更新了多次，有的教材还是 3 年或更多年以前的“成果”，过于陈旧，已不能够满足当前的考试需求。

鉴于以上种种原因，也为了满足广大参加 Java 认证考试的考生的强烈要求，编者将多年的教学经验和授课精华展示在本书中与大家共享，其目的是为广大考生提供一本中文版的、针对性强的 Java 认证考试辅导教材。

为了适应不同考生参加 Java 程序员认证考试的需要，编者将本书分为上、下两册。上册根据 Sun 公司的培训课程（编号为 SL-275）安排了相应的内容。通过学习上册内容，考生将具备以下基本能力：

- 使用 Java 编程语言创建 Java 应用程序和 Applet；
- 定义和描述垃圾收集，安全性和 Java 虚拟机（JVM）；
- 描述和使用 Java 语言面向对象的特点；
- 开发图形用户接口（GUI），利用 Java 支持的多种布局管理；

- 描述和使用 Java1.1 的事件授权处理模式；
- 使用 Java 语言的鼠标输入、文本、窗口和菜单窗口部件；
- 使用 Java 的异常处理来控制程序执行和定义用户自己的异常事件；
- 使用 Java 语言的先进的面向对象特点，包括方法重载、方法覆盖、抽象类、接口、final、static 和访问控制；
- 实现文件的输入输出（I/O）；
- 使用 Java 语言内在的现成模式来控制多线程；
- 使用 Java 的 Sockets 机制进行网络通信。

下册则根据 Sun 公布的 SCJP 认证考试大纲的内容——声明和访问控制；程序流程控制和异常处理；垃圾回收；语言基础；操作符和分配赋值；重载、覆盖、运行时类型和面向对象；多线程；Java.awt 包；Java.lang 包；Java.util 包；Java.io 包——以提纲的形式对考试内容中的难点和重点作了详细的分析，其目的是帮助广大考生顺利通过考试，取得认证证书。

本书适用于参加 Sun 认证 Java 程序员考试的广大考生，对于有意参加 Java2 程序员认证考试及学习 Java2 的读者而言，也是一本非常适用的辅导教材。

由于编者水平有限，书中难免有不足之处，希望读者批评指正。联系方式：Lianfch@sohu.com。

另外，本书中的程序代码、部分模拟试题及 JDK1.4 的安装程序均可从北京科海电子出版社 http://www.khp.com..cn 上下载。

编者

2003 年 9 月

目　录

第 1 章　Java 程序员认证考试大纲

现在有两个版本的 Java 程序员的认证考试，一个是面对 Java1.2 及 Java1.3 版的考试，其培训编号为 SL-275，考试代号为 310-025；还有一种考试是面对 Java1.4 版的，其培训编号为 SL-375，考试代号为 310-035。

通过以上两种考试的任何一种，都可以拿到 Sun 的 SCJP（Sun Certified Java Programmer，Sun 认证 Java 程序员）资格证书。这两种考试所取得的证书是等值的，因为其证书的意义是：就对应的 Java 语言的版本而言，具有程序员资格。虽然如此，现在和将来通过认证的朋友，还是应该去拿到 Java1.4 版的认证。因为从版本的升级和向前兼容的角度来看，新的版本毕竟将在应用市场上取代原来的版本！新的认证也自然应该取代原来的老版本认证。现在的 Sun 认证体系中，已经有了 1.2 版到 1.4 版的升级考试。

这两个版本都存在中文版的考试，但是，通过汉语版的考试所拿到的证书不具有全球通用性。

1.1　Java 1.2 版的考试大纲

Sun Certified Programmer For Java[TM] 2 Platform 1.2

SECTION 1: DECLARATIONS AND ACCESS CONTROL

- Write code that declares, constructs, and initializes arrays of any base type using any of the permitted forms both for declaration and for initialization.
- Declare classes, inner classes, methods, instance variables, static variables, and automatic (method local) variables making appropriate use of all permitted modifiers (such as public, final, static, abstract, and so forth).
- State the significance of each of these modifiers both singly and in combination, and state the effect of package relationships on declared items qualified by these modifiers.
- For a given class, determine if a default constructor will be created, and if so, state the prototype of that constructor.
- State the legal return types for any method given the declarations of all related methods in this or parent classes.

SECTION 2: FLOW CONTROL AND EXCEPTION HANDLING

- Write code using if and switch statements and identify legal argument types for these statements.
- Write code using all forms of loops including labeled and unlabeled use of break and continue, and state the values taken by loop control variables during and after loop execution.
- Write code that makes proper use of exceptions and exception handling clauses (try, catch, finally) and declares methods and overriding methods that throw exceptions.

SECTION 3: GARBAGE COLLECTION

- State the behavior that is guaranteed by the garbage collection system, and write code that explicitly makes objects eligible for collection.

SECTION 4: LANGUAGE FUNDAMENTALS

- Identify correctly constructed source files, package declarations, import statements, class declarations (of all forms including inner classes), interface declarations and implementations (for java.lang.Runnable or other interface described in the test), method declarations (including the main method that is used to start execution of a class), variable declarations and identifiers.
- State the correspondence between index values in the argument array passed to a main method and command line arguments.
- Identify all Java programming language keywords and correctly constructed identifiers.
- State the effect of using a variable or array element of any kind when no explicit assignment has been made to it.
- State the range of all primitive data types and declare literal values for String and all primitive types using all permitted formats, bases, and representations.

SECTION 5: OPERATORS AND ASSIGNMENTS

- Determine the result of applying any operator, including assignment operators, instance of, and casts to operands of any type, class, scope, or accessibility, or any combination of these.
- Determine the result of applying the boolean equals (Object) method to objects of any combination of the classes java.lang.String, java.lang.Boolean, and java.lang.Object.
- In an expression involving the operators &, |, &&, ||, and variables of known values, state which operands are evaluated and the value of the expression.
- Determine the effect upon objects and primitive values of passing variables into

methods and performing assignments or other modifying operations in that method.

SECTION 6: OVERLOADING, OVERWRIDING, RUNTIME TYPE, AND OBJECT ORIENTATION

- State the benefits of encapsulation in object oriented design and write code that implements tightly encapsulated classes and the relationships "is a" and "has a".
- Write code to invoke overridden or overloaded methods and parental or overloaded constructors, and describe the effect of invoking these methods.
- Write code to construct instances of any concrete class including normal top level classes, inner classes, static inner classes, and anonymous inner classes.

SECTION 7: THREADS

- Write code to define, instantiate, and start new threads using both java.lang.Thread and java.lang.Runnable.
- Recognize conditions that might prevent a thread from executing.
- Write code using synchronized, wait, notify, or notifyAll, to protect against concurrent access problems and to communicate between threads.
- Define the interaction between threads and between threads and object locks when executing synchronized, wait, notify, or notifyAll.

SECTION 8: THE JAVA.AWT PACKAGE

- Write code using component, container, and LayoutManager classes of the java.awt package to present a Graphical User Interface with specified appearance and resize behavior, and distinguish the responsibilities of layout managers from those of containers.
- Write code to implement listener classes and methods, and in listener methods, extract information from the event to determine the affected component, mouse position, nature, and time of the event.
- State the event classname for any specified event listener interface in the java.awt.event package.

SECTION 9: THE JAVA.LANG PACKAGE

- Write code using the following methods of the java.lang.Math class: abs, ceil, floor, max, min, random, round, sin, cos, tan, and sqrt.
- Describe the significance of the immutability of string objects.

SECTION 10: THE JAVA. UTIL PACKAGE

- Make appropriate selection of collection classes/interfaces to suit specified behavior requirements.

SECTION 11: THE JAVA.IO PACKAGE

- Write code that uses objects of the file class to navigate a file system.
- Write code that uses objects of the classes InputStreamReader and outputStreamWriter to translate between Unicode and either platform default or ISO 8859-1 character encoding and distinguish between conditions under which platform default encoding conversion should be used and conditions under which a specific conversion should be used.
- Select valid constructor arguments for FilterInputStream and FilterOutputStream subclasses from a list of classes in the java.io.package.
- Write appropriate code to read, write and update files using FileInputStream, FileOutputStream, and RandomAccessFile objects.
- Describe the permanent effects on the file system of constructing and using FileInputStream, FileOutputStream, and RandomAccessFile objects.

1.2 Java 1.4 版的考试大纲

Sun Certified Programmer For Java [TM] 2 Platform 1.4
Exam Available August 19, 2002

SECTION 1: DECLARATIONS AND ACCESS CONTROL

- Write code that declares, constructs and initializes arrays of any base type using any of the permitted forms both for declaration and for initialization.
- Declare classes, nested classes, methods, instance variables, static variables and automatic (method local) variables making appropriate use of all permitted modifiers (such as public, final, static, abstract, etc.). State the significance of each of these modifiers both singly and in combination and state the effect of package relationships on declared items qualified by these modifiers.
- For a given class, determine if a default constructor will be created and if so state the prototype of that constructor.
- Identify legal return types for any method given the declarations of all related methods in this or parent classes.

SECTION 2: FLOW CONTROL, ASSERTIONS, AND EXCEPTION HANDLING

- Write code using if and switch statements and identify legal argument types for these statements.
- Write code using all forms of loops including labeled and unlabeled, use of break and continue, and state the values taken by loop control variables during and after loop execution.
- Write code that makes proper use of exceptions and exception handling clauses (try, catch, finally) and declares methods and overwriding methods that throw exceptions.
- Recognize the effect of an exception arising at a specified point in a code fragment. Note: The exception may be a runtime exception, a checked exception, or an error (the code may include try, catch, or finally clauses in any legitimate combination).
- Write code that makes proper use of assertions, and distinguish appropriate from inappropriate uses of assertions.
- Identify correct statements about the assertion mechanism.

SECTION 3: GARBAGE COLLECTION

- State the behavior that is guaranteed by the garbage collection system.
- Write code that explicitly makes objects eligible for garbage collection.
- Recognize the point in a piece of source code at which an object becomes eligible for garbage collection.

SECTION 4: LANGUAGE FUNDAMENTALS

- Identify correctly constructed package declarations, import statements, class declarations (of all forms including inner classes), interface declarations, method declarations (including the main method that is used to start execution of a class), variable declarations, and identifiers.
- Identify classes that correctly implement an interface where that interface is either java.lang.Runnable or a fully specified interface in the question.
- State the correspondence between index values in the argument array passed to a main method and command line arguments.
- Identify all Java programming language keywords. Note: There will not be any questions regarding esoteric distinctions between keywords and manifest constants.
- State the effect of using a variable or array element of any kind when no explicit assignment has been made to it.
- State the range of all primitive formats, data types and declare literal values for String and all primitive types using all permitted formats bases and representations.

SECTION 5: OPERATORS AND ASSIGNMENTS

- Determine the result of applying any operator (including assignment operators and instance of) to operands of any type class scope or accessibility or any combination of these.
- Determine the result of applying the boolean equals (Object) method to objects of any combination of the classes java.lang.String, java.lang.Boolean and java.lang.Object.
- In an expression involving the operators &, |, &&, || and variables of known values state which operands are evaluated and the value of the expression.
- Determine the effect upon objects and primitive values of passing variables into methods and performing assignments or other modifying operations in that method.

SECTION 6: OVERLOADING, OVERRIDING, RUNTIME TYPE AND OBJECT ORIENTATION

- State the benefits of encapsulation in object oriented design and write code that implements tightly encapsulated classes and the relationships "is a" and "has a".
- Write code to invoke overridden or overloaded methods and parental or overloaded constructors; and describe the effect of invoking these methods.
- Write code to construct instances of any concrete class including normal top level classes and nested classes.

SECTION 7: THREADS

- Write code to define, instantiate and start new threads using both java.lang.Thread and java.lang.Runnable.
- Recognize conditions that might prevent a thread from executing.
- Write code using synchronized wait, notify and notifyAll to protect against concurrent access problems and to communicate between threads.
- Define the interaction among threads and object locks when executing synchronized wait, notify or notifyAll.

SECTION 8: FUNDAMENTAL CLASSES IN THE JAVA.LANG PACKAGE

- Write code using the following methods of the java.lang.Math class: abs, ceil, floor, max, min, random, round, sin, cos, tan, sqrt.
- Describe the significance of the immutability of String objects.
- Describe the significance of wrapper classes, including making appropriate selections in the wrapper classes to suit specified behavior requirements, stating the result of executing a fragment of code that includes an instance of one of the wrapper classes,

and writing code using the following methods of the wrapper classes (e.g., Integer, Double, etc.):

- doubleValue
- floatValue
- intValue
- longValue
- parseXxx
- getXxx
- toString
- toHexString

SECTION 9: THE COLLECTIONS FRAMEWORK

- Make appropriate selection of collection classes/interfaces to suit specified behavior requirements.
- Distinguish between correct and incorrect implementations of hashcode methods.

1.3 考试注意事项

无论参加 SCJP 1.2 版的考试，还是参加 SCJP1.4 版的考试，都要到授权的考试中心进行考试，考试方式为计算机作答、计算机阅卷。其考试时间都是 2 个小时，共 59 道题。满分 100 分，答对 61%即为通过。

考试题型包括选择题、简答题。其中选择题有单选题和多选题，每个题目中的答案个数在问题中会指定，而简答题一般需要填写的内容都十分简单，例如，要求填写一个能够启动 JAVA 线程的函数的名字 start()。虽然要求考生填写的内容很少，但还是要很谨慎。当考生在填写这个函数时，有如下几种回答：

- start——只写函数的名字；
- start()——有函数的名字也有函数调用运算符“()”；
- start();——有函数的名字、括弧以及分号。

在实际的考试过程中，是采用计算机阅卷，那么以上的答案不可能都算正确。因此，在考试过程中，虽然试题要求填写的内容很简单，但是在填写时一定要注意填写方式。

SCJP 的考试与其他国际认证考试的不同之处在于，考生可以在考试过程中浏览和修改每一个答过的题目。如果考生能够在较短的时间内将全部试题答完，那么就可以利用剩余时间来检查题目的答案。

如果考生认为整个考试的答题都已经很满意，可以单击提交按钮，提前结束考试。如果考试时间已满，但是考生没有单击提交，那么系统会自动收回试卷。

无论是考生自己提交还是由系统强行收回考卷，考生在考试卷被收回以后都能够看到