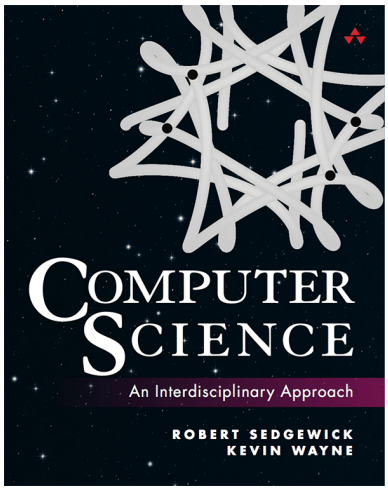

Java Programs in the Textbook

Standard libraries.

Here are the standard input and output libraries that we use throughout the textbook.

Programs in the textbook.

Below is a table of the Java programs in the textbook. Click on the program name to access the Java code; click on the reference number for a brief description; read the textbook for a full discussion. You can download all of the programs as introcs.jar and the data as introcs-data.zip.

1	**ELEMENTS OF PROGRAMMING**	
1.1.1	HelloWorld.java	Hello, World
1.1.2	UseArgument.java	using a command-line argument
1.2.1	Ruler.java	string concatenation example
1.2.2	IntOps.java	integer multiplication and division
1.2.3	Quadratic.java	quadratic formula
1.2.4	LeapYear.java	leap year
1.2.5	RandomInt.java	casting to get a random integer
1.3.1	Flip.java	flippling a fair coin
1.3.2	TenHellos.java	your first while loop
1.3.3	PowersOfTwo.java	computing powers of 2
1.3.4	DivisorPattern.java	your first nested loops
1.3.5	HarmonicNumber.java	harmonic numbers
1.3.6	Sqrt.java	Newton's method
1.3.7	Binary.java	converting to binary
1.3.8	Gambler.java	gambler's ruin simulation
1.3.9	Factors.java	factoring integers
1.4.1	Sample.java	sampling without replacement
1.4.2	CouponCollector.java	coupon collector simulation
1.4.3	PrimeSieve.java	sieve of Eratosthenes
1.4.4	SelfAvoidingWalk.java	self-avoiding random walks
1.5.1	RandomSeq.java	generating a random sequence
1.5.2	TwentyQuestions.java	interactive user input
1.5.3	Average.java	averaging a stream of numbers

1.5.4	RangeFilter.java	a simple filter
1.5.5	PlotFilter.java	standard input-to-drawing filter
1.5.6	BouncingBall.java	bouncing ball
1.5.7	PlayThatTune.java	digital signal processing
1.6.1	Transition.java	computing the transition matrix
1.6.2	RandomSurfer.java	simulating a random surfer
1.6.3	Markov.java	mixing a Markov chain
2	**FUNCTIONS**	
2.1.1	Harmonic.java	harmonic numbers (revisited)
2.1.2	Gaussian.java	Gaussian functions
2.1.3	Coupon.java	coupon collector (revisited)
2.1.4	PlayThatTuneDeluxe.java	play that tune (revisited)
2.2.1	StdRandom.java	random number library
2.2.2	StdArrayIO.java	array I/O library
2.2.3	IFS.java	iterated function systems
2.2.4	StdStats.java	data analysis library
2.2.5	StdStats.java	data analysis library
2.2.6	Bernoulli.java	Bernoulli trials
2.3.1	Euclid.java	Euclid's algorithm
2.3.2	TowersOfHanoi.java	towers of Hanoi
2.3.3	Beckett.java	Gray code
2.3.4	Htree.java	recursive graphics
2.3.5	Brownian.java	Brownian bridge
2.3.6	LongestCommonSubsequence.java	longest common subsequence
2.4.1	Percolation.java	percolation scaffolding
2.4.2	VerticalPercolation.java	vertical percolation
2.4.3	PercolationVisualizer.java	percolation visualization client
2.4.4	PercolationProbability.java	percolation probability estimate
2.4.5	Percolation.java	percolation detection
2.4.6	PercolationPlot.java	adaptive plot client
3	**OBJECT ORIENTED PROGRAMMING**	
3.1.1	PotentialGene.java	identifying a potential gene
3.1.2	AlbersSquares.java	Albers squares
3.1.3	Luminance.java	luminance library

3.1.4	Grayscale.java	converting color to grayscale
3.1.5	Scale.java	image scaling
3.1.6	Fade.java	fade effect
3.1.7	Cat.java	concatenating files
3.1.8	StockQuote.java	screen scraping for stock quotes
3.1.9	Split.java	splitting a file
3.2.1	Charge.java	charged-particle data type
3.2.2	Stopwatch.java	stopwatch data type
3.2.3	Histogram.java	histogram data type
3.2.4	Turtle.java	turtle graphics data type
3.2.5	Spiral.java	spira mirabilis
3.2.6	Complex.java	complex number data type
3.2.7	Mandelbrot.java	Mandelbrot set
3.2.8	StockAccount.java	stock account data type
3.3.1	Complex.java	complex number data type (revisited)
3.3.2	Counter.java	counter data type
3.3.3	Vector.java	spatial vector data type
3.3.4	Sketch.java	document sketch data type
3.3.5	CompareDocuments.java	similarity detection
3.4.1	Body.java	gravitational body data type
3.4.2	Universe.java	n-body simulation
4	**DATA STRUCTURES**	
4.1.1	ThreeSum.java	3-sum problem
4.1.2	DoublingTest.java	validating a doubling hypothesis
4.2.1	Questions.java	binary search (20 questions)
4.2.2	Gaussian.java	bisection search
4.2.3	BinarySearch.java	binary search (in a sorted array)
4.2.4	Insertion.java	insertion sort
4.2.5	InsertionTest.java	doubling test for insertion sort
4.2.6	Merge.java	mergesort
4.2.7	FrequencyCount.java	frequency counts
4.3.1	ArrayStackOfStrings.java	stack of strings (array)
4.3.2	LinkedStackOfStrings.java	stack of strings (linked list)

4.3.3	ResizingArrayStackOfStrings.java	stack of strings (resizing array)
4.3.4	Stack.java	generic stack
4.3.5	Evaluate.java	expression evaluation
4.3.6	Queue.java	generic queue
4.3.7	MM1Queue.java	M/M/1 queue simulation
4.3.8	LoadBalance.java	load balancing simulation
4.4.1	Lookup.java	dictionary lookup
4.4.2	Index.java	indexing
4.4.3	HashST.java	hash table
4.4.4	BST.java	binary search tree
4.4.5	DeDup.java	dedup filter
–	ST.java	symbol table data type
–	SET.java	set data type
4.5.1	Graph.java	graph data type
4.5.2	IndexGraph.java	using a graph to invert an index
4.5.3	PathFinder.java	shortest-paths client
4.5.4	PathFinder.java	shortest-paths implementation
4.5.5	SmallWorld.java	small-world test
4.5.6	Performer.java	performer–performer graph

Exercise solutions.

Here is a list of solutions to selected coding exercises.

1	**ELEMENTS OF PROGRAMMING**	
1.1.1	TenHelloWorlds.java	ten Hello, Worlds
1.1.5	UseThree.java	three command-line arguments
1.2.20	SumOfTwoDice.java	sum of two dice
1.2.23	SpringSeason.java	is month and day in Spring?
1.2.25	WindChill.java	compute wind chill factor
1.2.26	CartesianToPolar.java	Cartesian to polar coordinates
1.2.29	DayOfWeek.java	compute day of week from date

1.2.30	Stats5.java	average, min, max of 5 random numbers
1.2.34	ThreeSort.java	sort three integers
1.2.35	Dragon.java	dragon curve of order 5
1.3.8	FivePerLine.java	print integers five per line
1.3.11	FunctionGrowth.java	table of functions
1.3.12	DigitReverser.java	reverse digits
1.3.13	Fibonacci.java	Fibonacci numbers
1.3.15	SeriesSum.java	convergent sum
1.3.31	Ramanujan.java	taxicab numbers
1.3.32	ISBN.java	ISBN checksum
1.3.38	Sin.java	sine function via Taylor series
1.3.41	MonteHall.java	Monte Hall problem
1.4.2	HugeArray.java	creating a huge array
1.4.10	Deal.java	deal poker hands
1.4.13	Transpose.java	tranpose a square matrix
1.4.25	InversePermutation.java	compute inverse permutation
1.4.26	Hadamard.java	compute Hadamard matrix
1.4.30	Minesweeper.java	create Minesweeper board
1.4.33	RandomWalkers.java	N random walkers
1.4.35	Birthdays.java	birthday problem
1.4.37	BinomialCoefficients.java	binomial coefficients
1.5.1	MaxMin.java	max and min from standard input
1.5.3	Stats.java	mean and stddev from standard input
1.5.5	LongestRun.java	longest consecutive run from stdin
1.5.11	WordCount.java	word count from standard input
1.5.15	Closest.java	closest point
1.5.18	Checkerboard.java	draw a checkerboard
1.5.21	Rose.java	draw a rose
1.5.22	Banner.java	animate a text banner
1.5.31	Spirograph.java	draw spirograph
1.5.32	Clock.java	animate a clock
1.5.33	Oscilloscope.java	simulate an oscilloscope

2 FUNCTIONS

2.1.4	ArrayEquals.java	are two integer arrays equal?
2.1.30	BlackScholes.java	Black-Scholes option valuation
2.1.32	Horner.java	Horner's method to evaluate a polynomial
2.1.33	Benford.java	Benford's law
2.1.38	Calendar.java	create a calendar
2.2.1	Gaussian.java	overloaded gaussian distribution functions
2.2.2	Hyperbolic.java	hyperbolic trig functions
2.2.4	StdRandom.java	shuffle an array of doubles
2.2.6	StdArrayIO.java	array IO methods
2.2.11	Matrix.java	matrix operations
2.2.12	MarkovSquaring.java	page rank via matrix squaring
2.2.14	StdRandom.java	exponential random variable
2.3.14	AnimatedHtree.java	animated H-tree
2.3.15	IntegerToBinary.java	integer to binary conversion
2.3.17	Permutations.java	all permutations
2.3.18	PermutationsK.java	all permutations of size k
2.3.19	Combinations.java	all combinations
2.3.20	CombinationsK.java	all combinations of size k
2.3.22	RecursiveSquares.java	recursive squares
2.3.24	GrayCode.java	Gray code
2.3.26	AnimatedHanoi.java	animated Towers of Hanoi
2.3.29	Collatz.java	Collatz function
2.3.30	BrownianIsland.java	Brownian island
2.3.31	PlasmaCloud.java	plama cloud
2.3.32	McCarthy.java	McCarthy's 91 function
2.3.33	Tree.java	fractal tree
2.4.15	PercolationDirectedNonrecursive.java	directed percolation

Last modified on July 19, 2016.