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# ADVANCED COMPUTER PROGRAMMING IN PYTHON

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*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.

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