

Title: Python Programming for Beginners: From Zero to Confident Developer

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Part I: Python Fundamentals

Chapter 1: Introduction to Python & Setting Up

- Installing Python and IDEs
- Hello World Example
- Understanding Python's capabilities

Chapter 2: Python Syntax & Variables

- Variables and Data Types
- Naming Conventions
- Examples with numbers, strings, booleans

Chapter 3: Operators & Expressions

- Arithmetic, Comparison, Logical Operators
- Examples with practical calculations

Chapter 4: Control Flow: If, Else, Elif

- Decision-making statements
- Examples: Grading system, conditional messages

Chapter 5: Loops: For & While

- Iteration over ranges and collections
- Break and Continue
- Examples: Counting, summing numbers

Chapter 6: Functions in Python

- Defining and calling functions
- Parameters and return values
- Practical examples: Calculator functions, greetings

Chapter 7: Data Structures: Lists & Tuples

- Lists: creation, indexing, slicing, methods
- Tuples: immutability, usage scenarios

Chapter 8: Dictionaries & Sets

- Dictionaries: key-value pairs, access, methods
- Sets: uniqueness, operations, practical usage

Chapter 9: Strings & String Manipulation

- String methods, formatting, f-strings
- Examples: formatting messages, extracting data

Chapter 10: Modules & Packages

- Importing modules
- Using standard libraries (math, random)
- Creating your own modules

Part II: Intermediate Python

Chapter 11: File Handling

- Reading/writing text and CSV files
- Practical exercises

Chapter 12: Error Handling & Exceptions

- Try-Except blocks
- Raising exceptions
- Example: division by zero handling

Chapter 13: Object-Oriented Programming

- Classes, objects, methods
- Inheritance and encapsulation
- Practical examples: Student, BankAccount classes

Chapter 14: Python Libraries Overview

- Popular libraries: NumPy, Pandas, Matplotlib, Seaborn, Flask, scikit-learn
- Installation and usage

Chapter 15: Practical Python Projects

- Mini projects: Calculator, To-Do list, Automation scripts
- Exercises with solutions

Part III: Data Handling & Visualization

Chapter 16: NumPy Basics

- Arrays, array operations, mathematical functions
- Examples: vector calculations

Chapter 17: Pandas Basics

- DataFrames, Series, CSV handling, filtering
- Exercises: loading data, analyzing simple datasets

Chapter 18: Data Cleaning & Manipulation

- Handling missing data, transforming datasets
- Examples: sales data cleaning

Chapter 19: Matplotlib Basics

- Line, bar, pie, scatter plots
- Annotated examples

Chapter 20: Seaborn Basics

- Advanced visualization: histogram, boxplot, heatmap, scatterplot
- Practical applications

Part IV: Machine Learning & Web Development

Chapter 21: Introduction to Machine Learning

- Supervised vs Unsupervised Learning
- Real-world applications

Chapter 22: Your First Predictive Model

- KNN model on Iris dataset
- Train-test split, predictions, accuracy evaluation
- Exercises and solutions

Chapter 23: Introduction to Flask

- Installing Flask, creating routes
- Templates and dynamic content
- Forms handling

Chapter 24: Building Interactive Web Apps

- To-Do app example
- Displaying dynamic content
- Exercises for practice

Chapter 25: Mini Project: Complete Python Application

- Student Management System
- Flask, Pandas, Matplotlib integration
- Add, display, visualize student data
- Exercises: sorting, filtering, enhancing chart

Part V: Career Guidance & Next Steps

Chapter 26: Next Steps & Career Guidance

- Python Developer Mindset
- Solidify foundations and build real-world projects
- Git & GitHub usage

- Resume and portfolio tips
 - Practice daily coding and solve problems
 - Learn advanced skills: ML, web frameworks, automation
 - Networking and community involvement
 - Suggested 90-day roadmap
 - Freelancing and real-world experience
 - Lifelong learning advice
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End of Manuscript

Note: Each chapter includes: learning goals, step-by-step explanations, multiple annotated code examples, practice exercises with solutions, and chapter summaries. This structure makes the book beginner-friendly and ready for PDF compilation.