

Contents at a Glance



Introduction	1
Part I: Getting Started with Java	7
Chapter 1: All about Java	9
Chapter 2: All about Software	21
Chapter 3: Using the Basic Building Blocks.....	37
Part II: Writing Your Own Java Programs	59
Chapter 4: Making the Most of Variables and Their Values.....	61
Chapter 5: Controlling Program Flow with Decision-Making Statements.....	91
Chapter 6: Controlling Program Flow with Loops	121
Part III: Working with the Big Picture: Object-Oriented Programming.....	137
Chapter 7: Thinking in Terms of Classes and Objects	139
Chapter 8: Saving Time and Money: Reusing Existing Code.....	165
Chapter 9: Constructing New Objects.....	193
Part IV: Savvy Java Techniques	215
Chapter 10: Putting Variables and Methods Where They Belong	217
Chapter 11: Using Arrays to Juggle Values.....	245
Chapter 12: Using Collections and Streams (When Arrays Aren't Good Enough)	271
Chapter 13: Looking Good When Things Take Unexpected Turns.....	299
Chapter 14: Sharing Names among the Parts of a Java Program.....	327
Chapter 15: Responding to Keystrokes and Mouse Clicks	349
Chapter 16: Writing Java Applets	367
Chapter 17: Using Java Database Connectivity.....	377
Part V: The Part of Tens	385
Chapter 18: Ten Ways to Avoid Mistakes	387
Chapter 19: Ten Websites for Java	393
Index	395

Table of Contents



Introduction	1
How to Use This Book	1
Conventions Used in This Book	1
What You Don't Have to Read	2
Foolish Assumptions	3
How This Book Is Organized	4
Part I: Getting Started with Java	4
Part II: Writing Your Own Java Program	4
Part III: Working with the Big Picture: Object-Oriented Programming	4
Part IV: Savvy Java Techniques	5
Part V: The Part of Tens	5
Icons Used in This Book	5
Beyond the Book	6
Where to Go from Here	6

Part I: Getting Started with Java

Chapter 1: All about Java	9
What You Can Do with Java	10
Why You Should Use Java	11
Getting Perspective: Where Java Fits In	11
Object-Oriented Programming (OOP)	13
Object-oriented languages	14
Objects and their classes	14
What's so good about an object-oriented language?	16
Refining your understanding of classes and objects	18
What's Next?	20
Chapter 2: All about Software	21
Quick-Start Instructions	21
What You Install on Your Computer	23
What is a compiler?	24
What is a Java Virtual Machine?	26
Developing software	32
What is an Integrated Development Environment?	33

Chapter 3: Using the Basic Building Blocks 37

Speaking the Java Language.....	37
The grammar and the common names	38
The words in a Java program.....	39
Checking Out Java Code for the First Time.....	41
Understanding a Simple Java Program.....	42
The Java class	43
The Java method.....	44
The main method in a program	46
How you finally tell the computer to do something.....	47
Curly braces	50
And Now, a Few Comments.....	52
Adding comments to your code.....	53
What's Barry's excuse?	56
Using comments to experiment with your code.....	56

Part II: Writing Your Own Java Programs..... 59**Chapter 4: Making the Most of Variables and Their Values 61**

Varying a Variable	61
Assignment Statements	63
Understanding the Types of Values That Variables May Have	64
Displaying Text	68
Numbers without Decimal Points.....	68
Combining Declarations and Initializing Variables	70
The Atoms: Java's Primitive Types	71
The char type	72
The boolean type.....	74
The Molecules and Compounds: Reference Types	75
An Import Declaration	79
Creating New Values by Applying Operators	81
Initialize once, assign often	84
The increment and decrement operators	84
Assignment operators	88

Chapter 5: Controlling Program Flow with Decision-Making Statements 91

Making Decisions (Java if Statements)	92
Guess the number.....	92
She controlled keystrokes from the keyboard.....	93
Creating randomness	96
The if statement.....	96
The double equal sign.....	97
Brace yourself	98
Indenting if statements in your code.....	99
Elseless in Ifrica.....	99

Forming Conditions with Comparisons and Logical Operators	101
Comparing numbers; comparing characters	101
Comparing objects.....	102
Importing everything in one fell swoop	104
Java's logical operators	105
Vive les nuls!.....	108
(Conditions in parentheses).....	109
Building a Nest	111
Choosing among Many Alternatives (Java switch Statements).....	113
Your basic switch statement.....	113
To break or not to break.....	116
The new and improved switch.....	118

Chapter 6: Controlling Program Flow with Loops 121

Repeating Instructions Over and Over Again (Java while Statements)	122
Repeating a Certain Number of Times (Java for Statements).....	125
The anatomy of a for statement.....	127
The world premiere of "Al's All Wet"	127
Repeating Until You Get What You Want (Java do Statements)	129
Reading a single character	132
File handling in Java	133
Variable declarations and blocks	134

Part III: Working with the Big Picture: Object-Oriented Programming 137

Chapter 7: Thinking in Terms of Classes and Objects 139

Defining a Class (What It Means to Be an Account).....	139
Declaring variables and creating objects	141
Initializing a variable	144
Using an object's fields	144
One program; several classes	145
Public classes	145
Defining a Method within a Class (Displaying an Account)	146
An account that displays itself.....	147
The display method's header.....	148
Sending Values to and from Methods (Calculating Interest).....	149
Passing a value to a method.....	152
Returning a value from the getInterest method.....	154
Making Numbers Look Good.....	156
Hiding Details with Accessor Methods.....	159
Good programming.....	160
Public lives and private dreams: Making a field inaccessible.....	162
Enforcing rules with accessor methods.....	164

Chapter 8: Saving Time and Money: Reusing Existing Code	165
Defining a Class (What It Means to Be an Employee)	166
The last word on employees	166
Putting your class to good use.....	168
Cutting a check.....	169
Working with Disk Files (A Brief Detour)	170
Storing data in a file.....	171
Copying and pasting code	172
Reading from a file	173
Who moved my file?	175
Adding directory names to your filenames	176
Reading a line at a time	177
Closing the connection to a disk file	179
Defining Subclasses (What It Means to Be a Full-Time or Part-Time Employee)	179
Creating a subclass.....	181
Creating subclasses is habit-forming	183
Using Subclasses	184
Making types match	186
The second half of the story.....	187
Overriding Existing Methods (Changing the Payments for Some Employees).....	188
A Java annotation	190
Using methods from classes and subclasses	190
Chapter 9: Constructing New Objects	193
Defining Constructors (What It Means to Be a Temperature).....	194
What is a temperature?	194
What is a temperature scale? (Java's enum type).....	195
Okay, so then what is a temperature?.....	196
What you can do with a temperature.....	197
Calling new Temperature(32.0): A case study	200
Some things never change.....	202
More Subclasses (Doing Something about the Weather).....	203
Building better temperatures	203
Constructors for subclasses.....	205
Using all this stuff	206
The default constructor	207
A Constructor That Does More.....	209
Classes and methods from the Java API.....	212
The SuppressWarnings annotation	213

Part IV: Savvy Java Techniques 215**Chapter 10: Putting Variables and Methods Where They Belong 217**

Defining a Class (What It Means to Be a Baseball Player).....	217
Another way to beautify your numbers.....	219
Using the Player class	219
Nine, count 'em, nine.....	222
Don't get all GUI on me.....	222
Tossing an exception from method to method.....	224
Making Static (Finding the Team Average)	225
Why is there so much static?	226
Meet the static initializer	227
Displaying the overall team average	228
Static is old hat.....	231
Could cause static; handle with care	231
Experiments with Variables	232
Putting a variable in its place.....	233
Telling a variable where to go.....	236
Passing Parameters	238
Pass by value.....	239
Returning a result	240
Pass by reference.....	241
Returning an object from a method	243
Epilogue.....	244

Chapter 11: Using Arrays to Juggle Values 245

Getting Your Ducks All in a Row.....	245
Creating an array in two easy steps	247
Storing values	248
Tab stops and other special things	251
Using an array initializer	251
Stepping through an array with the enhanced for loop	252
Searching	254
Writing to a file.....	256
When to close a file.....	257
Arrays of Objects.....	259
Using the Room class	260
Yet another way to beautify your numbers	263
The conditional operator.....	264
Command Line Arguments	265
Using command line arguments in a Java program	266
Checking for the right number of command line arguments	268



Chapter 12: Using Collections and Streams (When Arrays Aren't Good Enough)	271
Understanding the Limitations of Arrays	271
Collection Classes to the Rescue.....	272
Using an ArrayList	273
Using generics	275
Testing for the presence of more data.....	277
Using an iterator	278
Java's many collection classes.....	279
New in Java 8: Functional Programming.....	280
Solving a problem the old-fashioned way.....	282
Streams.....	284
Lambda expressions.....	285
A taxonomy of lambda expressions	289
Using streams and lambda expressions	289
Why bother?	295
Method references.....	295
Chapter 13: Looking Good When Things Take Unexpected Turns	299
Handling Exceptions	300
The parameter in a catch clause.....	304
Exception types.....	305
Who's going to catch the exception?	307
The multi-catch clause	313
Throwing caution to the wind.....	314
Doing useful things	315
Our friends, the good exceptions	316
Handle an Exception or Pass the Buck	316
Finishing the Job with a finally Clause.....	322
A try Statement with Resources	324
Chapter 14: Sharing Names among the Parts of a Java Program	327
Access Modifiers.....	328
Classes, Access, and Multipart Programs	329
Members versus classes	329
Access modifiers for members	330
Putting a drawing on a frame	333
Directory structure.....	335
Making a frame	337
Sneaking Away from the Original Code	338
Default access.....	339
Crawling back into the package	342

Protected Access	343
Putting non-subclasses in the same package.....	345
Access Modifiers for Java Classes.....	346
Public classes	347
Nonpublic classes.....	347
Chapter 15: Responding to Keystrokes and Mouse Clicks	349
Go On . . . Click That Button.....	349
Events and event handling	352
The Java interface.....	352
Threads of execution.....	354
The keyword this	355
Inside the actionPerformed method	356
The serialVersionUID	357
Responding to Things Other Than Button Clicks.....	358
Creating Inner Classes	363
Chapter 16: Writing Java Applets.	367
Applets 101	367
Waiting to be called.....	369
A public class	369
The Java API (again).....	369
Making Things Move	370
The methods in an applet.....	372
What to put into all these methods	373
Responding to Events in an Applet	374
Chapter 17: Using Java Database Connectivity.	377
JDBC and Java DB.....	377
Creating Data.....	378
Using SQL commands.....	380
Connecting and disconnecting.....	381
Retrieving Data	382
<i>Part V: The Part of Tens</i>	<i>385</i>
Chapter 18: Ten Ways to Avoid Mistakes	387
Putting Capital Letters Where They Belong.....	387
Breaking Out of a switch Statement	388
Comparing Values with a Double Equal Sign	388
Adding Components to a GUI.....	389
Adding Listeners to Handle Events	389
Defining the Required Constructors	389

Fixing Non-Static References.....	390
Staying within Bounds in an Array.....	390
Anticipating Null Pointers	390
Helping Java Find Its Files	391
Chapter 19: Ten Websites for Java	393
This Book's Website.....	393
The Horse's Mouth.....	393
Finding News, Reviews, and Sample Code	394
Looking for Java Jobs.....	394
Everyone's Favorite Sites	394
 Index.....	 395