

Contents

Preface	ix
Notational Conventions	x
1 Running Java: Compilation, Loading, and Execution	2
2 Names and Reserved Names	2
3 Java Naming Conventions	2
4 Comments and Program Layout	2
5 Types	4
5.1 Primitive Types	4
5.2 Reference Types	4
5.3 Array Types	4
5.4 Boxing: Wrapping Primitive Types As Reference Types	4
5.5 Subtypes and Compatibility	6
5.6 Signatures and Subsumption	6
5.7 Type Conversion	6
6 Variables, Parameters, Fields, and Scope	8
6.1 Values Bound to Variables, Parameters, or Fields	8
6.2 Variable Declarations	8
6.3 Scope of Variables, Parameters, and Fields	8
7 Strings	10
7.1 String Formatting (Java 5.0)	12
8 Arrays	16
8.1 Array Creation and Access	16
8.2 Array Initializers	16
8.3 Multidimensional Arrays	18
8.4 The Utility Class Arrays	18
9 Classes	20
9.1 Class Declarations and Class Bodies	20
9.2 Top-Level Classes, Nested Classes, Member Classes, and Local Classes	20
9.3 Class Modifiers	20
9.4 The Class Modifiers <code>public</code> , <code>final</code> , <code>abstract</code>	22
9.5 Subclasses, Superclasses, Class Hierarchy, Inheritance, and Overriding	22
9.6 Field Declarations in Classes	24
9.7 The Member Access Modifiers <code>private</code> , <code>protected</code> , <code>public</code>	24
9.8 Method Declarations	26
9.9 Parameter Arrays and Variable-Arity Methods (Java 5.0)	28

9.10	Constructor Declarations	28
9.11	Nested Classes, Member Classes, Local Classes, and Inner Classes	30
9.12	Anonymous Classes	30
9.13	Initializer Blocks, Field Initializers, and Initializers	30
10	Classes and Objects in the Computer	32
10.1	What Is a Class?	32
10.2	What Is an Object?	32
10.3	Inner Objects	32
11	Expressions	34
11.1	Table of Expression Forms	34
11.2	Arithmetic Operators	36
11.3	Logical Operators	36
11.4	Bitwise Operators and Shift Operators	36
11.5	Assignment Expressions	38
11.6	Conditional Expressions	38
11.7	Object Creation Expressions	38
11.8	Instance Test Expressions	38
11.9	Field Access Expressions	40
11.10	The Current Object Reference <code>this</code>	40
11.11	Type Cast Expression	40
11.12	Method Call Expressions	42
12	Statements	46
12.1	Expression Statements	46
12.2	Block Statements	46
12.3	The Empty Statement	46
12.4	Choice Statements	48
12.5	Loop Statements	50
12.6	Returns, Labeled Statements, Exits, and Exceptions	54
12.7	The <code>assert</code> Statement	58
13	Interfaces	60
13.1	Interface Declarations	60
13.2	Classes Implementing Interfaces	60
14	Enum Types (Java 5.0)	62
15	Exceptions, Checked and Unchecked	64
16	Threads, Concurrent Execution, and Synchronization	66
16.1	Threads and Concurrent Execution	66
16.2	Locks and the <code>synchronized</code> Statement	68
16.3	Operations on Threads	70
16.4	Operations on Locked Objects	70

17	Compilation, Source Files, Class Names, and Class Files	72
18	Packages and Jar Files	72
19	Mathematical Functions	74
20	String Builders and String Buffers	76
21	Generic Types and Methods (Java 5.0)	78
21.1	Generics: Safety, Generality, and Efficiency	78
21.2	Generic Types, Type Parameters, and Type Instances	78
21.3	How Can Type Instances Be Used?	78
21.4	Generic Classes	80
21.5	Constraints on Type Parameters	82
21.6	How Can Type Parameters Be Used?	82
21.7	Generic Interfaces	84
21.8	Generic Methods	86
21.9	Wildcard Type Arguments	88
21.10	The Raw Type	90
21.11	The Implementation of Generic Types and Methods	90
22	Generic Collections and Maps (Java 5.0)	92
22.1	Interface Collection<T>	94
22.2	Interface List<T> and Implementations LinkedList<T> and ArrayList<T>	95
22.3	Interface Set<T> and Implementations HashSet<T> and LinkedHashSet<T>	96
22.4	Interface SortedSet<T> and Implementation TreeSet<T>	96
22.5	Interface Map<K,V> and Implementation HashMap<K,V>	98
22.6	Interface SortedMap<K,V> and Implementation TreeMap<K,V>	100
22.7	Going Through a Collection: Interfaces Iterator<T> and Iterable<T>	102
22.8	Equality, Hash Codes, and Comparison	104
22.9	The Utility Class Collections	106
22.10	Choosing the Right Collection Class or Map Class	108
23	Input and Output	110
23.1	Creating Streams from Other Streams	111
23.2	Kinds of Input and Output Methods	112
23.3	Imports, Exceptions, Thread Safety	112
23.4	Sequential Character Input: Readers	114
23.5	Sequential Character Output: Writers	115
23.6	Printing Primitive Data to a Character Stream: PrintWriter	116
23.7	The Appendable Interface and the CharSequence Interface	116
23.8	Reading Primitive Data from a Character Stream: StreamTokenizer	118
23.9	Sequential Byte Input: InputStream	120
23.10	Sequential Byte Output: OutputStream	121
23.11	Binary Input-Output of Primitive Data: DataInput and DataOutput	122
23.12	Serialization of Objects: ObjectInput and ObjectOutput	124
23.13	Buffered Input and Output	126

23.14	Random Access Files: RandomAccessFile	128
23.15	Files, Directories, and File Descriptors	130
23.16	Thread Communication: PipedInputStream and PipedOutputStream	130
23.17	Socket Communication	132
24	Reflection	134
24.1	Reflective Use of Types: The Class<T> Class	134
24.2	Reflection: The Field Class	136
24.3	Reflection: The Method Class and the Constructor<T> Class	136
24.4	Exceptions Thrown When Using Reflection	136
25	Metadata Annotations (Java 5.0)	138
26	What Is New in Java 5.0	140
	References	142
	Index	143