

Index

Symbols

- _ digit separator 50
- _ identifier 40
- , (comma) formatting flag
 163
- ! logical NOT 175, **178**
- != not equals 57
- ?: ternary conditional operator 101, 126
- { left brace 41
- } right brace 41
- * multiplication 53, 55
- *= (multiplication assignment operator) 123
- *= multiplication assignment operator 123
- / division 53, 55 /* */ traditional comment
- 39
 /** */ Java documentation
- /** */ Java documentation comment 39
- // end-of-line comment 39
- /= (division assignment operator) 123
- \ backslash escape sequence 46
- \" double-quote escape sequence 46
- \n newline escape sequence 45, 46
- \t horizontal tab escape sequence 46
- & boolean logical AND 175, 177
- **&&** conditional AND **176**, 177
- % remainder 53, 55
- %= (remainder assignment operator) 123

- %b format specifier 64, 179
- %c format specifier 67
- %d format specifier 51
- %f format specifier 67, 115
- %s format specifier 47
- ^ boolean logical exclusive OR 175, **178**
- + addition 53, 55
- (minus sign) formatting flag 163
- subtraction 53, 55
- -- predecrement/postdecrement 123
- ++ preincrement/postincrement 123
- += addition assignment operator 122
- < less than 57
- <= less than or equal 57
- -= (subtraction assignment operator) 123
- -=(subtraction assignment operator) 123
- == is equal to 57
- > greater than 57
- >= greater than or equal to 57
- | boolean logical inclusive OR 175, 177
- || conditional OR 175, **176**

A

- abbreviating assignment expressions 122 abstract method 40
- action 103
- action expression in the UML 93
- action state symbol in the UML 93

- action to execute 91 activity diagram 93
 - in the UML 103
- activity diagram (in the UML) **93**, 93, 97, 103, 183
- activity in the UML 93
- add method
 - BigDecimal 188
- add method of the BigInteger class 131
- adding Strings 64
- addition 53, 54
- addition compound assign
 - ment operator += 122
- algebraic notation 54
- algorithm 90, 105, 112
- API (application program-
- ming interface) 48 application 17
- argument to a method 42,
 - 63
- arithmetic calculation 53 arithmetic compound as-
- signment operators 122
- arithmetic operators 53
- arithmetic overflow 108 arrow
- in the UML 93
- assembler 9
- assembly language 9
- assert statement 40
- assignment operator 54, 122
 - ***=** 123
 - /= 123
 - **%=** 123
 - **-=** 123
 - = 52
- associativity of operators left to right 60
- attribute

of an object 11, 12	Bohm, C. 92	class declaration
automobile as an object 11	boolean logical AND & 175,	body 41
average 105, 108	177	.c1ass file 14 , 44
average calculation 112	boolean logical exclusive	class keyword 40 , 40
C	OR ^ 175, 178	class loader 15
В	boolean logical inclusive	classes
backslash (\) 45	OR 177	186
banker's rounding 189	boolean primitive type 40,	BigDecimal 116,164
bar chart 192	95	BigInteger class (pack-
behavior	braces ({ and }) 60, 100, 101	age java.math 128
of a class 11	not required 170	Long 130
big data 8	break statement 40, 170,	Scanner 49
BigDecimal class 116, 164,	173, 194	String 61 , 63
186 , 186	building block 90	CLASSPATH problem 18
add method 188	appearance 183	code 3 , 12
multiply method 188	building your own compil-	comma (,) formatting flag
ONE constant 188	er case study 9	163
pow method 188	byte 6	comma in an argument list
rounding policy 186 , 187	byte primitive type 40, 167	47
setScale method 189	bytecode 14, 43	comma-separated list 158
significant digits 186	bytecode verifier 15	of arguments 47
TEN constant 188	6	command line 42
TWO constant 188	C	Command Prompt 42
ZERO constant 188	calculations 93	command window 17, 42
BigInteger class 128	camel case 41	comment
add method 131	case keyword 40, 170	end-of-line (single-line),
divide method 137	case sensitive 41	// 39 , 42
mod method 137	Java commands 18	Javadoc 39
multiply method 131	cast operator 67, 115	single line 42
pow method 137	catch keyword 40	commission 133
subtract method 131	cd to change directories 43	compilation error 40, 43
value0f method 130	char	compile 43
binary digit (bit) 6	keyword 40	compile a program 14
binary integer 136	primitive type 50 , 167	compiler 10
binary number system 6	character 6	component 11
binary operator 51 , 54, 178	constant 172	compound assignment op-
binary search 22	set 6	erators 122 , 125
bit ("binary digit") 6	character set 67	compound interest 161,
Bitcoin 128	character string 42	192, 193, 194
bitwise operators 175	checkerboard pattern 67	Compound-Interest Pro-
blank line 40, 112	circumference 67	gram: Nested for Loops-
block 60 , 100	class 11	Triangle Printing
blockchain 128	declaration 40	Program
body	file 43	Nested for Loops 192
class declaration 41	instance variable 12	condition 57, 165
of a loop 103	name 40	conditional AND && 176,
of a method 42	class-average problem 105,	177
of an if statement 57	106, 113	conditional expression 102

conditional operator ?:	digit 6	double quotes, " 42, 45, 46
101, 126	decimal integer formatting	double selection 185
conditional OR 175, 176	C C	double-selection statement
const keyword 40	decision 57, 96	94 , 118
constant 172	symbol in the UML 96	driver program 62
Math.PI 67	declaration	2 0
constant integral expression	class 40	E
167 , 172	import 49	Eclipse (www.eclipse.org)
constant variable 172	method 42	14
contextual keywords 40	decrement a control vari-	Eclipse IDE for Java De-
continue statement 40, 173,	able 158	velopers 3
174 , 175, 194	decrement operator 123	edit a program 14
control statement 91, 93, 94,	decrypt 199	editor 13
96	deeply nested statement 184	e1se keyword 40, 97
for 157	default case in a switch	emacs 14
nesting 95 , 184	170 , 171, 172	employee identification
stacking 95 , 183	default keyword 40	number 7
control statement stacking	definite iteration 105	empty statement (a semico-
114	dependent condition 177	lon, ;) 60, 101, 158
control variable 105, 154,	design process 13	empty String 63
155, 157	diameter 67	encapsulation 12
controlling expression of a	diamond in the UML 93,	encryption 198
switch 170	193	"end of data entry" 110
core package 44	decision symbol 96	end-of-file (EOF)
correct in a mathematical	merge symbol 103	indicator 169
sense 181	digit 50	end-of-line (single-line)
counter 105 , 106, 111, 118	digit separator (_) 50	comment, // 39 , 42
counter-controlled itera-	display a line of text 42	endsWith method of class
tion 105 , 106, 114, 117,	divide by zero 16, 112	String 64
118, 154, 155, 156	divide method of the	Enforcing Privacy with
counting loop 155	BigInteger class 137	Cryptography exercise
credit limit on a charge ac-	division 53, 54	198
count 132	compound assignment	English-like abbreviations 9
cryptocurrency 128	operator, /= 123	Enter (or Return) key 42
Ctrl key 169	dowhile iteration state-	entry point of a control
< <i>Ctrl>-d</i> 169	ment 94	statement 95, 181
< <i>Ctrl>-z</i> 169	dowhile repetition state-	enum
cursor 42, 45	ment 40, 165 , 185	keyword 40
custom precision for for-	document a program 39	environment variable
matted floating-point	dollar signs (\$) 41, 49	PATH 14
values 115	dot (.) separator 130, 163	equality operators 57
_	dot operator (.) 63	equals method of class
D	dotted line in the UML 94	string <mark>64</mark>
dangling-e1se problem 134	(double) cast 115	escape character 45
data hierarchy 5	double-precision floating-	escape sequence 45, 50
data mining 8	point number 112	\ backslash 46
database 7	double primitive type 40,	\" double-quote 46
decimal	50 , 112	\n newline 45, 46

it 132

\t horizontal tab 46 Factorial 137 exit point 181 Factorials 191 execute **16**, 43 of a control statement 95 executing an application 18 Find the Largest Numexiting a for statement 173 execution-time error 16 ber 133 explicit conversion 115 Find the Smallest Value Exercises exponentiation operator Another Dangling-else 163 Find the Two Largest Problem 135 exports keyword 40 Numbers 133 expression 51 Arithmetic 66 Gas Mileage 132 extends keyword 40 Arithmetic, Smallest and Integer Value of a Char-Largest 66 F acter 67 Bar-Chart Printing Pro-Largest and Smallest Infactorial 137, 191 gram 192 BigInteger class: Other tegers 66 fair rounding algorithm 186 arithmetic operations Multiples 66 false keyword 57, 95 Odd or Even 66 137 fatal error 101 Palindromes 136 Calculating Sales 192 fatal logic error 101 Calculating the Product Peter Minuit problem runtime error 16 of Three Integers 66 194 fault tolerant 50 Powers of 2 137 Calculating the Value of field **7**, 7 $\pi 193$ Printing the Decimal field width 163 Checkerboard Pattern of Equivalent of a Binary file 7 Asterisks 67, 136 Number 136 final Product of Odd Integers Comparing Integers 66 keyword 40, 172 Compound-Interest 191 final state in the UML 94, Program (modified) Pythagorean Triples 193 183 193 Removing break and final value 155 continue 194 Compound-Interest finally Program: Nested for Salary Calculator 133 clause 40 Sales Commission Cal-Loops 192 first refinement in top-Compound-Interest culator 133 down, stepwise refine-Program: Solving Separating the Digits in ment 110, 118 without Math.pow 192 fixed text 51 an Integer 68 Dangling-e1se Problem Sides of a Right Triangle in a format string 47 134 flag value 110 Sides of a Triangle 137 De Morgan's Laws 193 float Diameter, Circumfer-Square of Asterisks 136 primitive type 40, **50**, 112 ence and Area of a Cir-Table of Squares and floating-point literal 113 cle 67 Cubes 68 double by default 113 Diamond-Printing Pro-Tabular Output 133 floating-point number 108, "The Twelve Days of gram 193 112, 114, 115 Diamond-Printing Pro-Christmas" Song 194 division 115 gram (modified) 194 Triangle-Printing Prodouble precision 112 Displaying Data 66 gram (modified) 192 single precision 112 Validating User Input Displaying Integers 191 Displaying Shapes with 134 %f format specifier 115 Asterisks 66 What Does This Code floating-point value Do? 191 Exceeding a Credit Limcustom precision for for-

Write a Line of Code 65

matting 115

G	identifier 41, 49
general class average prob-	if single-selection state-
0 2	ment 40, 57 , 94, 96, 185
	ife1se double-selection
•	statement 94, 97 , 97, 114,
	185
	implements 40
	implicit conversion 115
	import declaration 40, 49
	increment 158
C	a control variable 155
goto	expression 174
elimination 92	of a for statement 158
keyword 40	increment a control vari-
statement 92	able 154
goto elimination 92	indentation 97, 99
graph 192	infinite loop 103 , 158, 160
gross pay 133	infinite series 193
group	information hiding 12
left to right 126	inheritance 12
C	initial state 183
	initial state in the UML 93
	initial value of control vari-
	able 154
	initialization phase 110
	initialize a variable in a dec-
	laration 49
	input/output operation 93
UMIL 96	instance 11
н	instance main 41
	instance variable 12
•	instanceof operator 40
	int data type 123
	int primitive type 40, 50 ,
	integer 48 division 108
	quotient 54
	super-sized 127
	value 50
TTT TTO Protocol 120	integer division 54
I	integral expression 172
IDF (integrated develop-	integrated development en-
_	vironment (IDE) 14
	IntelliJ IDEA (www.jet-
	brains.com) 14
	interest on deposit 194
	interest rate 162
	general class average prob- lem 110 generative AI 43, 44, 46, 48, 52, 57, 61, 92, 96, 98, 100, 101, 102, 105, 110, 117, 122, 123, 127, 144, 156, 159, 160, 161, 165, 167, 173, 175, 181, 190 Global Warming Facts Quiz exercise 202 goto elimination 92 keyword 40 statement 92 goto elimination 92 graph 192 gross pay 133 group

interface keyword 40 interpreter 10 isEmpty member function of String 64 iteration 107 counter controlled 117, 118 definite 105 of a loop 103, 154, 174 sentinel controlled 110, 111, 113 iteration statement 93, 94, 94, 102, 111 dowhile 94 for 94 while 94, 102, 107	Java Standard Edition 22 (Java SE 22) 5 Java Virtual Machine (JVM) 14, 17 java.lang package 50, 63 java.math package 116, 187 BigInteger class 128 java.util package 49 javac compiler 14, 43 Javadoc comment 39 javadoc utility program 39 JDK 13, 43 JetBrains IntelliJ IDEA 3 just-in-time (JIT) compiler 16	L L for long integer literal 130 label in a switch 170 left align output 163 left brace { 41, 42 left-to-right evaluation 56 length method of class string 63 letter 6 level of indentation 97 lexicographical comparison 64 Linux operating system 42 literals floating point 113 loading 15
, , , , , , , , , , , , , , , , , , ,	JVM (Java Virtual Ma-	local variable 107 , 107
J Jacopini, G. 92 Java API documentation 51 String class 61, 63 Java API (Application Programming Interface 38 Java Application Programming Interface (Java API) 48 java command 15, 17, 18 Java compiler 14 Java Development Kit (JDK) 43 Java Enterprise Edition (Java EE) 5 . java extension 14 Java HotSpot compiler 16 java interpreter 43 Java Language Specification 55 Java Micro Edition (Java ME) 5 Java SE 22 (Java Standard	JVM (Java Virtual Machine) 14 K keyboard 48 keywords 40, 94 break 170 case 170 char 50 class 40 contextual 40 continue 174 default 170, 171 do 94, 165 double 50, 112 else 94 false 95, 97 final 172 float 50, 112 for 94, 156 if 94 import 49 int 50 new 49 public 40 reserved but not used by Java 40	e e e e e e e e e e e e e e e e e e e
Edition 22) 5 Java SE 8 Development Kit (JDK) 13	static 130 switch 94 true 95 , 97	lowercase letter 7, 40
Java Standard Edition (Java SE) 5	void 41 while 94, 165	machine dependent 9 machine language 9

programming 9	Examination-results	OOAD (object-oriented
macOS 42	problem 120	analysis and design) 13
main method 41, 42	nested ifelse selection	OOP (object-oriented pro-
instance main 41	statement 98, 135	gramming) 13
Math class 163	nested parentheses 54	opens keyword 40
pow method 163 , 163	nesting rule 184	operand 51 , 115
Math.PI constant 67	NetBeans (www.net-	operator 52
MAX_VALUE constant	beans.org) 14	operator precedence 54
Long class 130	new keyword 40, 49	rules 54
memory location 52	new Scanner(System.in)	Operators
method 11, 41	expression 49	?: ternary conditional
argument 42 , 63	newline character 45	operator 101, 126
call 12	newline escape sequence \n 45, 46	boolean logical exclusive OR ^ 178
static 130 Microsoft Windows 169	nonfatal logic error 101	
	nonfatal runtime error 16	operators
mileage obtained by auto-	non-sealed keyword 40	predecrement/post-
mobiles 132	Notepad 14	decrement 123
minus sign (-) formatting	notes (in the UML) 94	prefix decrement/
flag 163	notes (iii the OML) 94	postfix decrement 124
mobile application 4	0	! logical NOT 175, 178
mod method of the BigIn-		?: ternary conditional
teger class 137	object 4	operator 101, 126
module keyword 40	of a class 11, 12	*= multiplication assign-
monetary calculations 164	object oriented	ment operator 123
BigDecimal class 186, 186	analysis and design (OOAD) 13	/= (division assignment) 123
multiline string (text block)	programming (OOP) 13	/= division assignment
42, 169	object-oriented program-	operator 123
multiple-selection state-	ming (OOP) 4	& boolean logical AND
ment 94	Objects-Natural Approach	175, 177
multiplication	3, 38	&& conditional AND
* 54 , 54	Objects Natural Case Study	176, 177
compound assignment	Precise Monetary Calcu-	%= remainder assign-
operator, *= 123	lations with Java API	ment operator 123
multiply method of class	Class BigDecimal 186	^ boolean logical exclu-
BigDecimal 188	Super-Sized Integers 127	sive OR 175, 178
multiply method of the	objects-natural case study	++ prefix increment/
BigInteger class 131	Creating and Using Ob-	postfix increment 124
N	jects of Standard-Li-	++ preincrement/postin-
	brary Class string 61	crement 123
%n format specifier (line	objects-natural approach	+= addition assignment
separator) 47	38, 128, 129	operator 122
name of a variable 49, 52	Objects-Natural Case	= 52
native keyword 40	Study 61, 116	-= subtraction assign-
nested building block 185	off-by-one error 157	ment operator 123
nested control statements	ONE constant of class Big-	-= (subtraction assign-
117 , 184, 185	Decimal 188	ment) 123

boolean logical inclu-	Packages	prefix decrement operator
sive OR 175, 177	java.lang 50 , 63	124
conditional OR 175,	java.math 116, 187	prefix increment operator
176	java.util <mark>49</mark>	124
arithmetic 53	pair of braces {} 60	preincrement 125
binary 51 , 54	palindrome 136	Preincrementing and post-
boolean logical AND &	parentheses 41, 54	incrementing 124
175 , 177	nested 54	primitive type 50
boolean logical exclusive	redundant 56	boolean 95
OR ^ 175, 178	parentheses to force order	byte 167
boolean logical inclusive	of evaluation 126	char 50, 167
OR 177	PATH environment variable	double 50 , 112
cast 115	14	float 50 , 112
compound assignment	pattern of 1s and 0s 6	int 50, 51, 167
122, 125	perform an action 42	long 128, 167
conditional AND &&	permits keyword 40	short 167
176 , 177	Peter Minuit exercise 194	principal in an interest cal-
conditional operator ?:	phase 110	culation 162, 194
101 , 126	"pick off" each digit 68	print method of Sys-
conditional OR 175,	platform independent 15	tem.out 45
176 , 177	polymorphism 172	print on multiple lines 44
decrement operator	polynomial 56	print on multiple lines 44 printf method of Sys-
123, 124	portable 15	tem.out 46
dot (.) 63	postfix decrement operator	println method of Sys-
logical AND, && 177	124	tem.out 42, 45
logical complement!	postfix increment operator	privacy 127
178	124	private
logical negation! 178	postincrement 125	keyword 40
logical operators 175,	pow method of class Big-	•
178, 179	Decimal 188	procedure for solving a
multiplication * 54	pow method of class Math	problem 90
postfix decrement 124	163 , 163	processing phase 110
postfix increment 124	pow method of the BigIn-	product of odd integers 191
prefix decrement 124	teger class 137	program control 91
prefix increment 124	power of 2 larger than 100	program development tool
remainder 136	102	112
remainder % 54 , 54	precedence 54 , 60, 125	promotion 115
subtraction - 54	chart 55, 126	rules 115
optimizing compiler 163	precise monetary calcula-	prompt message 49
order 92	tions 186	protected access modifier
order in which actions	BigDecimal class 186,	40
should execute 91	186	provides keyword 40
output 42	precision	pseudocode 91 , 97, 117
output cursor 42, 45	BigDecimal 186	first refinement 110, 118
D	format of a floating-	second refinement 111,
P	point number 115	119
package 48	precision for formatted	public
package keyword 40	floating-point values 115	keyword 40 , 40

9

public-key cryptography 128	fair rounding algorithm 186	sequence structure 93
120	half even 189	sequential execution 92 setScale method of class
R	policy of a BigDecimal	BigDecimal 189
range checking 109	186 , 187	shell 42
readability 39, 119	policy Rounding-	shopping list 102
real number 50	Mode.HALF_EVEN 189	short-circuit evaluation 177
record 7	round half to even 189	short primitive type 40,
redundant parentheses 51, 56	rounding a number 108, 164	167 side effect 1 77
refinement process 110	RoundingMode.HALF_EVEN	signal value 110
reinventing the wheel 48, 186	rounding policy 189 RSA Public-Key Cryptog-	significant digits of a Big- Decimal 186
relational database 7	raphy algorithm 128	simple condition 175
relational operators 57	rules of operator prece-	simplest activity diagram
remainder 54	dence 54	183
remainder compound as- signment operator, %= 123	running an application 18 running total 111 runtime error 16	single-entry/single-exit control statements 95 , 181, 183
remainder operator % 54 , 54,		single-line (end-of-line)
136	S	comment 42
repetition 185	savings account 162	single-precision floating-
counter controlled 114	Scanner class 49, 49	point number 112
sentinel controlled 114	hasNext method 170	single-selection statement
repetition statement 94	scope of a variable 158	94 , 96, 185
dowhile 165, 185, 185	screen cursor 46	if 96
for 185	sealed keyword 40	size of a variable 52
while 114, 155, 185	second-degree polynomial	small circles in the UML 93
representational error 186, 187	56	smallest of several integers 191
~	second refinement in top-	smartphone 4
in floating point 164 requirements 13	down, stepwise refine- ment 119	software 2
requires keyword 40	security 15, 127	software engineering
return keyword 40	selection 94, 185	reuse 63
reusable software compo-	selection statement 93, 94 ,	solid circle
nents 11	111	in the UML 93
reuse 12, 48, 63	if 94, 96, 185	surrounded by a hollow
right align output 163	ifelse 94, 97 , 97, 114,	circle in the UML 93
right brace (}) 41, 42, 107,	185	source code 10, 14
114	switch 94, 167 , 171, 185	space character 40
rise-and-shine algorithm 91	self-documenting code 49	special character 50
robust 50	semicolon (;) 42 , 49, 60	special symbol 6
round a floating-point	send a message to an object	stack control statements
number for display pur-	12	114
poses 115	sentinel-controlled itera-	stacked building blocks 185
round half to even 189	tion 111, 113, 114, 193	stacking control statements
rounding 54 banker's 189	sentinel value 110 , 111, 114	185 stacking rule 184
Dalikei 8 107	sequence 94, 185	stacking rule 184

standard input stream (System.in) 49 standard library class string 62 standard output stream (System.out) 42 startsWith method of class String 64 statement 42, 111 break 170, 173, 194 continue 174, 175, 194 control statement 91, 93, 94, 96 control-statement nesting 95 control-statement stacking 95 dowhile 94, 165, 185 double selection 94, 118 empty 60, 101 for 94, 156, 163, 185 if 57, 94, 96, 185 ifelse 94, 97, 97, 114, 185 iteration 93, 94, 102 looping 94 multiple selection 94 nested 117 nested ifelse 98, 135 selection 93, 94 single selection 94 switch 94, 167, 171, 185 while 94, 102, 107, 114, 155, 185 static	String concatenation 64 string literal 63 structured programming 92, 154, 174, 183, 184, 185 summary 181 subtract method of the BigInteger class 131 subtraction 53 operator - 54 subtraction compound assignment operator, -= 123 super keyword 40 super-sized integers 90, 127 switch logic 172 switch multiple-selection statement 40, 94, 167, 171, 185 case label 170, 171 controlling expression 170 default case 170, 171, 172 synchronized keyword 40 syntax error 40 System.out 42 print method 45 printf method 46 println method 46 println method 42, 42, 45 T tab character \t 46 Tab key 41	text editor 42 TextEdit 14 The "FairTax" 202 The Java Language Specification 55 this keyword 40 throw keyword 40 top 110 top-down, stepwise refinement 110, 111, 112, 118, 119 total 106, 111 traditional comment 39 transfer of control 92 transient keyword 40 transition arrow in the UML 93, 97, 104 transitive keyword 40 translation 9 true 95 true reserved word 57, 97 truncate 54 truncate fractional part of a calculation 108 truth tables for operator \ 178 for operator 177 truth tables for logical operators 176 try keyword 40
keyword 40 method 130 straight-line form 54 strictfp keyword 40 string 42 literal 42 of characters 42 String class 61, 63 endtsWith method 64 equals method 64 isEmpty method 64 length method 63	tab stops 46 Tax Plan Alternatives exercise 202 temporary 115 TEN constant of class Big-Decimal 188 terminal (window) 42 terminate a loop 111 termination phase 110 ternary operator 101 text block 42 text block (multiline string)	TWO constant of class Big- Decimal 188 two largest values 133 type 49 type casting 115 type of a variable 49, 52 U UML activity diagram 93, 93, 97, 103, 183 UML (Unified Modeling
startsWith method 64	42, 169	Language) 13

activity diagram 93 , 93, 97, 165 arrow 93	W when keyword 40 while iteration statement
diamond 96 dotted line 94 final state 94	94, 102 , 107, 114 while repetition statement 40, 155, 185
guard condition 96 merge symbol 103 note 94 solid circle 93 solid circle surrounded by a hollow circle 93 UML (www.uml.org) 94 unary operator 178 cast 115 underscore in numbers for readability 50 underscores 50 Unicode character set 6, 67, 127, 172 Unified Modeling Language (UML) 13 uppercase letter 41 uses keyword 40	whitespace 40, 42, 60 Windows operating system 169 with keyword 40 workflow 93 y yield keyword 40 Z zero-based counting 157 ZERO constant of class Big-Decimal 188
v	
valid identifier 49 validate data 109 value of a variable 52 value0f method of class BigInteger 130 var keyword 40 variable 48, 49, 49 name 49, 52 size 52 type 49, 52 value 52 variable declaration statement 49 variable scope 158 vi editor 14 virtual machine (VM) 14 Visual Studio Code 3 void keyword 40, 41 volatile keyword 40	