TAMING PYTHON *by* PROGRAMMING

Dr. Jeeva Jose

KHANNA BOOK PUBLISHING CO. (P) LTD.

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Website	**:** www.khannabooks.com, www.khannapublishers.com	

Price : ₹ 325.00

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ISBN: 978-93-86173-34-8

Edition: 2017

Published by:

KHANNA BOOK PUBLISHING CO. (P) LTD.
4C/4344, Ansari Road, Darya Ganj, New Delhi-110 002
Phone: 011-23244447-48 **Mobile:** +91-9910909320
E-mail: contact@khannabooks.com

Printed in India by:
India Book Printers & Binders, Delhi

Preface

Python is a general-purpose, high-level programming language. It is an Open Source Software and its source code is available with a license in which the Copyright holder provides the rights to study, change, and distribute the software to anyone and for any purpose. This programming language was developed in late 1980s and its implementation was started in December 1989 by Guido van Rossum at Centrum Wiskunde & Informatica which is a research center in Netherlands. The non-profit organization Python Software Foundation fosters the development of Python community and is responsible for various processes within the Python community which includes developing Python projects, distribution, managing intellectual rights, developer conferences including PyCon, and raising funds.

Python is easy to learn for a first time programmer or a person experienced in other programming languages. It can be read like English language. Python can run on any hardware platform (PC, Mac, Sun Sparc, etc.) or software platform (Linux, MacOS, Unix, Windows, etc.). Its design philosophy emphasizes code readability and its syntax allow programmers to express concepts in least lines of code than in languages like C++ or Java. Python supports multiple programming paradigms, including object-oriented, imperative and functional programming or procedural styles. It features a dynamic type system, automatic memory management and has a large comprehensive standard library. It is powerful, fast and has the ability to play with other programs.

Python is an interpreted, interactive, object-oriented programming language. It incorporates modules, exceptions, dynamic typing, very high level dynamic data types, and classes. Python is a scripting language like PHP, Perl, Ruby and can be used for Web programming (Django, Zope, Google App Engine and much more). It also can be used for desktop applications (Blender 3D, pygame). Python can also be translated into byte code like Java.

Python is great for data analysis, artificial intelligence and scientific computing. Developers can use Python to build prototypes, productivity tools and games. The softwares like YouTube, DropBox, Instagram, etc. are to name a few which is written in Python. Python is used in many application domains. Python's standard library supports many Internet Protocols such as HTML, XML, JSON, E-mail processing, FTP, IMAP etc. Government is utilizing this for Administration, Homeland Security, Public Safety, Traffic Control, Urban Infrastructure etc. In Business, Python is using in domains such as Consumer Goods Industry, Aviation, Medical, Industrial, Financial services, GIS &

Mapping, Marine and Lighting. Python is used in areas of Customer Relationship Management (CRM), Content & Document Management, Energy Conservation, E-Commerce, Enterprise Resource Planning (ERP), Knowledge Management, Manufacturing, Product Development, Project Management, Quality Control, Online Analytical Processing, Risk Management, Simulation etc. In Network Programming, Python is used to control Firmware updates. In Software, Python plays a role in Computer Graphics, Cross-platform Development, Data Mining, Documentation Development, Embedded Systems etc.

Based on the application, many packages and libraries are developed in Python. SciPy is a collection of packages for Mathematics, Science, and Engineering. Pandas is a data analysis and modeling library. IPython is a powerful interactive shell that features easy editing and recording of a work session, and supports visualizations and parallel computing.

This book takes you from basics of Python to advanced areas smoothly. This book is suitable for Python enthusiasts, students and researchers.

Chapter 1 of this book introduce you to Python, its features, programming constructs like identifiers, reserved keywords, variables and various operators. All the data types in Python which includes numbers, strings, list, tuple, set and dictionary are covered in Chapter 2. Chapter 3 explains various types of decision making and loops. While moving to Chapter 4, the book covers a detailed explanation of functions. Chapter 5 explains about modules and packages. Concepts and operations of file handling are explained in Chapter 6. Object Oriented Programming concepts are explained in Chapter 7. Chapter 8 covers Exception Handling techniques. Regular Expressions are covered in Chapter 9. Chapter 10 explains how databases can be connected from Python. All operations including creation of tables, insert, delete, update and SQL statements are explained in detail.

Advanced topics like the concept of iterators, generators and decorators in Python are provided in Chapter 11. These topics will be new to many other programmers using C or C++. Chapter 12 explains about GUI programming using tkinter and various widgets used in Python. Chapter 13 explains the concept of multithreading. Different types of threads in Python, the thread module and threading module is explained. Chapter 14 covers a detailed description of CGI programming. Various HTTP headers and environment variables are explained in detail. Chapter 15 covers the concept of socket or network programming. The socket module, various methods associated with client sockets and server sockets are illustrated. How to connect to a server, making a server and making a client are illustrated with example programs.

All Chapters of this book have worked out programs, illustrations, review and frequently asked interview questions. More than 450 solved lab exercises available in this book is tested in Python 3.4.3 version for Windows.

–Author

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