



# Python

# Fundamentals

## A Comprehensive Introduction



**Dr. Shaloo Dadheech**  
**Ms. Shweta Solanki**  
**Dr. Prabhat Mathur**

# Python Fundamentals: A Comprehensive Introduction



**India | UAE | Nigeria | Uzbekistan | Montenegro | Iraq |  
Egypt | Thailand | Uganda | Philippines | Indonesia**  
**[www.empyrealpublishinghouse.com](http://www.empyrealpublishinghouse.com)**

# Python Fundamentals: A Comprehensive Introduction

*Authored By:*

**Dr. Shaloo Dadheech**

Associate Professor of Computer Science at JIET College

**Ms. Shweta Solanki**

Assistant Professor of Computer Science at JIET College, Jodhpur

**Dr. Prabhat Mathur**

Associate Professor, Faculty of Computer Science, Lachoo Memorial  
College of Science and Technology, Jodhpur

Copyright 2024 by Dr. Shaloo Dadheech, Ms. Shweta Solanki and  
Dr. Prabhat Mathur

First Impression: June 2024

**Python Fundamentals: A Comprehensive Introduction**

**ISBN: 978-81-972426-3-2**

**Rs. 1000/- (\$80)**

No part of the book may be printed, copied, stored, retrieved, duplicated and reproduced in any form without the written permission of the editor/publisher.

**DISCLAIMER**

Information contained in this book has been published by Empyreal Publishing House and has been obtained by the authors from sources believed to be reliable and correct to the best of their knowledge. The authors are solely responsible for the contents of the articles compiled in this book. Responsibility of authenticity of the work or the concepts/views presented by the author through this book shall lie with the author and the publisher has no role or claim or any responsibility in this regard. Errors, if any, are purely unintentional and readers are requested to communicate such error to the author to avoid discrepancies in future.

Published by:  
Empyreal Publishing House

## Acknowledgement

We would like to extend our deepest gratitude to everyone who has supported us throughout the process of writing this book.

First and foremost, we thank our families for their unwavering encouragement and patience. Their understanding during our long hours of work and their constant support made this book possible.

We also want to acknowledge the contributions of the countless educators and developers whose resources, tutorials, and discussions have inspired and informed our work. The open-source community, in particular, has been a tremendous source of knowledge and inspiration.

To our students and readers, your curiosity and enthusiasm for learning Python have driven us to create a comprehensive and accessible guide. Your questions and challenges have pushed us to delve deeper and explain concepts more clearly.

Lastly, we express our heartfelt thanks to our publisher and editorial team for their professionalism, guidance, and unwavering support throughout the publication process. Your expertise has been instrumental in bringing this book to life.

Thank you all for your contributions and encouragement. This book is as much a product of your support as it is of our efforts.

Sincerely,

**Dr. ShalooDadheech**

**Ms. Shweta Solanki**

**Dr. Prabhat Mathur**

## About the Authors



**Dr. Shaloo Dadheech** is a leading computer science Academician. She received her Ph.D. in Computer Science and currently serves as an Associate professor of computer science at JIET College.

In addition to her research, Dr. Dadheech is a sought-after speaker and educator, giving talks and lectures on topics related to artificial intelligence, machine learning, and human-computer interaction at conferences and universities.

Dr. Dadheech is passionate about using her knowledge and expertise to make a positive impact on society.

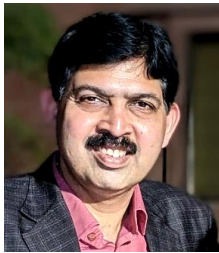
In her free time, she volunteers with organizations that promote technology education and literacy in underserved communities. She has been awarded by various academic and non-academic award in past years. Recently she has published one book which is live on kindle. Now her next project is writing a basic computer book and distribute it among needy children.



**Ms. Shweta Solanki** is a leading computer science Academician. She received her M.Tech. in Computer Science from MDSU, Ajmer and pursuing PhD. Currently serves as an Assistant professor of computer science at JIET college, Jodhpur. Visiting faculty at MBM Engineering University Jodhpur, Jai Narain Vyas University, Jodhpur.

In addition, speaker and educator, writing in many topics related to Framework Using AI, networking, Ms. Shweta Solanki is a skilled wordsmith with a passion for Education. Specializing on topics related to

research, computer programming. She weaves[s] tales that leave a lasting impact on readers. She brings characters to life and transport[s] readers to captivating worlds. Connect with programming, AI for updates and insights technology.



**Dr. Prabhat Mathur** is an Associate Professor at Lachoo Memorial College & Technology (Autonomous), Jodhpur, Rajasthan. He possesses a Ph.D. and a degree in MCA, and PGDCTA from Jai Narain Vyas University, Jodhpur, and is renowned for his expertise in Computer Science. Dr. Mathur has significantly contributed to academic research and teaching. With a strong educational background and a commitment to fostering intellectual growth, he plays a vital role in shaping his students' minds and advancing the college's mission. His research interests and publications have earned him recognition in the academic community, further establishing him as a respected educator and scholar. Dr. Mathur has 22 years of experience, during which he has mentored numerous students, guiding them toward academic excellence and professional success. His innovative teaching methods and dedication to student development have made him a beloved figure among his pupils. In addition to his teaching responsibilities, Dr. Mathur actively participates in academic conferences and seminars, where he shares his insights and collaborates with fellow scholars. He has published texts extensively in reputable journals, contributing to advancing knowledge in his field.

## Table of Contents

<b>Acknowledgement</b>		<b>IV</b>
<b>About the Authors</b>		<b>V - VI</b>
<b>Table of Contents</b>		<b>VII - X</b>
<b>Sr.No.</b>	<b>Title of Chapters</b>	<b>Page No.</b>
1	<b><i>INTRODUCTION TO PYTHON</i></b>	1 – 21
	1.1 <i>History of Python</i>	
	1.2 <i>Getting Started</i>	
	1.3 <i>Advantages and Disadvantages</i>	
	1.4 <i>Python V/S C</i>	
	1.5 <i>Python V/S C++</i>	
	1.6 <i>Python V/S Go Lang</i>	
	1.7 <i>Python Basics and Syntax</i>	
	1.8 <i>Python Variables</i>	
	1.9 <i>Python Data Types</i>	
	1.10 <i>Python Operators</i>	
2	<b><i>CONTROL FLOW IN PYTHON</i></b>	22 – 34
	2.1 <i>Conditional Statements</i>	
	2.2 <i>Loops</i>	
	2.3 <i>Control Statements</i>	
3	<b><i>PYTHON STRINGS</i></b>	35 – 69
	3.1 <i>Introduction to Strings</i>	



3.2	<i>Creating and Manipulating Strings</i>	
3.3	<i>String Methods</i>	
4	<b>FUNCTIONS IN PYTHON</b>	70 – 86
4.1	<i>Defining Functions</i>	
4.2	<i>Parameters and Arguments</i>	
4.3	<i>Scope of Variables in Functions</i>	
4.4	<i>Advance Functions</i>	
5	<b>DATA STRUCTURES</b>	87 – 97
5.1	<i>Lists</i>	
5.2	<i>Tuples</i>	
5.3	<i>Dictionaries</i>	
5.4	<i>Sets</i>	
5.5	<i>Comparison between Lists, Tuples, Dictionaries, and Sets</i>	
6	<b>FILE HANDLING</b>	98 – 101
6.1	<i>Opening and Closing Files</i>	
6.2	<i>Reading and Writing Files</i>	
6.3	<i>Working with JSON</i>	
7	<b>INTRODUCTION TO PATTERN MATCHING WITH REGULAR EXPRESSIONS IN PYTHON</b>	102 – 113
7.1	<i>Finding Patterns of Text without Regular Expressions</i>	
7.2	<i>More Pattern Matching with Regular</i>	

	<i>Expressions</i>	
	7.3 <i>Greedy and Non-Greedy Matching</i>	
	7.4 <i>The findall() Method</i>	
	7.5 <i>Character Classes and Making Your Own Character Classes</i>	
	7.6 <i>Custom Character Classes</i>	
	7.7 <i>The Caret ^ and Dollar Sign \$ Characters</i>	
	7.8 <i>The Wildcard Character</i>	
	7.9 <i>Case-Insensitive Matching</i>	
	7.10 <i>Substituting Strings with the sub() Method</i>	
8	<b>MODULES AND PACKAGES</b>	114 – 120
	8.1 <i>Creating Modules</i>	
	8.2 <i>Importing Modules</i>	
	8.3 <i>Understanding Packages</i>	
9	<b>EXCEPTION HANDLING</b>	121 – 127
	9.1 <i>Exception Handling</i>	
	9.2 <i>Try...Except block</i>	
	9.3 <i>Finally Block</i>	
10	<b>OBJECT ORIENTED PROGRAMMING (OOPS) IN PYTHON</b>	128 – 142
	10.1 <i>Classes and Objects</i>	
	10.2 <i>Inheritance</i>	
	10.3 <i>Polymorphism</i>	
	10.4 <i>Encapsulation</i>	

11	<b><i>PYTHON DECORATORS AND THEIR TYPES</i></b>	131 – 150
	11.1 <i>Decorators</i>	
	11.2 <i>Generators</i>	
	11.3 <i>Multithreading and Multiprocessing</i>	
	11.4 <i>Virtual Environments</i>	
12	<b><i>SOLVED MCQ'S</i></b>	151 – 171
13	<b><i>PROGRAMMING EXERCISES</i></b>	172– 176

## ABOUT THE AUTHORS



**Dr. Shaloo Dadheech**

Associate Professor of Computer Science at JIET College



**Ms. Shweta Solanki**

Assistant Professor of Computer Science at JIET College, Jodhpur



**Dr. Prabhat Mathur**

Associate Professor, Faculty of Computer Science, Lachoo Memorial College of Science and Technology, Jodhpur



India | UAE | Nigeria | Uzbekistan | Montenegro | Iraq | Egypt | Thailand | Uganda | Philippines | Indonesia

Empyreal Publishing House || [www.empyrealpublishinghouse.com](http://www.empyrealpublishinghouse.com) || [info@empyrealpublishinghouse.com](mailto:info@empyrealpublishinghouse.com)