

Index

&&, 36, 143, 152
' , 37
\ , 6, 18, 26, 37, 367
\\ , 19
\" , 18
\n , 19, 20, 60
\t , 19
^ , 8
^D , 280
{ } , 9, 11
 omission, 149, 157
/ , 39
" , 10, 18
= , 33
++ , 325
== , 145, 146
!= , 145, 146
! , 36, 143
/ , 6, 26, 367
// , 11
/* , 12
/** , 12
> , 146, 342
>= , 146
< , 4, 146, 342
<= , 146
- , 39
-= , 51
- , 51
% , 4, 10, 40
%c , 147, 214, 308
%d , 147, 214, 308
%e , 147, 491
%= , 51
%f , 147, 216
%n , 147, 211
%% , 211
%s , 147, 212, 229
., 367
.class , 6
.java , 6
.. , 6, 367
+ , 39, 59, 214
+= , 51, 62
++ , 51
; , 10, 32, 342

/= , 51
[] , 295
*/ , 12
* , 39
*= , 51
_ , 21
| , 21, 213, 342
|| , 36, 143
3x + 1 Problem, 270

A

ABC Song, 15
abs , 125
abstract class, 7
accessor, 396
Adventures of Huckleberry Finn, 19, 254
algorithm, 179
 greedy, 234
 online, 485
 recursive, 492
Alma Mater, 25
America the Beautiful, 385
approximation, 489
args , 9, 342, 376, 429, 501
arithmetic, 37, 82
arithmetic operation, 39
ArithmeticException, 163
array, 295
 diagonal, 365
 index of an element in, 295
 initialization of elements, 303
 instantiation of, 295
 irregularly shaped, 358
 jagged, 358, 379
 length of, 295, 296
 multi-dimensional, 357
 rectangular, 358, 365
 regularly shaped, 358
 reordering in place, 329
 reversing element order, 332
 size of, 295
 slot of, 296
 square, 358, 365
 swapping elements, 329
 upper-triangular, 365

- array (*cont.*)
 - with capacity and size, 345
- ArrayIndexOutOfBoundsException, 303
- ArrayList, 459
 - add, 460
 - clear, 460
 - get, 460
 - remove, 460
 - set, 460
 - size, 460
- Arrays, 228, 325, 342
 - copyOf, 325, 342, 382, 432, 438
 - equals, 325
 - fill, 325
 - sort, 228, 325, 326, 353, 447, 449, 462
- ASCII, 307, 389, 390
- assert, 384
- AssertionError, 385
- assignment, 33
- auto-boxing, 446
- auto-unboxing, 446
- Autumn*, 16
- average, 151, 178, 388, 420

- B**
- bank account, 408, 454
- baritone, 340
- baseball, 140
- bass-baritone, 340
- Beamer, vii
- Beatles, 108
- Becket, Samuel Barclay, 277
- betting, 264
- bin, 296
- binary search, 283, 344
- Bingo, 366
- Birthday Paradox, 321, 322
- bit, 29
- black box, 402
- BMI, *see* Body-Mass Index
- Body-Mass Index, 46, 119, 173, 207, 224, 290, 306
- Boole, George, 143
- Boolean, 446
- boolean, 29, 35, 143, 446
- boundary, 289, 399
- Brackeen, Joanne, 345
- Brady, Thomas Edward Patrick, Jr., 31
- break, 199, 245, 276
- bridge, 108
- Byte, 446
- byte, 29, 35, 36, 446
- bytecode, 3

- car, 419, 453
- Carrington, Terri Lyne, 345
- case, 245
- casting, 46, 63, 126, 445
- cat, 6
- catch, 371
- cd, 4, 6
- char, 29, 35, 37, 245, 404, 446
- Character, 446
- character space allocation, 212, 214
- chdir, 6
- Chess, 398
- Children*, 25
- circle, 41, 208
 - area of, 41
 - perimeter of, 41
- class, 7
 - declaration, 69
 - object, 30, 225
- class file, 6
- cmd, 3
- Collatz Conjecture, 270, 482
- Collatz, Lothar, 270
- Collection, 474
 - contains, 477
 - size, 477
- Collections, 462
 - sort, 462, 463, 471
- collision, 476
- combinatorial number, *see* number, combinatorial
- command, 3, 6
- command line interface, 3, 342
 - window size, 59
- comment, 11, 178
 - Javadoc, 12
 - multiple-line, 12
- Comparable, 447, 454, 457
 - compareTo, 146, 447, 458, 462
 - equals, 146
- Comparator, 458, 483, 484
 - compare, 459, 463
- compilation, 3, 6, 13
- compiler, 11
- complex number, *see* number, complex
- composite number, *see* number, composite
- concatenation, 59, 237
 - conversion to String, 61
- condition, 143
 - continuation, 263, 297
 - termination, 276
- conditional evaluation, 143
 - combination with assignment, 163
 - truncation, 162
- conjunction, 36, 143, 144
- constant, 29, 34, 42, 391
 - global, 34, 44
 - local, 34
- constructor, 56, 70, 193, 237, 391
- continue, 199
- coordinate, 138, 288, 322, 391

- Cartesian, 138
 - polar, 138
- copy, 6
- countdown, 182
- cp, 6
- CTRL-D, 74, 279
- currency punctuation, 214
- cyclic shift, 241, 332
 - left, 332
 - right, 332
- cylinder, 138

- D**
- data, 29
- data type, 29
 - boxed, 446
 - generic, 448, 458
 - object, 29, 56, 325, 326
 - primitive, 29, 56, 325, 326
 - range of, 35
- date, 454
- De Morgan's laws, 144
- De Morgan, Augustus, 144
- Dearie, Blossom, 345
- declaration, 32
 - combination with an assignment, 33
 - multiple variables, 32
 - variable, 32, 47
- default, 245
- del, 6
- delimiter, 69, 76
- Denver Broncos, 31
- depth, 9, 32, 89
- Deque, 475
 - offerFirst, 476
 - offerLast, 476
 - peekFirst, 476
 - peekLast, 476
 - pollFirst, 476
 - pollLast, 476
- determinant, 168
- diamond, 25, 204
- die, 107, 195, 300
- digit, 108
- dir, 6
- discriminant, 166
- disjunction, 36, 143, 144
- divisible, 166, 310
- divisor, 310
- do-while loop, 173, 276, 303, 315, 340
- dog, 453
- Double, 446
 - parseDouble, 382, 431
- double, 29, 35, 36, 446
- down-casting, 445
- Drougas, Paul, vii

- E**
- e, 124
- echo, 3, 77, 280
- Eclipse, 4, 13
- election, 355
- emacs, 3
- enum, 7
- enumeration, 242–244
- equality, 145
- equation, 131
 - linear, 168, 420
 - quadratic, 83, 138
- error, 4, 6
 - compilation, 18
 - logic, 14
 - run-time, 14, 103, 193, 370
 - syntax, 13
- error message, 193
- escaping, 19, 24, 37, 211
 - backslash, 19
 - newline, 19
 - tab-stop, 19
- Euclid, 497
- Euclidean distance, 139
- Exception, 370, 446
- exponent, 36
- expression
 - simplified, 51
- extends, 435

- F**
- factorial, 185, 208, 489, 493
- false, 35
- Fifteen Puzzle, 421
- File, 367, 462, 483
 - canExecute, 368, 376
 - canRead, 368, 376
 - canWrite, 368, 376
 - createNewFile, 368
 - delete, 368
 - exists, 368
 - getAbsoluteFile, 368
 - getAbsolutePath, 368
 - getCanonicalFile, 368
 - getCanonicalPath, 368
 - getName, 368
 - getParent, 368
 - getParentFile, 368
 - isDirectory, 368, 376
 - isFile, 368, 376
 - length, 368
 - listFiles, 368
 - mkdir, 368
 - renameTo, 368
- FileNotFoundException, 378, 384, 430, 431, 446, 462

- final, 42, 43
 - final, 34
 - fine, 66, 85
 - Fischer-Dieskau, Dietrich, 340
 - flag, 314
 - Fleming, Renée, 340
 - Float, 446
 - float, 29, 35, 36, 446
 - floating point number, 45
 - floating point representation, 36
 - flush left, 212, 214
 - flush right, 212, 214
 - folder, 367, *see* directory
 - separator of, 6
 - working, 4
 - foot, 121
 - for-each loop, 173, 439, 460, 462, 474, 477
 - for-loop, 173
 - continuation condition, 175
 - double, 187
 - initialization of, 175
 - iteration variable declaration in the initialization, 178
 - termination, 177
 - termination condition, 175
 - update, 175
 - format
 - tab-delimited, 381
 - format String, 147
 - fraction, 85
 - function
 - trigonometric, 130
- G**
- game, 391
 - betting, 195
 - board, 391
 - guessing, 289
 - piece of, 391
 - Gauss, Johann Carl Friedrich, 48, 184
 - GCD, *see* greatest common divisor
 - getter, 396, 461
 - Gettysburg Address*, 60
 - global variable, *see* variable, global
 - gravity, 66, 83, 140
 - greatest common divisor, 497, 504
 - Gregorian calendar, 454
 - grid, 260
 - three-dimensional, 260
 - two-dimensional, 260, 288
- H**
- Hanoi, 500
 - hash function, 476
 - hash table, 476
 - HashSet, 475, 476
 - add, 476
 - clear, 476
 - contains, 476
 - isEmpty, 476
 - remove, 476
 - size, 476
 - heldentenor, 340
 - Heppner, Thomas Bernard, 340
 - Heron's Formula, 290
 - hexadecimal encoding, 36
 - histogram, 297
 - cumulative, 299
 - noncumulative, 299
- I**
- I Want To Hold Your Hand*, 108
 - IDE, *see* interactive development environemtn
 - if-else statement, 156, 247
 - if-statement, 149
 - IllegalArgumentException, 193, 385, 454
 - IllegalFormatConversionException, 211
 - implements, 427, 457
 - import, 69, 367
 - inch, 121
 - indentation, 11
 - index, 296
 - base, 305
 - relative, 305, 326
 - Indianapolis Colts, 31
 - inequality, 145
 - infinite loop, *see* loop, infinite
 - infinity, 492
 - information hiding, 402
 - inheritance, 427
 - InputMismatchException, 75
 - instance method, *see* method, instance
 - instance variable, 457, *see* variable, instance
 - instanceof, 445
 - instantiation, 70
 - int, 29, 35, 36, 245, 446
 - Integer, 303, 446
 - parseInt, 303, 347, 412, 431, 462
 - interactive development environment, 4, 14
 - interface, 7, 427, 458
 - declaration, 69
 - IOException, 370, 423, 446
 - Iterable, 439, 473
 - iterator, 473
 - iteration, 180
 - Iterator, 473
 - hasNext, 473
 - next, 473
- J**
- Java, 3
 - package, 69
 - project, 69
 - Java Collection Framework, 473
 - Java Development Kit, 3
 - java file, 6

Java Running Environment, 3
 Java Virtual Machine, 3
 java.io, 367
 java.io.File, 367
 java.lang, 69
 java.util, 325
 java.util.Arrays, 325
 java.util.Scanner, 69
 javac, 6
 javadoc, *see* comment, javadoc
 JDK, 69, *see* Java Development Kit
Jerusalem, 234
 JRE, *see* Java Running Environment
 JVM, *see* Java Virtual Machine

K

Krall, Diana Jean, 350

L

\LaTeX , vii
 law of large numbers, 178
 leap year, 454
 length, 295, 296
 Lincoln, Abraham, 60
 line break, 60
 LinkedList, 475
 add, 475
 addFirst, 475
 addLast, 475
 get, 475
 getFirst, 475
 getLast, 475
 remove, 475
 removeFirst, 475
 removeLast, 475
 set, 475
 List, 460, 475
 add, 477
 get, 477
 remove, 477
 set, 477
 list, 475, 476
 head of, 475
 tail of, 475
 literal, 29
 array, 329
 char, 37
 float, 37
 long, 36
 number, 31
 String, 10, 30, 56
 local variable, *see* variable, local
 logarithm, 124, 344
 logical-and, 143
 logical-or, 143
 London, George, 340
 Long, 446

long, 29, 35, 36, 185, 245, 446, 489
 Longfellow, Henry Wadsworth, 16, 25
 loop, 173
 definite, 264
 do-while, *see* do-while loop
 double, 297, 404
 external, 188, 359, 363
 for, *see* for-loop
 for-each, *see* for-each loop
 indefinite, 264, 277
 infinite, 103, 276
 internal, 188, 360, 363
 while, *see* while-loop
 loop variant, 283
 loop-body, 174, 196
 lowercase letter, 228
 ls, 6
 Ludwig, Christa, 340

M

Manning, Peyton Williams, 31
 Mastermind, 291
 Math
 max, 267, 409
 random, 178, 198, 300
 Math, 124
 abs, 125
 acos, 125
 asin, 125
 atan, 125
 cbrt, 125
 ceil, 125, 129
 cos, 125
 E, 124
 exp, 125
 floor, 125, 129
 log, 125
 log10, 125
 max, 125
 min, 125
 PI, 124
 pow, 125
 random, 124
 round, 125, 126
 signum, 125
 sin, 125
 sqrt, 125
 tan, 125
 matrix, 388
 diagonal, 365
 upper-triangular, 365
 Mattila, Karita Marjatta, 340
 max, 125
 maximum, 193, 446
 second, 319
 McRae, Carmen Mercedes, 345
 menu, 245, 246
 merge, 354, 355

- method, 9, 71
 - abstract, 427, 436
 - call, 89, 111, 121
 - dependency, 101
 - instance, 71, 368, 391, 419
 - main, 9
 - order of appearance, 90
 - overloading, 115, 127
 - public, 9
 - static, 9, 32, 44, 391, 399, 427
- method call, 71
- mezzo-soprano, 340
 - concert, 340
- Milenkovic, Victor, vii
- min, 125
- minimum, 193
- mkdir, 6
- modifier, 397
- more, 6
- mortgage, 131
- move, 6
- mv, 6

- N**
- National Football League, 30, 31, 83
- negation, 35, 143
 - double, 144
- Netbeans, 4
- new, 56
- New England Patriots, 31
- newline, 11
- NFL, *see* National Football League
- Nilsson, Birgit, 340
- NoSuchElementException, 73, 264, 281, 381
- null, 146, 303, 446
- NullPointerException, 303, 358, 446
- number, 29
 - combinatorial, 208
 - complex, 421
 - composite, 310
 - prime, 310, 320, 505
 - random, 178
- NumberFormatException, 465, 504
- numeral, 228

- O**
- Object, 446
 - equals, 325
- object-oriented programming, 3
- Ogihara, Ellen, vii
- Oh, Linda May, 345
- Old MacDonald Had A Farm*, 109
- Old MacDonald Had A Farm*, 95
- Oliveira e Silve, Tomás, 270
- operand, 39
- operator, 39
 - binary, 39
 - bit, 39
 - concatenation, 59
 - conditional, 143
 - logical, 143
 - priority of, 41
 - unary, 39
- ordering, 228
- overflow, 266
- override, 427

- P**
- package, *see* visibility, package
- pairwise distinct, 353
- palindrome, 504
- parameter, 9, 111
 - actual, 111, 193, 235
 - formal, 111, 144
 - generic type, 448
 - passing of, 115
 - type signature, 115
- parentheses, 39
- parity, 504
- path, 6, 367
 - absolute, 368
 - canonical, 368
 - concatenation, 368
 - relative, 368
 - separator, 367
- Pawlicki, Taddeus, vii
- PDF, vii
- pencil calculation, 50
- permutation, 139, 322
- π , 42, 43, 124
- Pink Floyd, 330
- polygon, 140
 - area of, 140
- polymorphism, 427, 446
- pound, 121
- power, 207, 222
- prefix, 228, 230
 - length of, 212
- prime number, *see* number, prime
- printf, 225
- printStackTrace, 374
- PrintStream, 72, 384, 462
 - close, 432, 462
 - print, 384
 - printf, 384
 - println, 384
- private, *see* visibility, private
- procedural decomposition, 90, 91
- product, 185
- program, 3
 - interactive, 3
- programming language, 3, 264
- prompt, 4, 320
 - after the execution of a program, 10
- protected, *see* visibility, protected
- public, *see* visibility, public
- punctuation mark, 252, 388

pwd, 6
pyramid, 204

Q

quarterback, 31
 rating, 31
Queue, 475
 offer, 476, 478
 peek, 476, 478
 poll, 478

R

radius, 41, 207
random, 124
random walk, 289
rectangle, 322
rectilinear, 85
recurrence, 486
 first-order, 486
 second-order, 487
recursive call, 493, 494
Reeves, Dianne, 350
reference, 32, 114
Regan, Kenneth W., vii
regular file, 367
relation, 228
 reflexive, 228
 symmetric, 228
 transitive, 228
remainder, 40
representation
 binary, 273
reserved names, 38
return, 120
return type, 119
 boolean, 228
 double, 119
 String, 120
 void, 9
return value, 9, 29, 114, 119, 167, 168
rm, 6
rmdir, 6
round, 125
Row, Row, Row Your Boat, 61
running total, 265, 389

S

San Francisco 49ers, 31
Scanner, 69, 367, 462
 close, 431, 462
 hasNext, 75, 264, 474
 next, 72, 474
 nextBoolean, 75
 nextByte, 75
 nextDouble, 75
 nextFloat, 75
 nextInt, 75, 379
 nextLine, 235, 381, 431
 nextLong, 75
 nextShort, 75
Scanner, 121
 next, 121
Schwarzkopf, Dame Olga Maria Elisabeth Friederike,
 340
search, 231, 343, 352, 353
 sequential, 343, 348
semantics, 427
sequence, 4, 204, 260
 character, 4
 decreasing, 353
 Fibonacci, 201, 218, 485
 increasing, 353
 iteration, 176
 number, 504
Set, 475
 add, 480
 remove, 480
setter, 397, 461
*Several Species of Small Furry Animals Gathered
 Together in a Cave and Grooving With a Pict*, 330
Sgt. Pepper's Lonely Hearts Club Band, 239
ship, 139
Shogi, 398
Short, 446
short, 29, 35, 36, 245, 446
sign, 36
significand, 36
soprano, 340
 concert, 340
sort, 352, 353, 355
SortedSet, 475
source code, 3, 11
spacing, 11, 32
Spalding, Esperanza Emily, 345
speeding, 66, 85
sphere, 41
 surface area of, 41
 volume of, 41, 138
square root, 283
StackOverflowError, 103
standard deviation, 319
statement, 10
 combined, 349
static method, *see* method, static
statistics, 420
Stirling's Formula, 489
String, 56, 245
 character position, 225
 charAt, 225, 255
 compareTo, 228, 458
 endsWith, 230
 equals, 228
 format, 399, 409
 indexOf, 231, 276
 lastIndexOf, 231
 length, 225
 nextLine, 464

- String (*cont.*)
 - replace, 234
 - replaceFirst, 234
 - split, 225, 317, 381, 441
 - startsWith, 230
 - substring, 234
 - toCharArray, 225, 317, 321
 - toLowerCase, 234, 257, 307
 - toUpperCase, 234, 384, 439
 - trim, 234
 - StringBuilder, 237, 252, 404, 439
 - append, 237
 - charAt, 237
 - delete, 237
 - indexOf, 237
 - insert, 237
 - lastIndexOf, 237
 - length, 237
 - substring, 237
 - StringIndexOutOfBoundsException, 227, 234, 237
 - student, 454
 - sub-interface, 436
 - subclass, 436
 - sublime, 3
 - Sudoku, 365
 - suffix, 230, 288
 - summation, 48, 184, 185
 - partial, 205, 358
 - super, 437, 448
 - Super Bowl, 31
 - super-interface, 436
 - superclass, 436
 - Sutcliffe, Geoffrey, vii
 - Swing Low, Sweet Chariot*, 232
 - switch, 245, 433, 464
 - syntax, 3, 427
 - System, 10
 - System.err, 10
 - System.in, 10
 - System.in.print, 57
 - System.out, 10, 384
 - System.out.print, 10
 - System.out.printf, 147, 229, 333
 - System.out.printf, 135
 - System.out.println, 10
- T**
- tab-stop, 11, 26, 390
 - table loop-up, 319
 - tax, 66, 84
 - Terminal, 3
 - this, 409, 416, 428, 437
 - This Old Man*, 140
 - This Old Man*, 107
 - throw, 193
 - Throwable, 446
 - throws, 370, 430
 - Tic-Tac-Toe, 421
 - time, 84
 - military, 421
 - Toblerone, 139
 - toilet paper, 207
 - token, 71
 - torus, 288
 - Tower of Hanoi, 500
 - trapezoid, 67
 - area of, 67
 - triangle, 168, 290
 - area of, 290
 - isosceles, 22
 - right-angled, 20, 168
 - true, 35
 - try, 371
 - try-catch, 74, 389
 - Twain, Mark, 19, 254
 - type, 6
- U**
- Ummagumma*, 330
 - Unicode, 228
 - United States of America, 214
 - up-casting, 445
 - uppercase letter, 228
- V**
- variable, 29
 - field, 30
 - global, 30, 346
 - indicator, 348
 - instance, 30, 391, 393, 428
 - iteration, 176, 180
 - local, 30, 32
 - permitted characters for, 32
 - private, 396, 428
 - scope of, 38, 178
 - static, 391, 427
 - variance, 420
 - Varnay, Ibolyka Astrid Maria, 340
 - Vaughan, Sarah Lois, 350
 - vending machine, 268
 - verse, 108
 - vim, 3
 - visibility, 7, 34
 - package, 7
 - private, 7, 34, 448, 457
 - protected, 7, 34
 - public, 7, 34, 436
 - vowel, 261
- W**
- Waiting for Godot*, 277
 - Watanabe, Osamu, vii
 - while-loop, 173, 381, 447, 486, 498

white space, 11
wildcard, 70, 367
Wilson, Cassandra, 350
Wilson, Nancy, 350
Windgassen, Wolfgang, 340
Windows, 6

Winstone, Norma Ann, 350
wraparound, 59, 60

Y

Young, Jon Steven “Steven”, 31