

PREFACE TO THE SECOND EDITION

The response to the first edition of *Python Crash Course* has been overwhelmingly positive. More than 500,000 copies are in print, including translations in eight languages. I've received letters and emails from readers as young as 10, as well as from retirees who want to learn to program in their free time. *Python Crash Course* is being used in middle schools and high schools, and also in college classes. Students who are assigned more advanced textbooks are using *Python Crash Course* as a companion text for their classes and finding it a worthwhile supplement. People are using it to enhance their skills on the job and to start working on their own side projects. In short, people are using the book for the full range of purposes I had hoped they would.

The opportunity to write a second edition of *Python Crash Course* has been thoroughly enjoyable. Although Python is a mature language, it continues to evolve as every language does. My goal in revising the book was to make it leaner and simpler. There is no longer any reason to learn Python 2, so this edition focuses on Python 3 only. Many Python packages have become easier to install, so setup and installation instructions are easier. I've added a few topics that I've realized readers would benefit from, and I've updated some sections to reflect new, simpler ways of doing things in Python. I've also clarified some sections where certain details of the

language were not presented as accurately as they could have been. All the projects have been completely updated using popular, well-maintained libraries that you can confidently use to build your own projects.

The following is a summary of specific changes that have been made in the second edition:

- In Chapter 1, the instructions for installing Python have been simplified for users of all major operating systems. I now recommend the text editor Sublime Text, which is popular among beginner and professional programmers and works well on all operating systems.
- Chapter 2 includes a more accurate description of how variables are implemented in Python. Variables are described as *labels* for values, which leads to a better understanding of how variables behave in Python. The book now uses f-strings, introduced in Python 3.6. This is a much simpler way to use variable values in strings. The use of underscores to represent large numbers, such as `1_000_000`, was also introduced in Python 3.6 and is included in this edition. Multiple assignment of variables was previously introduced in one of the projects, and that description has been generalized and moved to Chapter 2 for the benefit of all readers. Finally, a clear convention for representing constant values in Python is included in this chapter.
- In Chapter 6, I introduce the `get()` method for retrieving values from a dictionary, which can return a default value if a key does not exist.
- The Alien Invasion project (Chapters 12–14) is now entirely class-based. The game itself is a class, rather than a series of functions. This greatly simplifies the overall structure of the game, vastly reducing the number of function calls and parameters required. Readers familiar with the first edition will appreciate the simplicity this new class-based approach provides. Pygame can now be installed in one line on all systems, and readers are given the option of running the game in fullscreen mode or in a windowed mode.
- In the data visualization projects, the installation instructions for Matplotlib are simpler for all operating systems. The visualizations featuring Matplotlib use the `subplots()` function, which will be easier to build upon as you learn to create more complex visualizations. The Rolling Dice project in Chapter 15 uses Plotly, a well-maintained visualization library that features a clean syntax and beautiful, fully customizable output.
- In Chapter 16, the weather project is based on data from NOAA, which should be more stable over the next few years than the site used in the first edition. The mapping project focuses on global earthquake activity; by the end of this project you'll have a stunning visualization showing Earth's tectonic plate boundaries through a focus on the locations of all earthquakes over a given time period. You'll learn to plot any data set involving geographic points.
- Chapter 17 uses Plotly to visualize Python-related activity in open source projects on GitHub.

- The Learning Log project (Chapters 18–20) is built using the latest version of Django and styled using the latest version of Bootstrap. The process of deploying the project to Heroku has been simplified using the `django-heroku` package, and uses environment variables rather than modifying the `settings.py` files. This is a simpler approach and is more consistent with how professional programmers deploy modern Django projects.
- Appendix A has been fully updated to recommend current best practices in installing Python. Appendix B includes detailed instructions for setting up Sublime Text and brief descriptions of most of the major text editors and IDEs in current use. Appendix C directs readers to newer, more popular online resources for getting help, and Appendix D continues to offer a mini crash course in using Git for version control.
- The index has been thoroughly updated to allow you to use *Python Crash Course* as a reference for all of your future Python projects.

Thank you for reading *Python Crash Course*! If you have any feedback or questions, please feel free to get in touch.