

KARIM PICHARA – CHRISTIAN PIERINGER

ADVANCED COMPUTER PROGRAMMING IN PYTHON

ADVANCED COMPUTER PROGRAMMING IN PYTHON

Copyright © 2017 by Karim Pichara and Christian Pieringer

All rights reserved. This book or any portion thereof may not be reproduced or used in any manner whatsoever without the express written permission of the publisher except for the use of brief quotations in a book review.

ISBN: 9781521232385

To our wives and children

Preface

This book contains most of the relevant topics necessary to be an advanced computer programmer. The language used in the book is Python 3. Besides the programming language, the reader will learn most of the backbone contents in computer programming, such as object-oriented modeling, data structures, functional programming, input/output, simulation, graphical interfaces, and much more. We believe that the best way to learn computer programming is to work in hands-on activities. Practical exercises make the user get familiar with the main challenges that programming brings, such as how to model a particular problem; or how to write good code and efficient routine implementation, among others. Most of the chapters contain a set of hands-on activities (with proposed solutions) at the end. We encourage the readers to solve all those assignments without previously checking the solution. Challenges may be hard for initial programmers, but while going through this book, the activities will become more achievable for the reader. This book contains most of the material used for the *Advanced Python Programming* course taught at PUC University in Chile, by professors Karim Pichara and Christian Pieringer. The course is intended for Computer Science students as well as any other affine career that can be benefited by computer programming knowledge. Of course, this book is not enough to become a Software Engineer; there are other necessary courses that the reader must take to learn more advanced concepts related to the development of bigger software projects. Some of the recommended courses are *Database Systems*, *Data Structures*, *Operating Systems*, *Compilers*, *Software Engineering*, *Testing*, *Software Architecture*, and *Software Design*, among others. The content of this book will prepare the reader to have the necessary background for any of the next Software Engineering courses listed above. While using this book, readers should follow along on their computers to be able to try all the examples included in the chapters. It will be necessary that computers have already installed the required Python libraries.

Authors



Karim Pichara Baksai

Ph.D. in Computer Science,

Research Area: Machine Learning and Data Science applied to Astronomy

Associate Professor, Computer Science Department

Pontificia Universidad Católica de Chile (PUC)



Christian Pieringer Baeza

Ph.D. in Computer Science

Research Area: Computer Vision and Machine Learning

Adjunt Professor, Computer Science Department

Pontificia Universidad Católica de Chile (PUC)

Acknowledgments

This book was not possible without the constant help of the teaching assistants; they gave us invaluable feedback, code and text editions to improve the book. The main collaborators who highly contributed are Belén Saldías, Ivania Donoso, Marco Bucchi, Patricio López, and Ignacio Becker.

We would like also thank the team of assistants who worked in the hands-on activities: Jaime Castro, Rodrigo Gómez, Bastián Mavrakis, Vicente Dominguez, Felipe Garrido, Javiera Astudillo, Antonio Gil, and José María De La Torre.



Belén Saldías



Ivania Donoso



Marco Bucci



Patricio López



Ignacio Becker