Code Complexity Overview, and an Analysis for Various Programming Languages

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Abstract

Software complexity is notoriously difficult to measure, but can have a profound impact on the performance of a software development team and the continuing robustness of a software product. Significant effort has been made for many years to attempt to measure software complexity, as this is a problem that can have significant financial impact. Software that is too complex may also be too difficult to modify, understand, or debug. Meanwhile, the problem of designing a programming language can be understood as optimizing a utility function which balances performance with simplicity[1]. In this work, I will attempt to explore some proposed methods for measuring software complexity and examine how the choice of programming language can impact the complexity of a piece of software.

1 Background

1.1 Software Complexity

Measuring software complexity is a difficult task, and significant effort has been dedicated to finding a useful measure since the advent of software engineering as a serious discipline. The problem is to find some way to analyze a given piece of code and extract a single value which determines how *complicated* that piece of code would be to understand for an experienced programmer tasked with debugging, modifying, or re-implementing it. Some efforts, such as McCabe's cyclomatic complexity (discussed in 1.1.2), have achieved broad acceptance and use in industry; however, a best solution remains elusive. In this section, I will discuss some of the methods that have been attempted, their benefits, and their drawbacks.

[1] From https://ocaml.org/about, "Programming languages matter. They affect the reliability, security, and efficiency of the code you write, as well as how easy it is to read, refactor, and extend. The languages you know can also change how you think, influencing the way you design software even when youre not using them." I agree with this

1.1.1 Lines of Code

Perhaps the simplest metric for code complexity is simply counting the number of lines of source code for the program. Source lines of code, or SLOC, assumes that the complexity of a piece of software is proportional to the number of lines of code used to write it.

1.1.2 Cyclomatic Complexity

McCabe's cyclomatic complexity (MCC) [7] describes a method for determining complexity of a program by analyzing the program as a graph. In MCC, a graph is constructed for a given program such that nodes represent sequential execution through a program, and edges represent branching statements in the program. The cyclomatic complexity is then defined as:

$$v(G) = \|E\| - \|N\| + p \tag{1}$$

Here, $\|E\|$ represents the number of edges in the graph, $\|N\|$ is the number of nodes, and p is the number of connected components in the graph.

MCC is the industry standard for analyzing code complexity [4], so clearly the metric provides value. However, MCC is not highly regarded in the literature [4]. An FMRI analysis performed by [8] indicates that there is, in fact, no correlation between the MCC value of a snippet of code and the complexity as measured in the brain. Furthermore, other research (such as [5]) indicates that it consistently and stably correlates with simply counting SLOC (a surprisingly consistent finding among the metrics discussed here).

1.1.3 DepDegree

DepDegree [2] is a complexity metric which, at a high level, attempts to tell us how many program statements the average line of code depends on. The authors claim that subjective program complexity experienced by a programmer depends at least in part on the number of distinct pieces of information that a programmer must hold in their brains at a time, so higher values on this metric should correlate to a higher subjective complexity, thus making this a valuable metric. Though they don't attempt to measure this in their own work, their hypothesis is supported to some degree by the work in [8].

1.1.4 Indentation Heuristics

Somewhat more recently, the authors of [6] proposed a heuristic metric which can be applied to nearly any code-base. They propose a metric which examines the total indentation level of a piece of code, and show that these heuristics can correlate strongly with more complex, AST-dependent measures such as MCC.

1.2 Rosetta Code

Rosetta Code [3] is an online repository where programmers submit solutions to problems in several programming languages. Because the problem and the output are defined and standardized, this repository provides a useful database of samples by which one can compare programming languages across various dimensions. For my purposes, it is useful for comparing the code complexity of solutions produced using various programming languages.

The repository contains 118,696 code samples. In total, those samples include 1225 problems, solved in 836 programming languages ranging from x86-64 assembly to very recently developed, modern languages like Zig and Nim.

2 Methods

I use data from the Rosetta Code project to perform my analysis. Data from the Rosetta Code project was compiled by [1] into a dataset of languages samples that work well for our purposes.

Due to the nature of the Rosetta Code project, I assume that these should be prototypical examples of how the language *should* be written, which should allow for a reasonable comparison without inviting noise from the quality of a codebase.

I then compute complexity across all of these short demonstrations using two language-agnostic strategies: the indentation-oriented metric inspired by [6] and implemented in [9], and a simple lines-of-code metric. These metrics are chosen because they can be computed in a language-agnostic fashion, which allows a fair comparison using a single implementation of the metric computations.

Another confounding factor in the analysis is that several of the task/language combinations in the dataset have multiple implementations. Often, this is to demonstrate that the *correct* way to implement something uses some standard library function (e.g., finding the max value of a list), but other implementations are to demonstrate how an author could implement the task without that standard library function. To accommodate this, I do two analyses.

First, I take only the highest-complexity implementation for a given task/language combination and report the resulting mean complexity across all tasks. This should indicate the amount of complexity that is induced by the programming language on its own.

Then, I take the lowest-complexity implementation. This should be a good indicator of the strength of a language's library ecosystem.

To further examine the data, I also categorize the 25 programming languages across two additional dimensions: whether they employ static or dynamic typing, and whether they are compiled or interpreted.

3 Results

Figure 1 shows the results of analyzing the complexity of software written in these various programming languages when looking only at the most- or least-complex implementation.

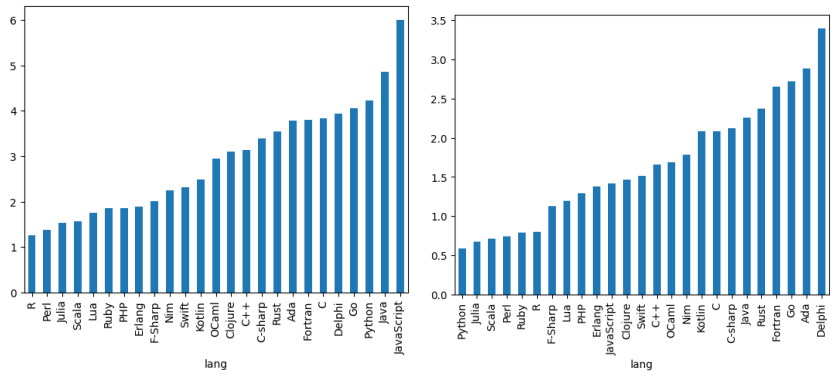

Figure 1: Mean complexities of the analysed languages, using only the most complex implementation

Figure 2, on the left, shows the results when we group the dynamically-typed languages together and compare those to the statically-typed languages. As one might expect, dynamically-typed languages grade out as a bit more simple than statically-typed languages. On the right I show the results of comparing compiled vs interpreted languages, which also provides no surprises.

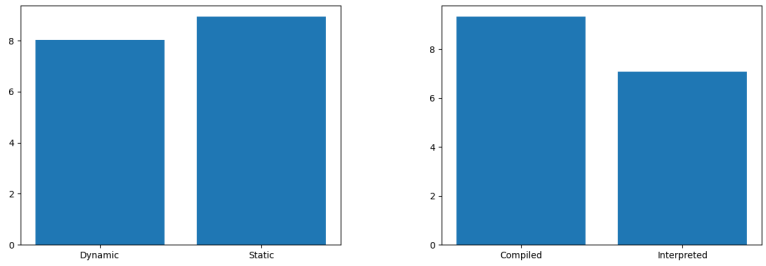

Figure 2: Complexities of statically- vs. dynamically-typed languages, and compiled vs interpreted languages

4 Limitations

The results presented here presented here apply a complexity metric to individual code files. In reality, software projects consist of multiple files which interact

in complex ways, and the true difficulty in understanding a project likely lies at least in part in the composition of those files. Thus, none of the metrics discussed here can be considered a complete representation of the complexity of a software project.

Furthermore, I intentionally limited this analysis to programming languages which are designed to be used in production systems. SLOC and indentation analysis can be very misleading when applied to other languages. For example, the following snippet of code implements "Hello, World!" the AHHH esolang:

```
AHHHHhhHHHhHHHHhHHHhHHHhHHhHHHhHHhhHHhhHHhhH
HhhHHHhhHHhhHHhhHHhhHHhhHhHhhHhhhhhhHHhhHHHhH
HHHhHHHhHHhHhHHhhHhhhHhhHhHhHhHhHhHhHhHhhhh
hhhHhHhhHhhHHhhHHhhHHhhHhHhhHhhhhhhHhHhh
hHhhHhhhhhhHhHhhhHhhHhhHHhhHHhhHHhhhhhhH
HhhHHHhHHHHhHHHHhHHHhHHhHhHhHHHHhhHhhHHHhHHHHh
HHHhhHHHHhHhHHHhHhHhHhHhHhHhHhHhHhhhhhhHHhhH
HHhHHHHhHHHHhHHHhHHhhhhhhHHhhHHHhHHHHhHHHHh
HHhHHHHhHhHhHHHHhhHhhHHHHhHHHHhHHHhhHHHHHHhh
HhhHHHHhHHHHhHHHHhHhHHHhHhHHHhHhHhhhhhhHhHhh
HhhHHhhHHhhHhHhhhHhhhhhhhHhHhhhHhhHhhHHhhH
HhhHHhhhhhhhHhHhhHhHhHhHhHhHhHhhHhhHhhhhhhhH
hHhhHhHhHhHhHhHhHhHhHhHhHhHhHhHhHhHhHhHhHhhh
hhhHHhhHHHhHHHHhHHHHhHHhHHhhHHhhhhhh!
```

This is obviously incomprehensible to anyone, but computes to a minimal score by these metrics (note that the line breaks are provided so that the snippet can fit a page, but it would run as a single line). This is an extreme example, but it serves as an example to demonstrate that a good score on these metrics does not necessarily correlate to good, readable code.

5 Conclusion

I hoped in this work to show how programming languages differ on complexity. I believe that designing a good programming language is an optimization problem which must balance readability of the code it induces against performance, security, reliability, and various other concerns.

References

[1] acmeism. Rosettacodedata. `https://github.com/acmeism/RosettaCodeData`, 2024.

[2] Dirk Beyer and Ashgan Fararooy. A simple and effective measure for complex low-level dependencies. In *2010 IEEE 18th International Conference on Program Comprehension*, pages 80–83, 2010.

[3] Rosetta Code. Rosetta code. `https://rosettacode.org`, 2024.

[4] Christof Ebert, James Cain, Giuliano Antoniol, Steve Counsell, and Phillip Laplante. Cyclomatic complexity. *IEEE Software*, 33(6):27–29, 2016.

[5] Jay Graylin, Randy K SMITH, HALE David, Nicholas A KRAFT, WARD Charles, et al. Cyclomatic complexity and lines of code: Empirical evidence of a stable linear relationship. *Journal of Software Engineering and Applications*, 2(3):137–143, 2009.

[6] Abram Hindle, Michael W Godfrey, and Richard C Holt. Reading beside the lines: Using indentation to rank revisions by complexity. *Science of Computer Programming*, 74(7):414–429, 2009.

[7] Thomas J McCabe. A complexity measure. *IEEE Transactions on software Engineering*, (4):308–320, 1976.

[8] Norman Peitek, Sven Apel, Chris Parnin, André Brechmann, and Janet Siegmund. Program comprehension and code complexity metrics: An fmri study. In *2021 IEEE/ACM 43rd International Conference on Software Engineering (ICSE)*, pages 524–536, 2021.

[9] Thoughtbot. complexity. `https://github.com/thoughtbot/complexity`, 2024.

Appendices

A Languages Included

Here I list the 25 programming languages I included in the analysis, along with the various features I identified about these programming languages.

Language	Statically- or Dynamically Typed?	Compiled or Interpreted?
JavaScript	Dynamic	Interpreted
Python	Dynamic	Interpreted
TypeScript	Dynamic	Compiled
Java	Static	Compiled
C-sharp	Static	Compiled
C++	Static	Compiled
PHP	Dynamic	Interpreted
C	Static	Compiled
Go	Static	Compiled
Rust	Static	Compiled
Kotlin	Static	Compiled
Dart	Static	Compiled
Ruby	Dynamic	Interpreted
Lua	Dynamic	Interpreted
Swift	Static	Compiled
R	Dynamic	Interpreted
Scala	Static	Compiled
Objective-C	Static	Compiled
Perl	Dynamic	Interpreted
Elixer	Dynamic	Compiled
Delphi	Static	Compiled
Haskel	Static	Compiled
Clojure	Dynamic	Compiled
Lisp	Dynamic	Interpreted
Solidity	Static	Compiled
Erlang	Dynamic	Compiled
Zig	Static	Compiled
F-Sharp	Static	Compiled
Fortran	Static	Compiled
Apex	Static	Compiled
Julia	Dynamic	Compiled
Ada	Static	Compiled
Cobol	Static	Compiled
OCaml	Static	Compiled
Crystal	Static	Compiled
Zephyr	Static	Compiled
Nim	Static	Compiled

B List of Tasks

Below is a list of all the Rosetta Code tasks used in this analysis, along with the mean complexity of their implementation across all languages.

Task	Mean Complexity
100-doors	2.902500
100-prisoners	10.441852
15-puzzle-game	15.096774
15-puzzle-solver	16.341600
2048	26.700769
21-game	13.697200
24-game	10.692143
24-game-Solve	12.814615
4-rings-or-4-squares-puzzle	8.267931
9-billion-names-of-God-the-integer	5.396129
99-bottles-of-beer	3.131176
A+B	1.091296
ABC-problem	5.786923
ADFGVX-cipher	10.665556
AKS-test-for-primes	6.154118
ASCII-art-diagram-converter	14.273077
AVL-tree	48.189286
Abbreviations-automatic	7.345000
Abbreviations-easy	6.787500
Abbreviations-simple	9.850000
Abelian-sandpile-model	9.075652
Abelian-sandpile-model-Identity	12.236000
Abstract-type	2.150909
Abundant-deficient-and-perfect-number-classifications	3.872895
Abundant-odd-numbers	7.352727
Accumulator-factory	3.047292
Achilles-numbers	10.296667
Ackermann-function	5.237903
Active-Directory-Connect	1.164000
Active-Directory-Search-for-a-user	1.857778
Active-object	5.552381
Add-a-variable-to-a-class-instance-at-runtime	1.790909
Additive-primes	4.709524
Address-of-a-variable	0.741714
Algebraic-data-types	9.011875
Align-columns	6.743939
Aliquot-sequence-classifications	9.672778
Almkvist-Giullera-formula-for-pi	4.543077
Almost-prime	4.871852
Amb	5.444500

Task	Mean Complexity
Amicable-pairs	4.693529
Anagrams	4.800789
Anagrams-Deranged-anagrams	5.901071
Angle-difference-between-two-bearings	3.621154
Angles-geometric-normalization-and-conversion	7.497895
Animate-a-pendulum	4.297931
Animation	4.291111
Anonymous-recursion	2.540189
Anti-primes	3.807500
Append-a-record-to-the-end-of-a-text-file	6.704762
Apply-a-callback-to-an-array	1.044923
Apply-a-digital-filter-direct-form-II-transposed-	6.268667
Approximate-equality	2.647000
Arbitrary-precision-integers-included-	1.281379
Archimedean-spiral	2.725217
Arena-storage-pool	2.429130
Arithmetic-Complex	3.310909
Arithmetic-Integer	1.148710
Arithmetic-Rational	7.806296
Arithmetic-derivative	5.265000
Arithmetic-evaluation	9.345000
Arithmetic-geometric-mean	2.920571
Arithmetic-geometric-mean-Calculate-Pi	3.074091
Arithmetic-numbers	7.386429
Array-concatenation	1.324634
Array-length	1.039474
Arrays	0.336774
Ascending-primes	4.742105
Assertions	0.647619
Associative-array-Creation	0.505443
Associative-array-Iteration	1.596757
Associative-array-Merging	1.616071
Atomic-updates	8.056522
Attractive-numbers	8.116364
Average-loop-length	6.184211
Averages-Arithmetic-mean	1.908261
Averages-Mean-angle	2.549643
Averages-Mean-time-of-day	4.483750

Task	Mean Complexity
Averages-Median	3.244865
Averages-Mode	4.063889
Averages-Pythagorean-means	2.901842
Averages-Root-mean-square	1.637879
Averages-Simple-moving-average	4.544286
B-zier-curves-Intersections	22.532000
Babbage-problem	2.517353
Babylonian-spiral	7.703750
Balanced-brackets	4.065200
Balanced-ternary	15.507273
Barnsley-fern	5.200800
Base64-decode-data	1.938077
Bell-numbers	6.791739
Benfords-law	4.686250
Bernoulli-numbers	5.044800
Best-shuffle	6.971290
Bifid-cipher	7.690833
Bin-given-limits	4.918333
Binary-digits	2.509565
Binary-search	4.130645
Binary-strings	1.625000
Bioinformatics-Global-alignment	12.902857
Bioinformatics-Sequence-mutation	9.928667
Bioinformatics-base-count	5.061905
Biorhythms	5.793125
Bitcoin-address-validation	6.490000
Bitmap	3.198500
Bitmap-B-zier-curves-Cubic	3.233810
Bitmap-B-zier-curves-Quadratic	3.809231
Bitmap-Bresenhams-line-algorithm	5.030370
Bitmap-Flood-fill	5.007647
Bitmap-Histogram	4.059200
Bitmap-Midpoint-circle-algorithm	2.278696
Bitmap-PPM-conversion-through-a-pipe	2.335455
Bitmap-Read-a-PPM-file	6.347600
Bitmap-Read-an-image-through-a-pipe	2.194167
Bitmap-Write-a-PPM-file	3.816000
Bitwise-IO	7.730741
Bitwise-operations	1.792632

Task	Mean Complexity
Blum-integer	7.707273
Boolean-values	0.611500
Box-the-compass	4.254444
Boyer-Moore-string-search	16.760000
Brace-expansion	13.363913
Brazilian-numbers	10.983200
Break-OO-privacy	1.723243
Brilliant-numbers	7.750769
Brownian-tree	7.274643
Bulls-and-cows	7.796129
Bulls-and-cows-Player	8.655417
Burrows-Wheeler-transform	8.685333
CRC-32	2.821351
CSV-data-manipulation	4.956842
CSV-to-HTML-translation	3.417119
CUSIP	9.085833
Caesar-cipher	3.789500
Calculating-the-value-of-e	2.004872
Calendar	10.436429
Calendar—for-REAL-programmers	6.527778
Calkin-Wilf-sequence	5.330833
Call-a-foreign-language-function	1.190455
Call-a-function	0.936827
Call-a-function-in-a-shared-library	2.295476
Call-an-object-method	1.426774
Camel-case-and-snake-case	6.988182
Canny-edge-detector	16.345000
Canonicalize-CIDR	4.160000
Cantor-set	8.863200
Carmichael-3-strong-pseudoprimes	6.836667
Cartesian-product-of-two-or-more-lists	3.992000
Case-sensitivity-of-identifiers	0.912963
Casting-out-nines	4.182857
Catalan-numbers	5.184706
Catalan-numbers-Pascals-triangle	2.940417
Catamorphism	1.583000
Catmull-Clark-subdivision-surface	23.932000
Chaocipher	6.351905

Task	Mean Complexity
Chaos-game	4.564737
Character-codes	0.654667
Chat-server	14.664375
Check-Machin-like-formulas	7.769091
Check-input-device-is-a-terminal	1.834167
Check-output-device-is-a-terminal	1.491053
Check-that-file-exists	2.031667
Checkpoint-synchronization	7.344500
Chernicks-Carmichael-numbers	11.427000
Cheryls-birthday	8.638095
Chinese-remainder-theorem	5.402258
Chinese-zodiac	6.236000
Cholesky-decomposition	5.803929
Chowla-numbers	8.323333
Church-numerals	7.191333
Circles-of-given-radius-through-two-points	6.546957
Circular-primes	9.370000
Cistercian-numerals	20.597143
Classes	3.132632
Closest-pair-problem	7.308788
Closures-Value-capture	1.440377
Collections	0.601316
Color-of-a-screen-pixel	1.557727
Color-quantization	12.108000
Color-wheel	5.722500
Colorful-numbers	9.239091
Colour-bars-Display	2.571250
Colour-pinstripe-Display	3.913571
Colour-pinstripe-Printer	5.612000
Combinations	3.984561
Combinations-and-permutations	4.871579
Combinations-with-repetitions	4.510571
Comma-quibbling	3.494545
Command-line-arguments	1.040714
Commatizing-numbers	5.303846
Comments	0.674074
Compare-a-list-of-strings	2.120750
Compare-length-of-two-strings	3.173667
Compare-sorting-algorithms-performance	9.738095
Compile-time-calculation	1.538750
Compiler-AST-interpreter	26.528000

Task	Mean Complexity
Compiler-code-generator	35.161111
Compiler-lexical-analyzer	35.357500
Compiler-syntax-analyzer	34.838889
Compiler-virtual-machine-interpreter	33.906667
Composite-numbers-k-with-no-single-digit-factors-whose-factors-are-all-substrings-of-k	4.196923
Compound-data-type	1.066111
Concurrent-computing	2.026047
Conditional-structures	1.850112
Conjugate-transpose	10.954444
Consecutive-primes-with-ascending-or-descending-differences	6.143571
Constrained-genericity	1.657500
Constrained-random-points-on-a-circle	5.274286
Continued-fraction	4.068333
Continued-fraction-Arithmetic-Construct-from-rational-number	3.311852
Continued-fraction-Arithmetic-G-matrix-ng-continued-fraction-n-	13.390455
Convert-decimal-number-to-rational	4.302857
Convert-seconds-to-compound-duration	5.123548
Convex-hull	8.641304
Conways-Game-of-Life	11.118333
Copy-a-string	0.432857
Copy-stdin-to-stdout	1.327619
Count-in-factors	4.401481
Count-in-octal	1.710968
Count-occurrences-of-a-substring	1.781500
Count-the-coins	3.587500
Cramers-rule	8.186842
Create-a-file	1.751000
Create-a-file-on-magnetic-tape	1.323333
Create-a-two-dimensional-array-at-runtime	1.482778
Create-an-HTML-table	5.117391

Task	Mean Complexity
Create-an-object-at-a-given-address	0.875000
Cuban-primes	5.758000
Cullen-and-Woodall-numbers	2.924286
Cumulative-standard-deviation	2.960930
Currency	2.760000
Currying	2.438163
Curzon-numbers	5.883636
Cut-a-rectangle	9.358889
Cyclops-numbers	7.115789
Cyclotomic-polynomial	40.203000
DNS-query	2.030000
Damm-algorithm	2.931364
Date-format	1.615333
Date-manipulation	2.208214
Day-of-the-week	2.464000
De-Bruijn-sequences	9.827143
Deal-cards-for-FreeCell	6.541923
Death-Star	8.825000
Deceptive-numbers	4.030667
Deconvolution-1D	3.943182
Deconvolution-2D+	21.566667
Deepcopy	3.319615
Define-a-primitive-data-type	3.690000
Delegates	3.743125
Delete-a-file	0.974848
Demings-funnel	7.318000
Department-numbers	3.700556
Descending-primes	4.355385
Detect-division-by-zero	2.522581
Determinant-and-permanent	6.353077
Determine-if-a-string-has-all-the-same-characters	5.467667
Determine-if-a-string-has-all-unique-characters	8.126538
Determine-if-a-string-is-collapsible	4.043750
Determine-if-a-string-is-numeric	1.991552
Determine-if-a-string-is-squeezable	4.588500
Determine-if-only-one-instance-is-running	3.091538
Determine-if-two-triangles-overlap	8.343333

Task	Mean Complexity
Determine-sentence-type	4.190909
Dice-game-probabilities	4.881000
Digital-root	4.068462
Digital-root-Multiplicative-digital-root	4.457778
Dijkstras-algorithm	10.282000
Dinesmans-multiple-dwelling-problem	4.743611
Dining-philosophers	10.190741
Disarium-numbers	4.324444
Discordian-date	8.014400
Display-a-linear-combination	3.944074
Display-an-outline-as-a-nested-table	32.773750
Distance-and-Bearing	6.272222
Distributed-programming	2.504865
Distribution-of-0-digits-in-factorial-series	5.074667
Diversity-prediction-theorem	6.452632
Documentation	1.753182
Dominoes	8.518000
Doomsday-rule	6.803333
Dot-product	2.546389
Doubly-linked-list-Definition	7.554545
Doubly-linked-list-Element-definition	2.255806
Doubly-linked-list-Element-insertion	2.456897
Doubly-linked-list-Traversal	4.816111
Dragon-curve	5.791471
Draw-a-clock	5.790769
Draw-a-cuboid	5.592381
Draw-a-pixel	2.109583
Draw-a-rotating-cube	7.309333
Draw-a-sphere	11.086667
Duffinian-numbers	5.666667
Dutch-national-flag-problem	5.435357
Dynamic-variable-names	1.159474
EKG-sequence-convergence	6.266000
Earliest-difference-between-prime-gaps	6.373333
Eban-numbers	7.090588
Echo-server	4.797857
Eertree	9.999167

Task	Mean Complexity
Egyptian-division	4.732500
Element-wise-operations	6.391053
Elementary-cellular-automaton	4.830952
Elementary-cellular-automaton-Infinite-length	5.874444
Elementary-cellular-automaton-Random-number-generator	3.543077
Elliptic-Curve-Digital-Signature-Algorithm	18.103750
Elliptic-curve-arithmetic	7.860000
Emirp-primes	6.643448
Empty-directory	2.032800
Empty-program	0.305185
Empty-string	1.127273
Enforced-immutability	0.765435
Entropy	3.324848
Entropy-Narcissist	3.018125
Enumerations	0.913333
Environment-variables	0.764483
Equal-prime-and-composite-sums	6.172727
Equilibrium-index	3.515405
Erd-s-Nicolas-numbers	3.800000
Erd-s-Selfridge-categorization-of-primes	10.017500
Esthetic-numbers	12.825000
Ethiopian-multiplication	4.516389
Euclid-Mullin-sequence	4.515455
Euler-method	3.561481
Eulers-constant-0.5772...	2.245625
Eulers-identity	0.854000
Eulers-sum-of-powers-conjecture	6.326410
Evaluate-binomial-coefficients	2.770233
Even-or-odd	1.485581
Events	2.809000
Evolutionary-algorithm	6.770968
Exceptions	1.903636
Exceptions-Catch-an-exception-thrown-in-a-nested-call	5.002917
Executable-library	3.611154
Execute-Brain-Execute-Computer-Zero	9.494211 10.738182
Execute-HQ9+	5.376667
Execute-SNUSP	6.842500

Task	Mean Complexity
Execute-a-Markov-algorithm	6.743200
Execute-a-system-command	1.433846
Exponentiation-operator	3.808387
Exponentiation-order	0.800833
Exponentiation-with-infix-operators-in-or-operating-on-the-base	1.740000
Extend-your-language	4.287949
Extensible-prime-generator	5.594151
Extreme-floating-point-values	1.295185
FASTA-format	4.203913
FTP	4.243333
Faces-from-a-mesh	11.085000
Factorial	2.281720
Factorial-base-numbers-indexing-permutations-of-a-collection	8.149091
Factorial-primes	5.112667
Factorions	4.734000
Factors-of-a-Mersenne-number	7.591905
Factors-of-an-integer	2.951064
Fairshare-between-two-and-more	8.428824
Farey-sequence	6.640526
Fast-Fourier-transform	4.080294
Faulhabers-formula	17.010714
Faulhabers-triangle	15.251250
Feigenbaum-constant-calculation	2.962632
Fermat-numbers	10.891429
Fibonacci-n-step-number-sequences	4.446216
Fibonacci-sequence	2.408533
Fibonacci-word	5.328000
Fibonacci-word-fractal	5.376667
File-extension-is-in-extensions-list	4.027037
File-input-output	2.281864
File-modification-time	1.724828
File-size	1.140000
File-size-distribution	7.799231
Filter	1.602128
Find-Chess960-starting-position-identifier	6.670000
Find-common-directory-path	3.606667

Task	Mean Complexity
Find-duplicate-files	11.078000
Find-if-a-point-is-within-a-triangle	7.188889
Find-largest-left-truncatable-prime-in-a-given-base	6.070909
Find-limit-of-recursion	1.822500
Find-palindromic-numbers-in-both-binary-and-ternary-bases	8.116500
Find-the-intersection-of-a-line-with-a-plane	4.612778
Find-the-intersection-of-two-lines	4.584800
Find-the-last-Sunday-of-each-month	4.413750
Find-the-missing-permutation	2.913721
First-class-environments	5.980000
First-class-functions	2.826250
First-class-functions-Use-numbers-analogously	1.405600
First-perfect-square-in-base-n-with-n-unique-digits	10.336471
First-power-of-2-that-has-leading-decimal-digits-of-12	6.385000
Five-weekends	4.632258
Fivenum	4.773333
Fixed-length-records	2.695882
FizzBuzz	2.268699
Flatten-a-list	3.835667
Flipping-bits-game	15.360526
Flow-control-structures	2.479375
Floyd-Warshall-algorithm	12.054091
Floyds-triangle	5.178621
Forest-fire	10.333333
Fork	2.131333
Formal-power-series	11.382609
Formatted-numeric-output	0.614194
Fortunate-numbers	5.324000
Forward-difference	3.581212
Four-bit-adder	6.597059
Four-is-magic	7.450476
Four-is-the-number-of-letters-in-the-...	18.381000
Fractal-tree	2.988261
Fraction-reduction	14.872143

Task	Mean Complexity
Fractran	8.974444
Function-composition	2.042157
Function-definition	0.833385
Function-frequency	9.974286
Function-prototype	2.590400
Functional-coverage-tree	20.903077
Fusc-sequence	6.007200
GUI-Maximum-window-dimensions	1.291667
GUI-component-interaction	5.290667
GUI-enabling-disabling-of-controls	6.686957
Galton-box-animation	12.702857
Gamma-function	4.012069
Gapful-numbers	5.208095
Gauss-Jordan-matrix-inversion	10.317895
Gaussian-elimination	7.704516
General-FizzBuzz	4.180882
Generate-Chess960-starting-position	4.423077
Generate-lower-case-ASCII-alphabet	1.574865
Generate-random-chess-position	9.431333
Generator-Exponential	5.600256
Generic-swap	0.985957
Get-system-command-output	1.190435
Giuga-numbers	5.584667
Globally-replace-text-in-several-files	3.507143
Go-Fish	7.880000
Goldbachs-comet	3.633333
Golden-ratio-Convergence	1.717857
Gotchas	0.217143
Graph-colouring	15.795000
Gray-code	3.256571
Grayscale-image	3.394848
Greatest-common-divisor	2.203125
Greatest-element-of-a-list	2.095000
Greatest-subsequential-sum	3.370556
Greedy-algorithm-for-Egyptian-fractions	14.299375
Greyscale-bars-Display	2.939524
Guess-the-number	2.454231

Task	Mean Complexity
Guess-the-number-With-feedback	4.017143
Guess-the-number-With-feedback-player-	5.374231
HTTP	1.335208
HTTPS	1.028065
HTTPS-Authenticated	1.874706
HTTPS-Client-authenticated	1.368333
Hailstone-sequence	4.565400
Halt-and-catch-fire	0.216667
Hamming-numbers	6.943000
Handle-a-signal	2.946452
Happy-numbers	3.659583
Harmonic-series	4.209412
Harshad-or-Niven-series	4.309286
Hash-from-two-arrays	1.399487
Hash-join	4.635455
Haversine-formula	1.931000
Hello-world-Graphical	1.208036
Hello-world-Line-printer	1.230400
Hello-world-Newbie	0.513077
Hello-world-Newline-omission	0.478621
Hello-world-Standard-error	0.326364
Hello-world-Text	0.298814
Hello-world-Web-server	2.651613
Here-document	1.109286
Heronian-triangles	8.612727
Hex-words	7.585556
Hickerson-series-of-almost-integers	3.440625
Higher-order-functions	1.478542
Hilbert-curve	8.761905
History-variables	3.990000
Hofstadter-Conway-$10-000-sequence	4.527917
Hofstadter-Figure-Figure-sequences	4.644138
Hofstadter-Q-sequence	3.063056
Holidays-related-to-Easter	4.982273
Home-primes	9.686250
Honeycombs	10.621875
Horizontal-sundial-calculations	1.828889
Horners-rule-for-polynomial-evaluation	1.740526

Task	Mean Complexity
Host-introspection	1.177879
Hostname	0.502903
Hough-transform	7.315000
Huffman-coding	11.587097
Humble-numbers	7.512400
Hunt-the-Wumpus	20.332667
I-before-E-except-after-C	4.877600
IBAN	5.078462
ISBN13-check-digit	4.264286
Identity-matrix	2.450435
Idiomatically-determine-all-the-characters-that-can-be-used-for-symbols	2.450769
Idiomatically-determine-all-the-lowercase-and-uppercase-letters	2.531875
Im-a-software-engineer-get-me-out-of-here	13.916000
Image-convolution	6.499500
Image-noise	5.617037
Imaginary-base-numbers	15.000000
Include-a-file	0.363902
Increasing-gaps-between-consecutive-Niven-numbers	4.496667
Increment-a-numerical-string	1.047647
Index-finite-lists-of-positive-integers	2.988333
Infinity	0.758696
Inheritance-Multiple	1.907742
Inheritance-Single	2.780000
Input-loop	1.831190
Integer-comparison	2.265000
Integer-overflow	1.238462
Integer-sequence	1.316190
Interactive-programming-repl-	0.621333
Intersecting-number-wheels	9.045000
Introspection	1.938571
Inverted-index	9.846129
Inverted-syntax	1.000417
Isograms-and-heterograms	3.712000
Isqrt-integer-square-root-of-X	5.423158
Iterated-digits-squaring	5.037143
JSON	2.269024
Jacobi-symbol	5.236250
Jacobsthal-numbers	7.864375

Task	Mean Complexity
Jaro-Winkler-distance	11.740000
Jaro-similarity	8.136111
Jensens-Device	2.340937
Jewels-and-stones	1.892963
Jordan-P-lya-numbers	9.910769
JortSort	2.238077
Josephus-problem	3.242500
Joystick-position	5.947143
Juggler-sequence	5.868182
Julia-set	4.728966
Jump-anywhere	3.140357
K-d-tree	12.379286
K-means++-clustering	25.553333
Kaprekar-numbers	3.980968
Kernighans-large-earthquake-problem	2.675714
Keyboard-input-Flush-the-keyboard-buffer	2.453529
Keyboard-input-Keypress-check	3.047895
Keyboard-input-Obtain-a-Y-or-N-response	3.402143
Keyboard-macros	4.111429
Knapsack-problem-0-1	5.511500
Knapsack-problem-Bounded	6.346364
Knapsack-problem-Continuous	4.850714
Knapsack-problem-Unbounded	4.892917
Knights-tour	12.398125
Knuth-shuffle	3.096512
Knuths-algorithm-S	4.780741
Knuths-power-tree	6.072727
Koch-curve	6.448750
Kolakoski-sequence	8.189231
Kosaraju	7.632308
Kronecker-product	5.733214
Kronecker-product-based-fractals	8.318421
LU-decomposition	10.708571
LZW-compression	7.800000
Lah-numbers	5.295000
Langtons-ant	6.803103
Largest-int-from-concatenated-ints	3.081935
Largest-number-divisible-by-its-digits	5.939000

Task	Mean Complexity
Largest-proper-divisor-of-n	3.678947
Last-Friday-of-each-month	3.504375
Last-letter-first-letter	6.688000
Latin-Squares-in-reduced-form	12.826154
Law-of-cosines—triples	7.317500
Leap-year	1.323889
Least-common-multiple	2.508788
Left-factorials	4.974138
Legendre-prime-counting-function	6.642222
Leonardo-numbers	3.492917
Letter-frequency	3.740233
Levenshtein-distance	5.106383
Levenshtein-distance-Alignment	5.868462
Linear-congruential-generator	4.048710
List-comprehensions	3.116000
List-rooted-trees	10.712857
Literals-Floating-point	0.327647
Literals-Integer	0.638000
Literals-String	0.430000
Logical-operations	1.329630
Logistic-curve-fitting-in-epidemiology	5.174167
Long-literals-with-continuations	1.141538
Long-multiplication	6.325294
Long-primes	4.107059
Long-year	3.022857
Longest-common-subsequence	4.217083
Longest-common-substring	5.930000
Longest-increasing-subsequence	6.148966
Longest-string-challenge	5.294400
Look-and-say-sequence	2.884314
Loop-over-multiple-arrays-simultaneously	1.463091
Loops-Break	2.503226
Loops-Continue	2.189189
Loops-Do-while	1.936140
Loops-Downward-for	0.978205
Loops-For	1.772979
Loops-For-with-a-specified-step	1.804286
Loops-Foreach	1.104643
Loops-Increment-loop-index-within-loop-body	5.197727
Loops-Infinite	0.673611

Task	Mean Complexity
Loops-N-plus-one-half	1.754348
Loops-Nested	3.588571
Loops-While	1.521395
Loops-With-multiple-ranges	3.837222
Loops-Wrong-ranges	3.685294
Lucas-Lehmer-test	4.742188
Lucky-and-even-lucky-numbers	13.745294
Ludic-numbers	6.779500
Luhn-test-of-credit-card-numbers	3.215455
Lychrel-numbers	11.866250
M-bius-function	6.949375
MD4	4.573043
MD5	1.813793
MD5-Implementation	9.886364
Machine-code	2.010000
Mad-Libs	5.310952
Magic-8-ball	2.484000
Magic-constant	4.278182
Magic-squares-of-doubly-even-order	7.726667
Magic-squares-of-odd-order	8.805000
Magic-squares-of-singly-even-order	11.100833
Magnanimous-numbers	7.498235
Main-step-of-GOST-28147-89	6.956667
Make-directory-path	2.167273
Man-or-boy-test	3.609796
Mandelbrot-set	4.555593
Map-range	2.607000
Mastermind	16.465000
Matrix-chain-multiplication	6.330417
Matrix-digital-rain	8.957333
Matrix-exponentiation-operator	7.632692
Matrix-multiplication	5.207750
Matrix-transposition	4.285918
Maximum-triangle-path-sum	3.034286
Mayan-calendar	8.422500
Mayan-numerals	11.224615
Maze-generation	9.851515
Maze-solving	16.165294
McNuggets-problem	4.296429
Median-filter	6.499286
Meissel-Mertens-constant	3.331250

Task	Mean Complexity
Memory-allocation	1.253529
Memory-layout-of-a-data-structure	1.792857
Menu	3.788800
Merge-and-aggregate-datasets	5.287692
Mertens-function	7.237692
Metallic-ratios	4.930909
Metaprogramming	2.058667
Metered-concurrency	5.657778
Metronome	4.387647
Mian-Chowla-sequence	5.303636
Middle-three-digits	4.931111
Miller-Rabin-primality-test	7.006222
Mind-boggling-card-trick	5.125882
Minesweeper-game	31.507647
Minimal-steps-down-to-1	12.538182
Minimum-multiple-of-m-where-digital-sum-equals-m	3.572500
Minimum-positive-multiple-in-base-10-using-only-0-and-1	8.971250
Minkowski-question-mark-function	11.235556
Modified-random-distribution	5.390000
Modular-arithmetic	8.492941
Modular-exponentiation	4.646667
Modular-inverse	2.729091
Monads-List-monad	3.615909
Monads-Maybe-monad	4.802381
Monads-Writer-monad	4.190833
Monte-Carlo-methods	2.948182
Monty-Hall-problem	3.585278
Morse-code	5.048800
Motzkin-numbers	3.967692
Mouse-position	1.954762
Move-to-front-algorithm	6.070476
Multi-base-primes	10.849000
Multi-dimensional-array	2.049744
Multifactorial	2.523235
Multiple-distinct-objects	0.972250
Multiple-regression	7.260417
Multiplication-tables	5.391026
Multiplicative-order	8.985000
Multisplit	4.759630
Munchausen-numbers	3.464000

Task	Mean Complexity
Munching-squares	3.024737
Musical-scale	2.462500
Mutex	1.622500
Mutual-recursion	2.631562
N-queens-problem	6.920492
N-smooth-numbers	13.120000
Named-parameters	2.204651
Naming-conventions	1.240500
Narcissist	1.252632
Narcissistic-decimal-number	5.475806
Natural-sorting	12.996111
Nautical-bell	5.722000
Negative-base-numbers	5.971765
Nested-function	2.398000
Nested-templated-data	4.399000
Next-highest-int-from-digits	8.595000
Nim-game	4.601500
Non-continuous-subsequences	3.795714
Non-decimal-radices-Convert	2.525000
Non-decimal-radices-Input	0.541795
Non-decimal-radices-Output	1.123333
Non-transitive-dice	11.150769
Nonoblock	6.569375
Nonogram-solver	12.836667
Nth	3.424706
Nth-root	3.419697
Null-object	0.725758
Number-names	8.854839
Number-reversal-game	4.901875
Numbers-which-are-not-the-sum-of-distinct-squares	5.049000
Numbers-which-are-the-cube-roots-of-the-product-of-their-proper-divisors	5.471429
Numbers-with-equal-rises-and-falls	4.839286
Numeric-error-propagation	6.141429
Numerical-and-alphabetical-suffixes	11.341667
Numerical-integration	6.714848
Numerical-integration-Gauss-Legendre-Quadrature	7.877895
OLE-automation	2.446667
Object-serialization	5.224286

Task	Mean Complexity
Odd-word-problem	5.434000
Old-Russian-measure-of-length	4.747857
Old-lady-swallowed-a-fly	2.910833
One-dimensional-cellular-automata	4.683158
One-of-n-lines-in-a-file	3.697500
One-time-pad	20.565000
OpenGL	3.262500
OpenWebNet-password	11.270000
Optional-parameters	4.604000
Order-by-pair-comparisons	2.522222
Order-disjoint-list-items	5.481875
Order-two-numerical-lists	2.065000
Ordered-partitions	7.609583
Ordered-words	3.922059
Ormiston-triples	8.175000
Own-digits-power-sum	6.702222
P-Adic-numbers-basic	26.784000
P-Adic-square-roots	24.320000
P-value-correction	28.286000
Padovan-n-step-number-sequences	5.320000
Padovan-sequence	7.768333
Palindrome-dates	4.646087
Palindrome-detection	2.209254
Palindromic-gapful-numbers	6.612500
Pancake-numbers	4.755263
Pangram-checker	2.813529
Paraffins	7.669286
Parallel-brute-force	8.265714
Parallel-calculations	4.907200
Parameterized-SQL-statement	2.298125
Parametric-polymorphism	2.951034
Parse-an-IP-Address	10.073889
Parsing-RPN-calculator-algorithm	6.754074
Parsing-RPN-to-infix-conversion	8.161875
Parsing-Shunting-yard-algorithm	12.103333
Partial-function-application	2.664231
Particle-fountain	15.437143
Partition-an-integer-x-into-n-primes	9.651667
Partition-function-P	5.461667

Task	Mean Complexity
Pascal-matrix-generation	9.517391
Pascals-triangle	4.110702
Pascals-triangle-Puzzle	6.043500
Password-generator	7.238333
Pathological-floating-point-problems	4.645667
Peaceful-chess-queen-armies	20.200588
Peano-curve	5.664615
Pell-numbers	8.652500
Pells-equation	4.095625
Penneys-game	7.873889
Pentagram	3.955000
Pentomino-tiling	16.483333
Percentage-difference-between-images	3.175769
Percolation-Bond-percolation	12.155000
Percolation-Mean-cluster-density	11.628889
Percolation-Mean-run-density	5.237000
Percolation-Site-percolation	9.781818
Perfect-numbers	2.492500
Perfect-shuffle	5.599600
Perfect-totient-numbers	6.961111
Periodic-table	6.445556
Peripheral-drift-illusion	4.328333
Perlin-noise	6.420714
Permutation-test	4.077826
Permutations	4.174667
Permutations-Derangements	6.217000
Permutations-Rank-of-a-permutation	6.617333
Permutations-by-swapping	6.152308
Pernicious-numbers	4.865652
Phrase-reversals	3.338889
Pi	3.963429
Pick-random-element	0.884231
Pierpont-primes	8.020625
Pig-the-dice-game	8.145833
Pig-the-dice-game-Player	11.254667
Pinstripe-Display	4.067143
Pinstripe-Printer	4.875000
Pisano-period	12.980000
Plasma-effect	5.778333
Play-recorded-sounds	2.930769

Task	Mean Complexity
Playfair-cipher	15.282000
Playing-cards	5.882195
Plot-coordinate-pairs	2.766071
Pointers-and-references	0.503636
Poker-hand-analyser	12.870000
Polymorphic-copy	3.463600
Polymorphism	4.466765
Polynomial-long-division	10.273226
Polynomial-regression	1.447419
Polyspiral	4.270000
Population-count	4.240833
Power-set	2.643881
Pragmatic-directives	0.729375
Price-fraction	2.543438
Primality-by-Wilsons-theorem	4.169412
Primality-by-trial-division	2.715957
Prime-conspiracy	5.711364
Prime-decomposition	4.709608
Prime-numbers-whose-neighboring-pairs-are-tetraprimes	14.900000
Prime-triangle	9.956923
Primes—allocate-descendants-to-their-ancestors	11.755000
Primorial-numbers	5.607083
Priority-queue	5.195532
Probabilistic-choice	5.414400
Problem-of-Apollonius	3.153636
Program-name	1.587500
Program-termination	1.522791
Proper-divisors	5.794167
Pseudo-random-numbers-Combined-recursive-generator-MRG32k3a	3.955000
Pseudo-random-numbers-Middle-square-method	2.088571
Pseudo-random-numbers-PCG32	4.213333
Pseudo-random-numbers-Splitmix64	3.906429
Pseudo-random-numbers-Xorshift-star	3.757222
Pythagoras-tree	3.675294
Pythagorean-quadruples	5.606364

Task	Mean Complexity
Pythagorean-triples	4.528387
QR-decomposition	9.956000
Quaternion-type	5.565294
Queue-Definition	4.137708
Queue-Usage	1.161034
Quickselect-algorithm	6.055172
Quine	0.436234
Quoting-constructs	1.155385
RIPEMD-160	3.627917
RPG-attributes-generator	5.306250
RSA-code	3.995294
Radical-of-an-integer	7.288889
Ramanujan-primes-twins	9.961250
Ramanujans-constant	2.258889
Ramer-Douglas-Peucker-line-simplification	5.041875
Random-Latin-squares	11.025714
Random-number-generator-device-	1.728333
Random-number-generator-included-	0.855000
Random-numbers	1.755625
Random-sentence-from-book	7.440000
Range-consolidation	10.940000
Range-expansion	6.057742
Range-extraction	5.480000
Ranking-methods	9.192381
Rare-numbers	22.071579
Rate-counter	4.118333
Ray-casting-algorithm	8.895484
Read-a-configuration-file	7.398148
Read-a-file-character-by-character-UTF8	4.421765
Read-a-file-line-by-line	2.106383
Read-a-specific-line-from-a-file	3.598182
Read-entire-file	0.981552
Real-constants-and-functions	0.435714
Recamans-sequence	6.511579
Record-sound	3.699091
Reduced-row-echelon-form	10.042692
Reflection-Get-source	1.220833
Reflection-List-methods	4.178235
Reflection-List-properties	3.348462
Regular-expressions	1.247500

Task	Mean Complexity
Remove-duplicate-elements	2.183438
Remove-lines-from-a-file	4.268077
Rename-a-file	1.157500
Rendezvous	9.428462
Rep-string	4.322692
Repeat	2.963939
Repeat-a-string	0.809180
Repunit-primes	2.236667
Resistor-mesh	10.474615
Respond-to-an-unknown-method-call	3.303571
Retrieve-and-search-chat-history	4.886000
Return-multiple-values	1.832955
Reverse-a-string	1.403438
Reverse-words-in-a-string	2.093750
Rhonda-numbers	11.062222
Rock-paper-scissors	8.659000
Roman-numerals-Decode	3.886458
Roman-numerals-Encode	3.762105
Roots-of-a-function	4.002813
Roots-of-a-quadratic-function	3.791923
Roots-of-unity	2.949048
Rosetta-Code-Count-examples	7.614762
Rosetta-Code-Find-bare-lang-tags	8.837273
Rosetta-Code-Find-unimplemented-tasks	5.666364
Rosetta-Code-Fix-code-tags	3.087143
Rosetta-Code-Rank-languages-by-number-of-users	3.952000
Rosetta-Code-Rank-languages-by-popularity	8.468000
Rot-13	3.156053
Run-length-encoding	4.141429
Runge-Kutta-method	4.030435
Runtime-evaluation	1.254211
Runtime-evaluation-In-an-environment	1.706364
Ruth-Aaron-numbers	9.190000
S-expressions	12.651316
SEDOLs	5.760000
SHA-1	2.641200
SHA-256	3.203704
SHA-256-Merkle-tree	6.835000

Task	Mean Complexity
SOAP	1.721429
SQL-based-authentication	8.417692
Safe-addition	2.347778
Safe-primes-and-unsafe-primes	5.070870
Sailors-coconuts-and-a-monkey-problem	4.208462
Same-fringe	7.984211
Scope-Function-names-and-labels	2.981667
Scope-modifiers	1.267097
Search-a-list	3.216190
Search-a-list-of-records	4.495806
Search-in-paragraphs-text	3.718571
Secure-temporary-file	1.076923
Selectively-replace-multiple-instances-of-a-character-within-a-string	3.595000
Self-describing-numbers	3.849167
Self-numbers	9.056250
Semiprime	3.263077
Semordnilap	5.155312
Send-an-unknown-method-call	2.651875
Send-email	3.086400
Sequence-of-non-squares	3.378621
Sequence-of-primes-by-trial-division	3.726400
Sequence-of-primorial-primes	10.572105
Sequence:-nth-number-with-exactly-n-divisors	12.016667
Sequence:-smallest-number-greater-than-previous-term-with-exactly-n-divisors	4.171176
Sequence:-smallest-number-with-exactly-n-divisors	7.310588
Set	3.359167
Set-consolidation	6.629600
Set-of-real-numbers	10.203182
Set-puzzle	9.082222
Set-right-adjacent-bits	5.890000
Seven-sided-dice-from-five-sided-dice	3.509583
Sexy-primes	6.465294
Shell-one-liner	0.045517

Task	Mean Complexity
Shoelace-formula-for-polygonal-area	3.537083
Short-circuit-evaluation	3.045862
Shortest-common-supersequence	5.055833
Show-ASCII-table	4.293226
Show-the-epoch	0.631111
Sierpinski-arrowhead-curve	6.082500
Sierpinski-carpet	5.579189
Sierpinski-pentagon	6.688571
Sierpinski-square-curve	6.931111
Sierpinski-triangle	3.629348
Sierpinski-triangle-Graphical	4.102727
Sieve-of-Eratosthenes	5.532892
Sieve-of-Pritchard	7.382857
Simple-database	15.134615
Simple-turtle-graphics	7.528000
Simple-windowed-application	2.893333
Simulate-input-Keyboard	4.231429
Simulate-input-Mouse	1.103636
Singleton	2.730488
Singly-linked-list-Element-definition	2.304242
Singly-linked-list-Element-insertion	1.831429
Singly-linked-list-Traversal	2.501304
Singular-value-decomposition	1.882222
Sisyphus-sequence	9.670000
Sleep	0.999697
Sleeping-Beauty-problem	3.215000
Smallest-number-k-such-that-k+2m̂-is-composite-for-all-m-less-than-k	2.995714
Smarandache-Wellin-primes	6.688889
Smarandache-prime-digital-sequence	7.753125
Smith-numbers	8.386818
Snake	19.191875
Sockets	1.416250
Sokoban	13.840667
Soloways-recurring-rainfall	3.877857
Solve-a-Hidato-puzzle	10.426471
Solve-a-Holy-Knights-tour	13.879231
Solve-a-Hopido-puzzle	11.040000
Solve-a-Numbrix-puzzle	9.160000

Task	Mean Complexity
Solve-the-no-connection-puzzle	6.616190
Sort-a-list-of-object-identifiers	4.501500
Sort-an-array-of-composite-structures	2.398108
Sort-an-integer-array	0.795385
Sort-an-outline-at-every-level	31.277143
Sort-disjoint-sublist	3.725484
Sort-numbers-lexicographically	2.285294
Sort-stability	1.893333
Sort-three-variables	2.962400
Sort-using-a-custom-comparator	3.065714
Sorting-Algorithms-Circle-Sort	5.310000
Sorting-algorithms-Bead-sort	4.544737
Sorting-algorithms-Bogosort	3.751429
Sorting-algorithms-Bubble-sort	3.719714
Sorting-algorithms-Cocktail-sort	5.110000
Sorting-algorithms-Cocktail-sort-with-shifting-bounds	6.052727
Sorting-algorithms-Comb-sort	4.440000
Sorting-algorithms-Counting-sort	3.328966
Sorting-algorithms-Gnome-sort	3.842188
Sorting-algorithms-Heapsort	5.782593
Sorting-algorithms-Insertion-sort	3.127317
Sorting-algorithms-Merge-sort	6.026486
Sorting-algorithms-Pancake-sort	4.791600
Sorting-algorithms-Patience-sort	10.202941
Sorting-algorithms-Permutation-sort	3.730952
Sorting-algorithms-Quicksort	3.451639
Sorting-algorithms-Radix-sort	7.251000
Sorting-algorithms-Selection-sort	3.687273
Sorting-algorithms-Shell-sort	3.997391
Sorting-algorithms-Sleep-sort	2.694857
Sorting-algorithms-Stooge-sort	3.033077
Sorting-algorithms-Strand-sort	5.725625
Soundex	4.235714
Sparkline-in-unicode	5.386500
Special-characters	0.301304
Special-variables	0.755714
Speech-synthesis	1.464706
Spelling-of-ordinal-numbers	13.477692

Task	Mean Complexity
Sphenic-numbers	8.427500
Spinning-rod-animation-Text	2.323810
Spiral-matrix	4.486875
Split-a-character-string-based-on-change-of-character	2.830667
Square-but-not-cube	3.318261
Square-form-factorization	6.147500
Square-free-integers	7.178750
Stable-marriage-problem	14.258333
Stack	2.834082
Stack-traces	2.392333
Stair-climbing-puzzle	1.706486
Start-from-a-main-routine	1.211667
State-name-puzzle	6.552000
Statistics-Basic	5.726316
Statistics-Normal-distribution	3.473529
Steffensens-method	9.177778
Stem-and-leaf-plot	4.734516
Stern-Brocot-sequence	6.135937
Stirling-numbers-of-the-first-kind	6.625833
Stirling-numbers-of-the-second-kind	5.780000
Straddling-checkerboard	7.053333
Strassens-algorithm	12.184286
Stream-merge	6.848824
String-append	0.694706
String-case	1.150513
String-comparison	1.468387
String-concatenation	0.555405
String-interpolation-included-	0.803158
String-length	0.493043
String-matching	1.942667
String-prepend	0.588750
Strip-a-set-of-characters-from-a-string	1.758718
Strip-block-comments	4.618333
Strip-comments-from-a-string	2.602759
Strip-control-codes-and-extended-characters-from-a-string	3.010741
Strip-whitespace-from-a-string-Top-and-tail	1.351935
Strong-and-weak-primes	7.139412

Task	Mean Complexity
Subleq	5.568947
Substitution-cipher	5.131667
Substring	2.029375
Substring-Top-and-tail	1.637500
Subtractive-generator	4.392857
Successive-prime-differences	7.919412
Sudan-function	2.838000
Sudoku	11.274500
Suffixation-of-decimal-numbers	8.570000
Sum-and-product-of-an-array	0.876304
Sum-and-product-puzzle	10.619444
Sum-digits-of-an-integer	3.256176
Sum-multiples-of-3-and-5	3.241064
Sum-of-a-series	1.780976
Sum-of-elements-below-main-diagonal-of-matrix	3.527500
Sum-of-squares	1.310270
Sum-to-100	9.806061
Summarize-and-say-sequence	8.362222
Summarize-primes	4.901429
Super-d-numbers	4.872000
Superellipse	4.083846
Superpermutation-minimisation	6.327333
Sutherland-Hodgman-polygon-clipping	8.622500
Sylvesters-sequence	2.440000
Symmetric-difference	2.160000
Synchronous-concurrency	4.144857
System-time	0.422432
Table-creation-Postal-addresses	2.799375
Take-notes-on-the-command-line	3.917200
Tarjan	9.826667
Tau-function	4.858500
Tau-number	5.805556
Taxicab-numbers	6.767143
Teacup-rim-text	11.052857
Temperature-conversion	2.847143
Terminal-control-Clear-the-screen	0.847838
Terminal-control-Coloured-text	1.691538
Terminal-control-Cursor-movement	2.271538

Task	Mean Complexity
Terminal-control-Cursor-positioning	0.987895
Terminal-control-Dimensions	1.401875
Terminal-control-Display-an-extended-character	0.532222
Terminal-control-Hiding-the-cursor	0.977059
Terminal-control-Inverse-video	0.895385
Terminal-control-Positional-read	1.260000
Terminal-control-Preserve-screen	1.571538
Terminal-control-Ringing-the-terminal-bell	0.420455
Terminal-control-Unicode-output	2.010000
Ternary-logic	5.630000
Test-a-function	2.458125
Test-integerness	5.274375
Text-processing-1	7.386522
Text-processing-2	5.875000
Text-processing-Max-licenses-in-use	4.330741
Textonyms	9.308824
The-Name-Game	2.841739
The-Twelve-Days-of-Christmas	3.019286
The-sieve-of-Sundaram	6.842857
Thieles-interpolation-formula	5.368000
Thue-Morse	2.832667
Tic-tac-toe	20.764483
Time-a-function	2.076053
Tokenize-a-string	1.291136
Tokenize-a-string-with-escaping	6.335333
Tonelli-Shanks-algorithm	8.159375
Top-rank-per-group	4.674286
Topic-variable	1.361538
Topological-sort	5.950000
Topswops	5.977143
Total-circles-area	6.237000
Totient-function	5.400500
Towers-of-Hanoi	3.530244
Trabb-Pardo-Knuth-algorithm	3.379630
Transliterate-English-text-using-the-Greek-alphabet	2.396667
Tree-datastructures	9.061429

Task	Mean Complexity
Tree-from-nesting-levels	8.716154
Tree-traversal	11.133421
Trigonometric-functions	1.374839
Tropical-algebra-overloading	5.521250
Truncatable-primes	6.779583
Truncate-a-file	2.666800
Truth-table	13.708125
Twelve-statements	5.950000
Twin-primes	5.435500
Two-bullet-roulette	12.255455
Twos-complement	1.667000
UPC	15.182727
URL-decoding	1.378065
URL-encoding	1.016429
URL-parser	3.130000
UTF-8-encode-and-decode	4.459615
Ukkonen-s-suffix-tree-construction	22.137500
Ulam-spiral-for-primes-	5.660000
Ultra-useful-primes	3.263333
Unbias-a-random-generator	4.969000
Undefined-values	1.579667
Unicode-strings	0.748235
Unicode-variable-names	0.675600
Universal-Turing-machine	10.313571
Unix-ls	1.891786
Unprimeable-numbers	6.934583
Untouchable-numbers	4.533889
Update-a-configuration-file	12.097857
Use-another-language-to-call-a-function	2.539412
User-input-Graphical	2.100000
User-input-Text	1.082927
Validate-International-Securities-Identification-Number	5.756316
Vampire-number	7.048947
Van-Eck-sequence	4.787667
Van-der-Corput-sequence	3.247200
Variable-declaration-reset	2.328125
Variable-length-quantity	4.218421
Variable-size-Get	0.598519
Variable-size-Set	0.891333
Variables	0.692794
Variadic-function	1.346071

Task	Mean Complexity
Vector	5.122000
Vector-products	5.107692
Verhoeff-algorithm	5.925556
Verify-distribution-uniformity-Chi-squared-test	4.867083
Verify-distribution-uniformity-Naive	4.275500
Video-display-modes	1.657273
Vigen-re-cipher	4.614000
Vigen-re-cipher-Cryptanalysis	11.741667
Visualize-a-tree	9.440333
Vogels-approximation-method	8.245625
Voronoi-diagram	6.799000
Wagstaff-primes	2.926667
Walk-a-directory-Non-recursively	1.696000
Walk-a-directory-Recursively	3.416842
War-card-game	11.076667
Wasteful-equidigital-and-frugal-numbers	8.831429
Water-collected-between-towers	5.362069
Web-scraping	2.690294
Weird-numbers	12.674444
Wieferich-primes	6.009286
Wilson-primes-of-order-n	4.584545
Window-creation	1.793962
Window-creation-X11	4.586923
Window-management	7.083333
Wireworld	10.875882
Word-frequency	3.277188
Word-ladder	7.969333
Word-search	20.897273
Word-wheel	7.582105
Word-wrap	3.745405
Wordiff	12.820000
World-Cup-group-stage	6.295000
Write-entire-file	1.165556
Write-float-arrays-to-a-text-file	2.311923
Write-language-name-in-3D-ASCII	3.184444
Write-to-Windows-event-log	1.822941
XML-DOM-serialization	1.581724
XML-Input	3.118333
XML-Output	2.708108

Task	Mean Complexity
XML-XPath	3.696250
Xiaolin-Wus-line-algorithm	6.215000
Y-combinator	3.513253
Yahoo-search-interface	10.509000
Yellowstone-sequence	10.153333
Yin-and-yang	4.208800
Zebra-puzzle	13.890333
Zeckendorf-arithmetic	13.795333
Zeckendorf-number-representation	4.575000
Zero-to-the-zero-power	0.865909
Zhang-Suen-thinning-algorithm	8.843333
Zig-zag-matrix	4.666154
Zumkeller-numbers	12.009286