

INDEX

- abstract, 11, 22, 48, 232, 241–243, 265, 289, 291, 299, 304–306
- abstraction, 11, 241, 299, 322, 323, 337, 593, 598, 654
- access specification, 149, 220–231, 272, 294, 299, 301, 305, 323, 355, 356
- addSuppressed(Throwable e), 398
- advanced programming, 10, 18, 20–21
- AnnotationFormatError, 367
- append(CharSequence csq), 598
- append(CharSequence csq, int start, int end), 598
- append(char c), 598
- Appendable, 567
- ArithmeticException, 364, 365, 371, 372, 374, 375, 378–380, 382, 384, 385, 392, 393, 397, 402–403, 405, 412, 418–420, 424
- ArrayIndexOutOfBoundsException, 372, 385, 392, 397, 405, 419, 422
- arrays, 41, 47, 92–97, 107–108, 259, 373, 535, 538, 541, 594, 595, 597, 601, 660, 669
- ArrayStoreException, 372, 741
- ASCII codes, 43–45, 63, 116
- assembler, 3, 22, 40
- assembly language, 2, 3
- assert, 48, 121–123, 367
- AssertionError, 121–123, 367
- Assertionstatement, 121–123
- AutoCloseable, 411, 535, 559, 562, 567, 595
- automatic resource management (ARM), 409, 410
- AWTError, 367

- beepMe() method, 112
- BigDecimal nextBigDecimal(), 623
- BigInteger nextBigInteger(), 623
- BigInteger nextBigInteger(int radix), 623
- bit-wise operators, 77, 82
- block statement, 109–123, 125, 127, 129, 131, 193
- blockTest(), 109
- boolean canRead(), 629
- boolean canWrite(), 629
- boolean checkError(), 569
- boolean createNewFile(), 630
- boolean data type, 64
- boolean delete(), 630
- boolean enable, 579
- boolean equals(Object obj), 631
- boolean exists(), 629
- boolean isAbsolute(), 629
- boolean isAlive(), 434
- boolean isDaemon(), 434, 437
- boolean isDestroyed(), 437
- boolean isDirectory(), 630
- boolean isFile(), 630
- boolean isInterrupted(), 434
- Boolean logical operators: & && | || &= |= ?, 84, 85
- boolean markSupported(), 537, 547
- boolean mkdir(), 630
- boolean nextBoolean(), 623
- boolean parentOf(ThreadGroup g), 437
- boolean readBoolean(), 560
- boolean renameTo(File dest), 631
- boolean setLastModified(long time), 631
- boolean setReadOnly(), 631
- break, 48, 49, 117–122, 132–136, 145, 325, 336, 349, 381, 389, 393, 416, 716, 717
- BufferedInputStream, 545–548, 573, 576, 599, 646

- BufferedOutputStream, 538, 545, 548–550, 574, 599, 646
- BufferedReader, 190–191, 369, 370, 523, 594, 599, 607–610, 626, 649, 650, 653
- BufferedWriter, 523, 597, 599, 607, 609–611, 650–651
- BufferedReader class, 190–191, 607, 608, 626
- built-in Java packages, 289–291
- byte, 3, 12–15, 33, 35, 36, 45, 53, 55, 70, 78, 120, 186, 264, 409–412
- ByteArrayInputStream, 521, 535, 536, 540–542, 545, 547, 551, 576, 599, 603
- ByteArrayOutputStream, 521, 537, 538, 540, 543–545, 549, 599
- byte[] buf, 546, 548, 550
- byte code verifier, 13
- byte nextByte(), 623
- byte nextByte(int radix), 623
- byte readByte(), 560
- byte streams 8.2.2 9, 10, 532–540, 545–559, 573–578, 592–594, 597–599, 614, 617, 645

- call stack, 376–378, 413
- call trace, 376
- casting object, 249–251
- catch(), 373, 390
- chained exception, 402–404, 411
- character arithmetic, 67
- character streams, 532–533
- CharArrayReader, 521, 523, 594, 599–603, 650
- CharArrayWriter, 521, 523, 596, 597, 599, 602, 603
- charAt(..), 106, 381, 416, 624, 625
- CharConversionException, 524, 525
- char data type, 62–63, 164
- char pathSeparatorChar, 627
- char readChar(), 560
- char separatorChar, 627
- checked exceptions, 367–370, 407
- checkError(), 568, 569, 571, 572, 614
- class BeeperTest, 112
- ClassCastException, 372, 421, 742
- class Error, 362, 366
- class Exception, 363, 364, 366, 368, 371, 372, 375, 381, 385, 395, 397, 399, 404, 406, 412, 418, 524
- class Fields, 237
- class File, 33, 36, 37, 292, 293, 296, 304, 310, 339, 340, 553, 554, 557, 603–605, 627–632, 638
- class FileDescriptor, 627, 638–640
- class Integer, 185, 257, 265, 268, 269, 724, 741, 743, 750
- ClassLoader getContextClassLoader(), 433
- Class Methods, 160, 172, 189, 542
- ClassNotFoundException, 367, 369
- class Number, 265, 343, 678, 681, 683
- class Object, 147, 151, 152, 156, 169, 170, 187, 188, 218, 219
- CLASSPATH, 295, 297–299, 337–338, 358, 588
- class Random, 324, 627, 644
- class RandomAccessFile, 626–627
- class String, 47, 98–103, 105–107, 121, 159, 181, 211, 212, 241, 251, 257, 291, 523, 571, 584, 614
- class Thread, 431–433, 435–438, 440–450, 455, 456, 458, 459, 463, 468, 472
- class ThreadGroup, 426, 431–433, 435–437, 444, 496–501
- class ThreadLocal, 426, 431, 437–438
- class Throwable, 366, 392, 393, 397, 398, 402, 411
- client/server technology, 13
- clonable, 584
- clone(), 252, 254, 334, 335, 433
- Cloneable, 254, 334–336, 369, 433
- Cloneable interface, 254, 335–336, 369
- CloneNotSupportedException, 369
- close(), 7, 8, 369, 390, 408–411, 536, 537, 539, 542, 543, 545, 547, 549, 555, 556, 562, 572, 574, 576, 577, 589, 590, 592, 595, 598, 601, 603, 606, 611, 613, 616, 619
- closeable, 411, 522, 535, 559, 562, 567, 595
- closeable interfaces, 535, 559, 595
- code compatibility with generic programming, 722–725
- CoderMalfunctionError, 367
- command line input, 184–186, 205, 379, 391, 412, 413, 635, 650
- comparable, 334–337, 680–682, 727, 729, 745, 749
- compareTo(), 104, 681, 683, 750
- compiler/interpreter, 31
- compile-time polymorphism, 161, 216
- concurrent precedence graph (CPG), 457–459, 462–463

- console, 20, 25, 184, 189, 190, 496, 519, 523, 524, 527–529, 532, 593, 608, 614, 617
- console object, 184, 189, 593
- constants, 41, 49–52, 91, 98, 103, 136, 231, 304, 305, 309, 311, 312, 314, 318, 322–326, 333
- constructor chaining, 204, 236, 272, 276
- constructor overloading, 161–163, 204, 235
- constructors, 159–161, 175, 217–219, 231, 402
- constructors in inheritance, 217–219
- continue, 48, 132, 134–136, 380, 382, 389, 551
- control structures, 42, 108–136
- core programming, 18, 20, 21
- createException(), 403
- creating object, 150–151, 672
- critical section problem, 466, 492

- daemon thread, 434, 437, 483, 500–505
- dangling else in if-else-if ladder, 115–116
- DataInput, 521, 522, 560
- DataInputStream, 16, 184, 191–193, 395, 396, 408, 410, 521, 523, 535, 536, 559–565, 567, 573, 646, 650
- DataOutput, 522
- DataOutputStream, 16, 408, 410, 521, 523, 537, 538, 559, 562–567, 574
- decimal literals, 56–58
- declaration of an object, 151, 202, 584
- default, 48, 117, 118, 120
- default ReadObject(), 579
- deserialization, 525, 582–588
- destroy, 435–437
- diamond operator, 722
- distributed computing, xxxvii, 18
- double, 48, 58, 59–61, 67, 69–70, 98, 107, 127, 150, 152
- double nextDouble(), 623
- double readDouble(), 560
- do-while loop, 124, 130–131, 134
- dynamic method dispatch, 244, 246–247, 273

- early/static binding, 240
- elements[], 398
- ellipsis, 258–262, 661–666
- enableResolveObject, 579
- encapsulation, 6, 20, 146–206
- endsWith(), 634
- enum, 91, 127, 128

- EnumConstantNotPresentException, 372
- EOFException, 524, 525, 567, 640
- equals, 103, 256, 384, 406, 416, 435, 437, 609, 631, 676
- equals(), 103
- equals(Object), 252
- equalsIgnoreCase(), 103
- erasure, 722, 725–726, 741, 743, 744
- err, 526, 527, 531–532, 555, 571, 637, 638, 648
- error, 100, 109, 121
- Escape sequences, 45, 46, 98, 99
- EventListener, 305
- exception, 105, 121, 192, 206, 359–424
- exception classes, 361, 366, 367, 369, 371, 395, 397, 523–525, 742
- exception handler, 373, 374, 376–379, 383, 386, 392, 394, 405, 414, 415, 431, 433, 434, 437
- expressions, 41, 47, 48, 65–91, 111, 140, 149, 626
- extends, 48, 147
- extends clause, 678, 731
- Externalizable, 521, 522

- FactoryConfigurationError, 367
- FileChannel getChannel(), 553, 641
- File class, 33, 37
- File createTempFile(String prefix, String suffix), 631
- File createTempFile(String prefix, String suffix, File directory), 631
- FileDescriptor getFD(), 553, 642
- FileDescriptor : in, out, err, 556
- FileFilter, 522, 630, 634, 635
- File getParentFile(), 629
- FileInputStream, 407–411, 521, 523, 535, 536, 548, 552–554, 556, 557, 559, 561, 567, 574, 576, 577, 582, 585, 599, 618, 637–640
- FileInputStreamDemo.java, 554, 556
- File[] listFiles(), 630
- File[] listFiles(FileFilter filter), 630
- FilenameFilter, 521, 522, 630, 634, 635
- FileNotFoundException, 369, 370, 408–410, 524, 525, 553, 558, 564, 566, 567, 577, 621, 637, 648, 652
- FileOutputStream, 407–411, 521, 523, 537, 538, 552, 557–558, 566, 568, 570, 572, 581, 583, 584, 599, 612, 620, 637, 639, 640
- FilePermission, 523

- FileReader, 369, 370, 521, 523, 594, 599, 603–604, 607–609, 637, 640, 646
- FileReader(), 369
- FileterInputStream, 573
- FileterOutputStream, 573
- FileWriter, 521, 523, 596, 597, 599, 603, 605–606, 610, 612, 637, 640, 651
- FilterInputStream, 521, 536, 559, 573–575
- FilterOutputStream, 521, 538, 562, 567, 573–575, 599
- FilterReader, 521, 523, 594, 599
- FilterWriter, 521, 523, 596, 597, 599
- final class, 178, 182, 186, 237, 240, 241, 252, 255, 344, 387–389
- finalize, 241, 435, 437, 539
- finalize(), 252, 255, 411, 552, 556
- finally, 48, 241, 387
- finally, 373, 386
- final Throwable[] getSuppressed(), 398
- fixed priority scheduling, 450
- float, 52, 58–61
- floating point literals, 61
- float nextFloat(), 623
- float readFloat(), 560
- flush(), 191, 192, 396, 539, 548–550, 559, 571, 590, 598, 606, 610, 613, 639, 648
- flushable, 522, 562, 567
- for-each, 124, 127, 179
- for-loop, 125, 126, 128
- function-oriented programming, 3–6, 11, 14, 42, 287

- GenericBound, 678–680
- generic class, 256–258, 656–660, 666–744
- generic constructors, 722, 744
- generic inheritance, 722, 729–734
- generic interfaces, 660, 722, 727, 744
- generic method, 255–258, 272, 655–666, 673, 675, 676, 680, 681, 690–696, 704, 721, 727, 744
- generic restrictions, 722
- generics, 654, 655, 689, 690, 721, 723–726, 729–733, 737–742
- getBuffer(), 616, 617
- getClass(), 252–254, 435, 437, 658, 746
- getEncoding(), 618, 619
- goto, 48, 132, 134

- Greentalk, 9
- guarded region, 373, 374, 383, 386
- GUI programming, 18, 20–21

- hard-coded, 51
- hashCode(), 252, 254, 255
- hasNext(), 334, 622
- hasNext(Pattern pattern), 622
- hasNext(String pattern), 622
- hasNextBigDecimal(), 622
- hasNextBigInteger(), 622
- hasNextBigInteger(int radix), 622
- hasNextBoolean(), 622
- hasNextByte(), 622
- hasNextByte(int radix), 622
- hasNextDouble(), 622
- hasNextFloat(), 622
- hasNextInt(), 189, 415, 622, 625
- hasNextInt(int radix), 622
- hasNextLine(), 622, 626
- hasNextLong(), 622
- hasNextLong(int radix), 622
- hasNextShort(), 622
- hasNextShort(int radix), 622
- helper classes, 183, 211, 250
- hexadecimal, 45, 55–58, 75, 76, 78, 99, 252, 572
- hexadecimal literals, 57–58
- high-level language, 2–3

- identifier, 45, 47, 49–52, 55, 148, 179, 288, 362, 363, 433, 456, 628
- if-else statement, 113–116
- if statement, 64, 111–116
- IllegalAccessException, 369, 394, 395, 414
- IllegalArgumentException, 372, 600
- IllegalArumentType, 364
- IllegalMonitorStateException, 372
- IllegalStateException, 372
- IllegalThreadStateException, 372, 504
- implements, 29, 34, 48, 147, 305–309, 311, 312–317, 319–333, 335–336, 345, 347–350, 354, 435, 440, 444–446, 448, 453, 465, 468, 472
- import, 29, 34, 35, 46, 48, 82, 123, 133, 135, 152, 180, 188, 190, 192, 289, 290, 293
- indexOf (String str), 106
- IndexOutOfBoundsException, 105, 372, 385

- information hiding, 6–8, 20, 220, 288, 337
- inheritance, 6, 7, 11, 15, 16, 20, 147, 179, 207–286, 288, 290, 301–303, 306, 311, 312, 318, 319, 323, 329–331, 337, 449, 654, 691, 693
- InputStream, 16, 184, 186, 190–191, 336, 395, 396, 407–411, 521, 523, 527, 528, 535–538, 540–542, 545–548, 550–554, 556, 557, 559–565, 567, 573–575
- InputStreamReader, 190, 521, 594, 599, 600, 608, 609, 617–620
- instance methods, 172, 173, 175, 470, 735
- instanceof, 48, 733–739
- instance variables, 169–171, 174, 232–233, 304, 305, 312, 335, 345
- instantiation, 150, 168–169, 345, 740
- InstantiationException, 369
- instantiation of type parameters, 740
- int activeCount(), 433, 436
- int activeGroupCount(), 436
- int available(), 537, 589
- int compareTo(File pathname), 631
- int compareTo(Object o), 336, 631
- int count, 128, 546, 548, 680, 745
- integer data types, 53–58
- integer literals, 56, 58
- Integrated Development Environments, 22
- int enumerate(Thread[] list), 436
- int enumerate(Thread[] list, boolean recurse), 436
- int enumerate(ThreadGroup[] list), 436
- int enumerate(ThreadGroup[] list, boolean recurse), 436
- interface Runnable, 426, 431, 435, 439, 440, 444–500, 505, 513
- interfaces, 14–16, 19, 24, 147, 254, 287–291, 302–336, 346, 347, 356–358
- internet programming, 1, 17–18, 20–21, 35
- InterruptedException, 369, 439, 441, 442, 448, 454, 460, 462, 463, 466, 473, 479, 480, 482, 489, 494, 502, 503, 511, 512
- InterruptedIOException, 524, 525
- interthread communication, 426, 483, 489–496, 505
- int getMaxPriority(), 436
- int getPriority(), 433, 450
- int marklimit, 546
- int markpos, 546
- int nextInt(), 623
- int nextInt(int radix), 623
- int pos, 546, 550
- int read(), 537, 547, 589, 641
- int read(byte buffer[]), 537
- int read(byte buffer[], int offset, int numBytes), 537
- int read(byte[] b), 589, 641
- int read(byte[] b, int off, int len), 589, 641
- int readInt(), 560
- int readUnsignedByte(), 560
- int readUnsignedShort(), 560
- int skipBytes(int n), 642
- InvalidClassException, 524, 525
- InvalidObjectException, 525
- IOException, 367
- IOException, 190, 367, 369–370, 395, 403, 408–410, 524, 525, 528, 535, 537, 539, 541–544, 547, 550–551, 554, 555, 559, 560, 562–564, 566, 571, 572, 574, 576, 577, 581, 582, 584, 585, 591, 595, 596, 600–605, 608, 610, 615, 616, 619–621, 624–626, 630, 631, 635–637, 640, 642–644, 647, 649, 652, 653
- IO Stream, 524–626
- isAlive(), 434, 463, 488
- iterator, 334–336
- JAR, 295, 297–299, 301
- Java API, 24, 34, 106, 148, 249, 289, 291, 302, 305, 334, 368, 431–438, 505
- java.applet, 22, 35, 37, 289
- java.awt, 22, 35, 37, 289, 290
- java browsers, 23
- Java byte codes, 3, 12, 13, 16, 651
- Java Development Kit (JDK), 9, 21, 22, 25–29, 36, 37, 90, 289, 298, 316, 318, 319, 323, 404, 406, 409, 655, 722, 723
- javadoc, 22, 42
- java.io, 22, 190–192, 289, 290, 336, 338, 369, 370, 407, 408, 410, 411, 519–529, 534, 535, 541, 542, 544, 545, 547, 549, 551, 552, 554, 556, 558, 560, 561, 563, 566, 567, 573, 574, 576, 578, 581
- java.io.Console, 528, 529
- java.io package 3.4.5 29, 30, 190, 191, 407, 519–523, 534, 552, 567, 573, 578, 588, 626, 634, 640, 645, 655
- java.io.Serializable, 583, 584, 588

- java.lang, 22, 34, 77, 82, 98, 101, 104, 182, 265, 290, 336, 364, 365, 366, 368, 398, 411, 426, 431, 444, 490, 496, 521, 524, 526, 571, 678
- java.lang.*, 29, 34, 46, 180, 289, 336, 439
- java.lang.Integer, 77, 265
- java.lang.Number, 243
- java.lang.Object, 249
- java.lang package, 34, 98, 100–101, 104, 182, 265, 290, 336, 364, 366, 368, 426, 431, 439, 444, 490, 496, 526, 681
- java.lang.String, 106, 291, 571
- java.lang.System, 295, 526
- java.lang.Thread, 431–433, 435–438, 449, 490, 496, 513
- java.lang.ThreadGroup, 435–437, 496
- java.lang.ThreadLocal, 437, 438
- java.lang.Throwable, 366
- java.net, 22, 289, 290, 628
- java.net package, 628
- java.nio.channels, 525, 526, 645
- java.nio package, 520, 645
- Java program editor, 21, 24
- java.sql, 22, 289, 290, 299
- java tutorials, 21, 23–25
- java type erasure, 722, 725–726
- java.util, 22, 123, 187, 188, 211, 252, 290, 299, 324, 334, 338, 348, 414, 415, 526, 566, 571, 576, 620, 624, 659, 660, 681, 704, 746
- java.util.Local, 571
- java.util.Scanner, 123, 188, 290, 414–415, 624–625
- java.util.stream, 526
- Java Virtual Machine (JVM), 11–12, 17, 33, 37, 121, 123, 159, 181, 232, 247, 254, 305, 364–366, 368, 373, 376–378, 392, 412, 413, 434, 437, 456, 470, 481, 486, 496, 501, 503–505, 588, 592
- javax, 290–291, 302
- javax.crypto, 290–291
- javax.swing, 22, 290–291
- JDK bundle, 22
- JDK installation, 25–29
- join(), 234, 454, 458, 460, 461, 463, 466, 473, 486, 489, 490, 492, 500, 505, 592
- jre/lib, 298
- jump statements, 132–136
- JVM specification, 159
- keywords, 41, 47–51, 136, 164, 168–183, 198, 231–243, 272, 273, 311, 356, 362, 411, 477, 752
- late/dynamic binding, 240
- length(), 106, 352, 601, 602, 606, 630, 637, 641, 642, 644, 659
- life cycle of a thread, 484–489
- LineNumberInputStream, 521, 523, 573
- LineNumberReader, 521
- LinkageError, 367, 368
- literal, 43, 45–48, 56–58, 61–63, 78, 98, 99, 103, 107
- logical operators with assignment, 81
- long getFilePointer(), 642
- long getId(), 433
- long lastModified(), 630
- long length(), 630, 642
- long nextLong(), 623
- long nextLong(int radix), 623
- long readLong(), 560
- long skip(long numBytes), 537
- looping, 110, 120, 124–132
- lower bound wildcard, 690, 692–694, 696, 699, 703, 704, 748
- machine language, 2–3, 11
- main(), 3, 108, 153, 155, 157, 164, 167–168, 180–184, 199, 260, 262, 321, 369, 370, 377, 378, 389, 395, 403, 414, 431, 438, 458, 496, 512, 662, 664
- mark(int readAheadLimit), 595
- markSupported(), 537, 542, 543, 547, 595, 615
- method overloading, 161, 163–167, 198, 199, 215–216, 244, 258, 261, 262, 654–655, 657, 661, 663, 664
- method overriding, 214–219, 239–240, 244, 272, 317, 657, 731, 732
- mkdir(), 530, 532
- mkdirs(), 630, 632
- monitor, 372, 408, 433, 466, 467, 470, 474, 478, 483, 490, 495, 505, 530, 531, 655
- multiple bounds, 685–686, 744
- multiple exception by a single catch, 404–405
- multiple inheritance, 11, 15, 16, 208–210, 273, 302–304, 306, 318, 323, 329–333, 337, 346, 347, 449

- multitasking, 425, 426, 428–430
- multi-tasking programming, 428
- multithreaded multitasking, 426
- multithreading, 12, 13, 19, 20, 425–518
- mutex, 466

- NaN (not a number), 60, 66
- native, 12, 26, 48, 254, 312, 489, 593
- NegativeArraySizeException, 372
- negative infinity, 60
- nested class, 157–158, 301, 321, 322
- nested control structures, 131–132
- nested if statement, 114–115
- newLine(), 610
- new operator, 151, 160, 163, 168, 311, 393
- next(), 334, 622, 625
- nextByte(), 187, 623
- nextDouble(), 187, 188, 324, 348, 623, 624, 626
- nextFloat(), 187, 623
- nextInt(), 123, 133, 135, 187–189, 415, 424, 623–626
- nextLine(), 187, 188, 190
- nextLong(), 187
- nextShort(), 187
- non-serialization (non-synchronization), 465
- non-transitivity, 241
- NoSuchFieldException, 369
- NoSuchMethodException, 369
- NotActiveException, 525
- notify(), 252, 485, 490, 492, 496
- notifyAll(), 251–252, 490, 492, 496, 518
- NotSerializableException, 525
- NullPointerException, 571
- NullPointerException, 367, 372, 384
- NumberFormatException, 367, 372, 379–380, 413, 418

- Oak, 9
- Object class, 249, 251, 252, 258, 262–263, 266, 272, 334, 431, 435, 437, 490, 492, 661, 664–666, 695, 704, 735
- ObjectInput, 521, 522
- ObjectInputStream, 336, 521, 535, 536, 538, 578, 579, 582, 584, 585, 599, 646
- ObjectInput Stream.GetField, 523
- ObjectInputValidation, 522

- object-oriented programming (OOP), 1, 3, 5–11, 14, 20, 37–39, 146, 147, 198, 207, 241, 248, 287, 449, 654
- ObjectOutputStream, 578
- ObjectOutput, 522
- ObjectOutputStream, 336, 521, 536–538, 578–582, 584, 585, 599, 646
- ObjectOutputStream.PutField, 580
- ObjectOutputStream. PutField putFields(), 580
- ObjectStreamClass, 521, 579, 580 (ObjectStreamClass desc), 579, 580
- ObjectStreamConstants, 522, 578
- ObjectStreamException, 524, 525
- ObjectStream Field, 523
- object wrappers, 264–266, 268, 271, 272
- octal, 55–58, 63, 572
- octal literals, 56–58, 63
- op= += -= *= /= %=, 89
- operator associativity, 89–90
- operator precedence, 67, 88–90
- operators: + - * / %, 65
- operators: ++, --, 73
- OptionalDataException, 524, 525
- org.omg.CORBA, 291
- output stream, 336, 407–411, 523, 530, 535–538, 544, 545, 548–549
- OutputStreamWriter, 521, 597, 599, 600, 617–620

- package sealing, 301–302
- parameter passing, 158–159, 266–272, 722–723
- parametric polymorphism, 654
- parseInt(), 185, 379
- partial synchronization, 471–474
- PipedInputStream, 521, 536, 588–592, 599, 646
- PipedOutputStream, 521, 523, 538, 588–591, 599, 646
- PipedReader, 521, 523, 594, 599
- PipedWriter, 521, 523, 597, 599
- platform-independent programming, 11–12, 645
- polymorphism, 6, 8–9, 11, 14, 20, 161–167, 214–216, 243–248, 272, 305, 306, 323, 326–329, 654
- portable programming, 16
- positive infinity, 60
- preemptive, 452, 454, 455, 456

- primitive data types, 41, 47, 53–64, 73, 257, 520, 522, 559, 562, 578, 613, 645
- print(), 57, 157, 176–178, 182, 258, 273, 275, 284–286, 332, 333, 362, 393, 466, 530, 531, 614, 675, 697–699
- print("..."), 134
- printf(), 182–183, 530, 531, 570–572, 614, 647, 656
- printf(Locale l, String s, Object ...), 569
- printf(String s, Object ...), 569
- println(), 100, 102, 130, 132, 181–182, 259–261, 263, 381, 393, 439, 444, 528, 530, 531, 542
- PrintStream, 182, 186, 398, 521, 523, 527, 528, 530, 532, 537, 538, 567–572, 574, 599, 611, 612, 614, 655
- PrintStream append(CharSequence cs), 569
- PrintStream append(CharSequence cs, int sta, int end), 569
- PrintStream append(char c), 569
- PrintStream format(Locale l, String s, Object ...), 569
- PrintStream format(String s, Object ...), 569
- PrintWriter, 398, 521, 523, 572, 596, 597, 599, 611–614, 645
- private, 48, 220, 223–231, 243, 248
- protected, 48, 227–231, 252, 255, 299, 301, 308, 320, 332, 345, 347, 352, 353, 433, 438, 546, 553
- protected boolean
 - enableReplaceObject(boolean enable), 580
- protected Object clone(), 252, 433
- protected Object replaceObject(Object obj), 580
- protected T initialValue(), 438
- protected void annotateClass(class ? c), 580
- protected void annotateProxy Class(class? c), 580
- protected void clearError(), 569
- protected void drain(), 580
- protected void receive(int b), 589
- protected void setError(), 569–570
- protected void write ClassDescriptor (ObjectStreamClass desc), 580
- protected void writeObjectOverride (Object obj), 580
- protected void writeStreamHeader(), 580
- public static final, 48, 149, 305, 311, 345, 354, 657
- public void run(), 435, 448, 450, 452, 453, 455, 459–462, 465, 468, 469, 472–473, 475–476, 479, 480, 482, 485, 487, 488, 497–498, 500–502, 504, 506–509
- PushbackInputStream, 521, 523, 535, 536, 545, 550–552, 573, 599
- PushbackOutputStream, 537, 538
- PushbackReader, 521, 523, 594, 599
- RandomAccessFile, 521, 523, 640–641, 643–646, 649, 651, 652
- RandomAccessFile class, 640–641
- raw type, 723–725, 742
- read(), 118–120, 122, 184, 186–187, 409, 410, 492, 493, 495, 509, 528, 537, 541–543, 545, 547, 550–552, 555
- read(CharBuffer target), 595
- read(char[] cbuf), 595
- read(char[] cbuf, int off, int len), 595
- Reader, 191, 492
- Reader class, 191–191, 594–598, 600, 604, 607, 608, 614, 617, 618, 626
- readFields(), 579
- readLine(), 189, 190, 192, 369, 370, 396, 529, 560, 561, 609, 641
- readObject(), 579, 582, 585
- readObject Override(), 579
- readStreamHeader(), 579
- readUnshared(), 579
- ready(), 596, 601, 615
- recursion, 193–198, 705
- refactoring, 586–587
- reference final variable, 241
- ReflectiveOperationException, 369
- Relational operators, 64, 83–84
- Remote, 584
- replace(char oldChar, char newChar), 106
- reset(), 537, 542, 543, 545, 547, 548, 552, 554, 580, 595, 596, 603, 609, 615
- resolveClass, 579
- resume(), 435, 485
- rethrow, 368, 398, 405–407, 411
- Robust execution, 12
- rt.jar, 298
- RuntimeException classes, 371

- Scanner class, 184, 187–191, 290, 620–626, 646
- secure programming, 13, 14
- separators () [] ;, . ::, 47, 90
- SequenceInputStream, 521, 523, 535, 536, 575–577, 599
- SequenceOutputStream, 538
- Serializable, 334–336, 470, 521–525, 582–584, 588
- SerializablePermission, 523
- serialization, 290, 465–466, 471, 520, 522, 525, 580, 582–586, 593, 645
- serialver, 588
- serialVersionUID, 583, 588
- setDaemon(), 501, 503, 504
- setErr(), 528
- setIn(), 528
- setOut(), 528
- shift operations, 78–79
- short nextShort(), 623
- short nextShort(int radix), 623
- short readShort(), 560
- singleton, 199, 225–227
- size(), 189, 415, 545
- skip(long n), 596
- split(...), 105
- SQLException, 367, 369
- StackTraceElement[] getStackTrace(), 433
- StackTraceElement[] getStackTrace(), 398, 433
- standard error stream, 433, 527–532, 638
- standard input stream, 527, 638
- standard I/O streams, 526–536, 645
- standard output stream, 527, 530, 571, 638
- startsWith(String prefix), 106
- static boolean holdsLock(Object obj), 433
- static boolean interrupted(), 434
- static import, 295
- static int activeCount(), 433
- static int enumerate(Thread[] tarray), 433
- static int MAX_PRIORITY 7.2.1 5, 432
- static int MIN_PRIORITY, 432
- static int NORM_PRIORITY, 432
- static MapThread.StackTraceElement[] getAllStackTraces(), 433
- static String readUTF(DataInput in), 560
- static Thread currentThread(), 433
- static Thread.UncaughtExceptionHandler getDefaultUncaughtExceptionHandler(), 433
- static void dumpStack(), 433
- static void setDefaultUncaughtExceptionHandler(Thread.UncaughtExceptionHandler eh), 434
- static void sleep(long millis), 434
- static void sleep(long millis, int nanos), 434
- static void yield(), 435
- stop(), 302, 303, 435, 487, 488, 512
- StreamCorruptedException, 524, 525
- StreamTokenizer, 521, 523
- strictfp, 48
- String args[], 29, 34, 38, 46, 61, 63, 64, 66, 67, 70, 73, 77, 81, 85, 88, 95, 108, 109, 112, 118–123, 125, 128, 132, 152, 156, 157, 158, 160, 162, 164, 165, 167, 170, 173, 175, 177, 180, 181, 183–188, 190, 195, 198, 213, 215, 218, 219, 221–226, 228, 233, 235, 238–240, 242, 248, 250, 254, 259–262, 295, 296, 315–317, 319–321, 325, 332, 366, 371, 380, 382, 385, 389, 391
- StringBufferInputStream, 523, 599
- String getAbsolutePath(), 629
- String getLocalizedMessage(), 398
- String getMessage(), 398
- String getName(), 433, 436, 629
- String getParent(), 629
- String getPath(), 629
- StringIndexOutOfBoundsException, 105
- String[] list(), 630
- String[] list(FilenameFilter filter), 630
- string literals, 45, 46, 98–99
- String next(), 623
- String next(Pattern pattern), 623
- String next(String pattern), 623
- String nextLine(), 187, 623
- string operations, 100–107
- String pathSeparator, 627
- StringReader, 521, 523, 594, 599, 614–616
- String readLine(), 641–642
- String readUTF(), 560, 641
- Strings, 9, 46, 47, 93, 98–108, 121, 526, 528, 531, 558, 597, 626, 630, 631, 655, 660, 669, 674, 681, 683, 709, 724, 741
- String separator, 627
- String toString(), 252, 253, 435, 437, 581, 583, 603, 613, 631, 747
- StringWriter, 521, 523, 596, 597, 599, 616, 617
- strongly typed, 15, 41–42, 53

- sub classer responsibility, 243
- substring(...), 105
- super, 48, 209, 212–214, 217–219, 225, 230, 231, 274–277, 282, 306, 333, 347, 348, 399, 404, 406, 452
- super(), 218–219, 232, 234–236, 273, 276
- super development kit (SDK), 21–22, 298, 302
- suspend(), 435, 485, 487, 489–492
- switch statement, 116–121, 145
- symbolic constants, 52
- sync(), 638, 639
- SyncFailedException, 524, 525
- synchronization, 450, 464–467, 470–483, 505, 562
- synchronize, 469–476, 479–480
- synchronized block, 467, 470–471, 473–477, 481, 505
- synchronized method, 467–470, 474, 476–477
- System.err, 527, 531, 532, 555, 571, 637, 648
- System.in.read(), 118–120, 122, 184, 186–187, 528
- System.out, 29, 34, 37, 42, 46, 56, 57, 61, 64, 66, 67, 68, 70, 71, 73, 77, 81, 83, 85, 88, 91, 96, 98, 100–102, 104, 105, 107–109, 111, 112, 116, 118, 120–123, 125, 126, 128, 130–133, 136, 153, 156, 157, 159, 161, 162, 164–167, 170, 172, 173, 176–178, 180–182, 186–190, 192–195, 198, 201, 209, 212, 214, 217–219, 221–226, 268–271, 274–278, 362–366, 369–377, 389–405, 439–456, 460, 462, 463, 465
- System.out.flush(), 191, 192, 396
- System.out.printf(), 182–183
- System.out.println, 29, 34, 37, 42, 46, 56, 57, 61, 64, 66, 67, 68, 70, 71, 73, 77, 81, 83, 85, 88, 91, 96, 98, 100–102, 104, 105, 107–109, 111, 112, 116, 118, 120–123, 125, 126, 128, 130–133, 136, 153, 156, 157, 159, 161, 162, 164–167, 170, 172, 173, 176–178, 180–182, 186–190, 192–195, 198, 201, 209, 212, 214, 217–219, 221–226, 268–271, 274–278, 362–366, 369–377, 389–405, 439–456, 460, 462, 463, 465
- System.out.println (), 100, 132, 259–261, 263, 439, 444, 530, 601, 661–665, 700
- System.out.println() 8.2.1 8, 100, 132, 259–261, 263, 439, 444, 530, 542, 567, 601, 661–665, 699–701, 708, 718, 729, 738, 739, 754
- System.out.write(), 531
- SystemThreadGroup, 496
- tagging interface, 305
- T get(), 438, 746
- third party code, 471, 474–483
- this, 42, 43, 49, 102
- this(), 205, 236, 273, 283, 284
- Thread, 375, 414
- Thread(), 432
- Thread(Runnable target), 432, 444
- Thread(Runnable target, String name), 432, 444
- Thread(String name), 432
- Thread(ThreadGroup group, Runnable target), 432, 444
- Thread(ThreadGroup group, Runnable target, String name), 432, 444
- Thread(ThreadGroup group, Runnable target, String name, long stackSize), 432, 444
- Thread(ThreadGroup group, String name), 432, 444
- ThreadDeath, 367–368
- Thread group, 426, 431–433, 435–437, 444
- ThreadGroup getParent(), 436
- ThreadGroup getThreadGroup(), 433
- Thread.join(), 505
- ThreadLocal, 426, 431, 437–438
- ThreadLocal(), 437
- Thread.State, 433
- Thread.State getState(), 433
- Thread.UncaughtExceptionHandler
 UncaughtExceptionHandler(), 433
- throw, 48, 190, 334, 365, 366, 368, 370, 373, 392, 393–406
- Throwable, 366, 367, 371, 392–394, 397, 398, 402, 404, 411, 437, 742
- Throwable fillInStackTrace(), 398
- Throwable getCause(), 398, 402
- Throwable initCause(Throwable cause), 402
- Throwable initCause(Throwable e), 398
- throws, 48, 190, 334, 366, 368, 370, 373, 392, 394–396, 399, 401, 404, 406, 407, 412, 414, 421, 499, 500, 503, 528, 541, 543, 544
- toCharArray(), 602, 603
- toLowerCase(), 106, 226
- toString(), 106, 107, 252–254, 265, 266, 387, 392, 397, 435, 437, 545, 571, 581, 583, 602, 603, 613, 614, 616, 617, 631, 747, 748
- toUpperCase(), 106, 226, 541

- TransformerFactoryConfigurationError, 367
- transient, 48, 579, 580, 583, 584, 586, 587
- trim(), 106
- try, 383, 386, 389, 407, 422, 488, 491, 543, 555, 570, 652
- try-catch, 191, 192, 370, 373–382, 386–387, 390, 407–412, 416–417, 419–420, 440, 529, 649
- try-with-resources, 398, 410, 411
- type casting, 11, 69–71, 326, 687–688, 722, 733–740, 744, 750
- type inference, 676–677, 722–723, 744
- type parameter: E, K, N, T, V, S, U, V, 658
- type promotion, 67–70, 80, 164–167

- unbound wildcard, 690, 695–696, 699, 704, 748
- unchecked exceptions, 367, 368, 371–372, 397
- unchecked warnings, 725
- unset, 536, 538
- unicode, 16, 45–47, 51, 63, 67, 75, 99, 532, 533, 560, 593, 598, 606, 611, 613, 617, 644
- Uniform Resource Identifier (URI), 627, 628
- universal super class, 236, 248–272
- unread, 525, 536, 550–552
- UnsupportedEncodingException, 524
- upcasting, 245–247, 250
- upper bound wildcard, 690–693, 700, 701, 703, 704, 747, 752
- use of generic arrays, 740–742
- use of static members, 740–741
- UTFDataFormatException, 524, 525

- valid()., 638
- valueOf(), 107, 571
- varargs method, 258–263, 661–666, 749, 754
- variable-arity method, 258, 661
- variables, 15, 27, 28, 41, 47, 49–53, 56, 58, 63–65, 67, 68, 73, 78, 90, 91, 99, 103, 109–110, 126, 136, 148, 149, 159, 161, 168–174, 176, 178, 179, 182, 185, 232, 237, 240, 241, 245, 248, 250, 254, 263, 288, 298, 299
- VirtualMachineErrorthree, 367
- visibility control, 298, 299–301
- void checkAccess(), 433, 436
- void close(), 537, 539, 589, 590, 641
- void connect (Piped OutputStream src), 589
- void connect (PipedInputStream snk), 590
- void defaultWriteObject(), 580
- void deleteOnExit(), 630
- void destroy(), 436
- void flush(), 539, 590
- void interrupt(), 434, 436
- void join(), 434
- void join(long millis), 434
- void join(long millis, int nanos), 434
- void list(), 437
- void mark(int numBytes), 537
- void print (primitive type), 569
- void println(argument), 569
- void printStackTrace(), 398
- void printStackTrace(PrintStream stream), 398
- void printStackTrace(PrintWriter stream), 98
- void readFully(byte[] b), 41
- void readInt(), 563
- void remove(), 334, 438
- void reset(), 537, 580
- void reset(), 537, 580
- void run(), 240, 285, 434, 435, 448, 450, 452–455, 459–462, 465, 468, 469, 473, 476, 479, 480, 482, 485, 487, 488, 497, 498, 500–502, 504, 506–511, 513–518
- void seek(long pos), 641
- void set(T value), 438
- void setContextClassLoader(ClassLoader cl), 434
- void setDaemon(boolean daemon), 437
- void setDaemon(boolean on), 434
- void setLength(long newLength), 641
- void setLength(long newLength), 641
- void setMaxPriority(int pri), 437
- void setName(String name), 434
- void setPriority(int newPriority), 434, 450
- void setStackTrace(StackTraceElement elements[]), 398
- void setUncaught Exception Handler (Thread.UncaughtExceptionHandler eh), 434
- void start(), 142, 201, 302, 434
- void uncaughtException(Thread t, Throwable e), 437
- void useProtocolVersion(int version), 580
- void write(byte buffer[]), 539
- void write(byte buffer[] , int offset, int numBytes), 539
- void write(byte[] b), 642
- void write(byte[] b, int off, int len), 590, 642
- void write(int b), 539, 642

- void writeBoolean(), 563
- void writeBytes(String s), 642
- void writeChars(), 563
- void writeChars(String s), 642
- void writeDouble(), 563
- void writeFields(), 580
- void writeFloat(), 563
- void writeLong(), 563
- void writeObject(Object obj), 580
- void writeShort(), 563
- void writeUnshared(Object obj), 580
- void writeUnsignedByte(), 563
- void writeUnsignedShort(), 563
- void writeUTF(), 563
- void writeUTF(String str), 642
- void writeXYZ(XYZ v), 642
- volatile, 48, 506
- Von Neumann architecture, 2
- wait(), 252, 485, 490, 492, 496, 505
- while loop, 124, 129–131, 133–135, 194, 387, 456
- wildcard *, 299
- wrapper classes, 106–107, 199, 240, 249, 263–272, 584, 678
- write(), 492, 493, 495, 530, 539, 545, 606
- write(char[] cbuf), 598
- write(char[] cbuf, int off, int len), 598
- write(int c), 598
- write(String str), 598
- write(String str, int off, int len), 598
- WriteAbortedException, 524, 525
- Writer class, 596–598, 602, 605, 609–611, 616, 620
- XYZ readXYZ(), 641
- yield(), 435, 487, 509