



# Practical Programming: An Introduction to Computer Science Using Python (Pragmatic Programmers)

By Jennifer Campbell, Paul Gries, Jason Montojo, Greg Wilson

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Welcome to computer science in the 21st century. Did you ever wonder how computers represent DNA? How they can download a web page containing population data and analyze it to spot trends? Or how they can change the colors in a color photograph? If so, this book is for you. By the time you're done, you'll know how to do all of that and a lot more. And Python makes it easy and fun.

Computers are used in every part of science from ecology to particle physics. This introduction to computer science continually reinforces those ties by using real-world science problems as examples. Anyone who has taken a high school science class will be able to follow along as the book introduces the basics of programming, then goes on to show readers how to work with databases, download data from the web automatically, build graphical interfaces, and most importantly, how to think like a professional programmer.

Topics covered include:

*Basic elements of programming from arithmetic to loops and if statements.*

Using functions and modules to organize programs.

*Using lists, sets, and dictionaries to organize data.*

Designing algorithms systematically.

*Debugging things when they go wrong.*

Creating and querying databases.

*Building graphical interfaces to make programs easier to use.*

Object-oriented programming and programming patterns.

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- Sales Rank: #988470 in Books
- Brand: Pragmatic Bookshelf
- Published on: 2009-06-07
- Original language: English

- Number of items: 1
- Dimensions: 9.25" h x .70" w x 7.50" l, 1.35 pounds
- Binding: Paperback
- 350 pages



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### **Editorial Review**

#### **About the Author**

Jennifer Campbell is a senior lecturer in the Department of Computer Science at the University of Toronto. Over the past 10 years, Jen's primary focus has been on teaching and curriculum design of introductory courses. Jen is involved in several projects exploring student experiences in introductory computer science courses and the factors that contribute to success, including the effectiveness of the inverted classroom.

Paul Gries has been teaching in the Department of Computer Science at the University of Toronto for more than 15 years. During his time at UofT, Paul has won numerous teaching awards, including UofT's most prestigious teaching award and an Ontario-wide teaching award. Paul has also co-authored two textbooks, has been a leader in departmental curriculum design and renewal, and, with Jen, got to teach Python to tens of thousands of students in a MOOC.

Jason Montojo is a research officer at the Donnelly Centre for Cellular and Biomolecular Research at the University of Toronto, where he develops scientific software for the Cytoscape and GeneMANIA projects. He has a strong interest in teaching computer science and frequently mentors students for Google's Summer of Code program.

Greg Wilson holds a Ph.D. in Computer Science from the University of Edinburgh, and has worked on high-performance scientific computing, data visualization, and computer security. He is the author of Data Crunching and Practical Parallel Programming (MIT Press, 1995), and is a contributing editor at Doctor Dobb's Journal, and an adjunct professor in Computer Science at the University of Toronto.

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