

# Free Programming Language Textbooks and Tutorials

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I maintain this document as text in the Pandoc’s dialect of Markdown using embedded LaTeX markup for the mathematical formulas and then translate the notes to HTML, PDF, and other formats as needed.

**Advisory:** The HTML version of this document requires use of a browser that supports the display of MathML. A good choice as of February 2018 is a recent version of Firefox from Mozilla.

1. GitHub Free Programming Books list
2. BETA—a pure object-oriented language from the “Scandinavian School” of object-oriented languages. This School originated with Simula, the first object-oriented language.
  - a. Ole Lehrmann Madsen, Birger Moller-Pedersen, and Kristen Nygaard. Object-Oriented Programming in the Beta Programming Language, ACM, 1993:  
[PDF book]
3. Elixir
4. Erlang—a concurrency-oriented functional programming language developed in the 1980s at the Ericsson Computer Science Laboratory but which is now available in an open-source implementation.
  - a. Joe Armstrong, Robert Virding, Claes Wikstrom, and Mike Williams. Concurrent Programming in ERLANG, Second Edition, Prentice-Hall,

- 1996:  
[Section 1 PDF]
- b. Fred Hebert. Learn You Some Erlang for Great Good, No Starch Press, 2011:  
[HTML book]
5. Forth
- a. Leo Brodie, Thinking Forth, ANS Forth Edition, 2004:  
[PDF book page]
6. Haskell
- a. William R. Cook. Anatomy of Programming Languages (new textbook on programming language theory under development):  
[HTML book]
- b. H. Conrad Cunningham. Notes on Functional Programming with Haskell (old version)  
  
[new expanded version, partial draft]
- c. Kees Doets and Jan van Eijck. The Haskell Road to Logic, Math and Programming, March 2004:  
[PDF book]
- d. Paul Hudak. The Haskell School of Music: From Signals to Symphonies, Version 2.5, January 2013:  
[PDF draft book]  
  
Source code from Paul Hudak's *The Haskell School of Expression: Learning Functional Programming through Multimedia*, Cambridge University Press, 2000:  
[local files]
- e. Miran Lipovaca. Learn You a Haskell for Great Good:  
[HTML book]
- f. Simon Marlow. Parallel and Concurrent Programming in Haskell:  
[HTML book]
- g. Bryan O'Sullivan, Don Stewart, and John Goerzen. Real World Haskell:  
[HTML book]
- h. Jonathan Tang. Write Yourself a Scheme in 48 Hours: A Haskell Tutorial (writing a Scheme interpreter in Haskell):  
[HTML book]
- i. Source code from Simon Thompson's *Haskell: The Craft of Functional Programming*, Third Edition, Addison Wesley, 2011: [local files]
7. Icon and Unicon

- a. Ralph E. Griswold and Madge T. Griswold. The Icon Programming Language Third Edition, Peer-to-Peer Communications, 1996, and other Icon books at Arizona:  
[book links]
  - b. Clinton Jeffery, Shamim Mohamed, Jafar Al Gharaibeh, Ray Pareda, and Robert Parlett. Programming with Unicon, Second Edition, 2013:  
[PDF book]
- 8. Javascript
  - a. Marijn Haverbeke. Eloquent JavaScript: A Modern Introduction to Programming, First Edition, No Starch Press, February 2011:  
[HTML book] [2nd ed preview]
  - b. Addy Osmani. Learning JavaScript Design Patterns, O'Reilly Media, Inc., 2014:  
[HTML]
  - c. Axel Rauschmayer. Speaking JavaScript, O'Reilly Media, Inc., 2014:  
[HTML]
  - d. Kyle Simpson. You Don't Know JS series:  
[series page]
- 9. Linda
  - a. Nicholas Carriero and David Gelernter. How to Write Parallel Programs: A First Course, 1992:  
[HTML/PDF book]
- 10. Lisp
  - a. Paul Graham. On Lisp: Advanced Techniques for Common Lisp, Prentice Hall, 1993:  
[free book page]
  - b. Daniel Holden. Build Your Own Lisp (in C), CreateSpace Independent Publishing Platform, October 2014:  
[HTML]
  - c. Doug Hoyle. Let Over Lambda-50 Years of Lisp, Second Edition, 2013:  
[HTML book]
- 11. Lua
  - a. Fabio Mascarenhas. Programming in Lua Lecture Notes, for a course based on Roberto Ierusalimschy's (PiL) Programming in Lua, Third Edition, 2013.
  - b. Lua Tutorial
- 12. ML

- a. Robert Harper. Programming in Standard ML, Carnegie Mellon University, 2011:  
[PDF draft]
  - b. John Harrison. Introduction to Functional Programming, 1996:  
[PS book/slides]
13. OCaml
- a. Yaron Minsky, Anil Madhavapeddy, and Jason Hickey. Real World OCaml, O'Reilly Media, 2013:  
[PDF book]
14. Prolog
- a. Patrick Blackburn, Johan Bos, and Kristina Striefnitz. Learn Prolog Now, 2006-12:  
[book site]
15. PureScript
- a. Phil Freeman. [Purescript by Example](<https://leanpub.com/purescript>), Leanpub, 2017.
16. Python
- a. Allen B. Downey. Think Python: How to Think Like a Computer Scientist, Green Tea Press, 2013:  
[PDF/HTML book page]
17. Ruby
- a. Chris Pine. Learn to Program, 2009:  
[HTML book]
  - b. why the lucky stiff (Jonathan Gillette). why's (poignant) guide to Ruby:  
[Tutorial]
18. Scala
- a. Michel Schniz and Philipp Haller. A Scala Tutorial for Java Programmers:  
Original from <<http://www.scala-lang.org>> (Documentation, Manuals, A Brief Scala Tutorial).  
[Cunningham's revision]
  - b. Martin Odersky. *Scala by Example*: [local]  
Original at <<http://www.scala-lang.org>> (Documentation, Manuals, Scala By Example).
  - c. Martin Odersky, Lex Spoon, and Bill Venners. *Programming in Scala*, First Edition, Artima, 2008:  
[HTML book]

19. Scheme

- a. (SICP) Harold Abelson and Gerald J. Sussman with Julie Sussman. Structure and Interpretation of Computer Programs, Second Edition, MIT Press, 1996:  
[book site at MIT Press] [HTML book] [[SICP ebook site] (<http://sicpebook.wordpress.com/>)] [local source code]
- b. Stephen Bloch. Picturing Programs: An Introduction to Computer Programming (uses the Racket dialect of Scheme):  
[HTML/PDF book]
- c. Kent Dybvig. The Scheme Programming Language, Fourth Edition, MIT Press, 2009:  
[HTML book]
- d. Matthias Felleisen, Robert Bruce Findler, Matthew Flatt, and Shriram Krishnamurthi. How to Design Programs, Second Edition (uses the Racket dialect of Scheme):  
[HTML book]
- e. Brian Harvey and Mathew Wright. Simply Scheme: Introducing Computer Science, Second Edition, MIT Press, 1999:  
[book site]
- f. Kurt Normark. Functional Programming in Scheme With Web Programming Examples, Department of Computer Science, Aalborg University, Denmark

20. Simula—the first object-oriented programming language. It is a “Scandinavian School” object-oriented language designed for simulation programming.

- a. Rob Pooley. An Introduction to Programming in Simula, Oxford Blackwell Scientific Publications, 1987:  
[HTML book]

21. Smalltalk—a dynamically typed, reflective, object-oriented programming language originally designed at Xerox PARC in the 1970s.

- a. Andrew P. Black, Stephane Ducasse, Oscar Nierstrasz, Damien Pollet, Damien Cassou, and Marcus Denker. Squeak by Example:  
[PDF book]
- b. Andrew P. Black, Stephane Ducasse, Oscar Nierstrasz, and Damien Pollet, Damien Cassou, and Marcus Denker. Pharo by Example:  
[PDF book]
- c. Alexandre Bergel, Damien Cassou, Stephane Ducasse, and Jannik Laval. Deep into Pharo, 2013:  
[PDF draft]

22. Snobol4—the classic string-processing language and precursor to Icon
  - a. R. E. Griswold, J. F. Poage, and I. P. Polonsky. The Snobol4 Programming Language, Second Edition, Prentice-Hall, 1971:  
[PDF book]
23. Programming language design
  - a. Source code for interpreters in the the textbook: Samuel N. Kamin. Programming Languages: An Interpreter-Based Approach, Addison Wesley, 1990.
  - b. Shiram Krishnamurthi. Programming Languages: Application and Interpretation, Second Edition, [HTML] [PDF] [Fall 2012 course] [Fall 2013 course]
  - c. Simon Thompson. Type Theory and Functional Programming, Addison-Wesley, 1991:  
[book site]