

TigerTamer for Java 5

By Marcus Green

Concise guide to passing the Sun Certified Java Programmers Exam for Java 5 (JDK 1.5)

Copyright © 2005 may not be reproduced without permission.

Table of Contents

TigerTamer.....	7
Introduction.....	10
What does it mean to pass the SCJP Exam?	10
New Java new Exam	10
How To Study	12
Take mock Exams	12
Purchasing and Booking the exam.....	12
Actually Taking the Exam	13
The Lapel Badge.....	14
Which version of the exam?.....	14
How this book was created	16
Chapter 1) Declarations, Initialization and Scoping.....	17
Objective 1) Classes,interfaces, enums and packages.....	18
What is a class?.....	18
Comparing C++/VB classes with Java	18
The role of classes in Java.....	19
The simplest of class.....	19
Creating a simple HelloWorld class	19
Creating an instance of a class	20
Class and inner class declarations	21
Inner classes declared within methods	23
Field visibility for classes defined within a method	23
Creating an interface	24
Abstract Classes	24
The main method.....	24
Typesafe enums.....	25
Static Import	26
Objective 2) Interfaces and abstract classes	28
Creating an interface	28
Interfaces -Programming by contract.....	28
Objective 3) Declaring variables.....	31
Primitives variables.....	31
boolean and char	32
Instance and static variables.....	33
Automatic local variables	34
Arrays	35
Declaration without allocation	35
Simultaneous declaration and creation.....	36
Arrays know their own size	37
Java vs Visual Basic Arrays	37
Combined declaration and initialization	38
Default values of arrays.....	38

Objective 4) Methods and variable length arguments.....	40
Creating Methods	40
JavaBeans Names.....	41
Objective 5) Overriding and overloading.....	45
Covariant returns.....	45
Methods in the same class.....	45
Methods in a sub class	46
Objective 6) Constructors.....	48
What is a constructor?	48
When does Java supply the default constructor?	48
The prototype of the default constructor	49
Chapter 2) Flow Control	51
Objective 1) The if and switch statements.....	52
Switch statements	53
Legal arguments for if and switch statements	54
Objective 2) Loops and iterators.....	56
The new for loop	57
The while loops and do loops, nothing unexpected.....	58
The goto statement, science or religion?	59
Jump to a label	60
Objective 3) Assertions.....	62
Why Assertions exist.....	62
How assertions are used.....	62
What should you assert to be true?.....	63
Where should you use assertions?.....	63
Assert syntax.....	64
Objective 4) Exceptions.....	66
Comparing with Visual Basic and C/C++.....	66
Overriding methods that throw exceptions.....	67
The throws clause.....	67
Objective 5) Checked and unchecked exceptions.....	69
Checked and Unchecked Exceptions.....	69
The finally clause.....	70
Chapter 3) API Contents.....	73
Objective 1) Wrappers autoboxing and Strings.....	74
What are wrappers.....	74
AutoBoxing.....	74
String, StringBuilder, StringBuffer.....	75
The String Pool	76
Objective 2) Input and Output	78
File System Navigation.....	78
A program to navigate the file system.....	80
FileReader and FileWriter.....	82
Objective 3) Serializing Streams.....	84
The Serializable Interface.....	85
Objective 4) The text package and Locale.....	87
Formatting and using Locale.....	87
Objective 5) Regular expressions and formatting.....	90
What is a regular expression?.....	90
Quantifiers.....	90
Curly and curvy Braces {} and ().....	91
Whitespace \s.....	91
Character classes and [].....	92

Formatter.....	92
Scanner.....	93
Chapter 4) Concurrency	96
Objective 1) Instantiating and starting threads	97
What is a thread?	97
Platform dependence.....	97
The two ways of creating a thread	98
Instantiating and starting a Thread	99
Objective 2, Thread states.....	101
Thread states.....	101
Reasons a thread may be blocked	101
Using the Thread yield method.....	102
Java Thread Priorities.....	103
Objective 3) Object Locking.....	105
Note on this objective.....	105
The Mutex Lock	105
Relinquishing the lock.....	106
Objective 4, The wait/notify protocol	107
Why do you need the wait/notify protocol?	107
The synchronized keyword	108
wait/notify	109
Chapter 5) Object Oriented Concepts.....	112
Objective 1, Encapsulation.....	113
Comment on this objective.....	113
Encapsulation.....	113
Loose Coupling.....	114
Cohesion.....	114
Objective 2) Polymorphism	116
What does Polymorphism mean?.....	116
Runtime Type.....	116
Late Binding.....	117
Compiler vs. runtime errors.....	118
Performing a cast	119
Objective 3) Modifiers and inheritance.....	121
Private constructors.....	121
Protected.....	121
Static	123
Objective 4) Overriding and overloading	126
Comment on the objective	126
Overloading methods	126
Overriding and Covariant returns.....	127
Invoking base class constructors	128
Invoking constructors with this()	129
Constructors and the class hierarchy.....	130
Objective 5) Is-a Has-a relationships	131
"Is a" vs "has a" relationship.....	131
Chapter 6) The collection classes/interfaces	133
Objective 1) Selecting a collection class.....	134
What are collections?.....	134
The Collection hierarchy.....	134
A Set	134
A List	135
A Map	135

The Queue interface	135
Why use Collections instead of arrays?.....	136
Using Vectors	136
Using Hashtables	137
BitSet	137
The Comparable interface	138
Objective 2, implementing hashCode.....	139
Note on this Objective	139
It came from Object	139
equals(), hashCode and ==.....	140
When two objects are not equal.....	141
Objective 3) Generic Collection classes	143
What does refactor mean?.....	143
Before Generics.....	143
Type safe collections.....	144
Methods that take Generic type Collections.....	145
Objective 4) Using type parameters.....	147
What is a type parameter?.....	147
Using type parameters.....	148
Methods and return types.....	148
Type parameters are not assignment compatible.....	149
Bounded types.....	150
Wildcard types.....	151
Bounded Wildcards.....	152
Objective 5) Sorting and searching.....	154
The Collections helper class	154
The Collections sort method	154
Natural order and Comparable	155
Wrapper and String sorting	157
Comparator and Comparable.....	157
The Collections binarySearch method	158
Convert an array to a List	159
Chapter 7 Fundamentals.....	161
Objective 1) Access modifiers.....	162
Modifiers and encapsulation	162
Private.....	163
Public	164
Protected	165
Static.....	165
Native.....	167
Abstract	168
Final.....	169
Synchronized	169
Transient.....	170
Volatile.....	170
Using modifiers in combination.....	170
Access Modifiers and nested/inner classes	170
Where modifiers can be used	171
Objective 2, Passing command line values.....	172
Objective 3, Passing objects and primitives to methods.....	173
Note on the Objective.....	173
Object references as method parameters.....	173
Primitives as method parameters.....	174

Objective 4) Garbage collection.....	176
Why would you want to collect the garbage?	176
Java and garbage	176
Objective 5) Classes, packages and directories.....	180
The Package statement.....	180
Classpath	181
Jar files.....	182
Objective 6, Operators.....	184
Note on this objective.....	184
The short circuit effect with logical operators.....	189
Testing equality.....	190
The difference between equals and ==	190
Using the equals method with String	190
Using the equals method with Boolean	191
Using the equals method with Object	192