Python

Core

Ratan Sharma
MCA | NIT, Trichy

Python Roadmap

1. Introduction and Basics of Python
2. Operators
3. Conditional Statements
4. While Loops
5. Lists
6. Strings
7. For Loop
8. Functions
9. Dictionary
10. Tuples
11. Set
12. Object-Oriented Programming
13. File Handling
14. Exception Handling
15. Regular Expression
16. Modules and Packages
17. Data Structures
18. Higher-Order Functions
19. Python Web Scrapping
20. Virtual Environment
21. Web Application Project
22. Git and GitHub
23. Deployment
24. Python Package Manager
25. Python with MongoDB Database
26. Building API
27. Statistics with NumPy
28. Data Analysis with Pandas
29. 29. Data Visualization with Matplotlib
30. What to do Now?

1 | Introduction and Basics

1. Installation
2. Python Org, Python 3
3. Variables
4. Print function
5. Input from user
6. Data Types
7. Type Conversion
8. First Program

2 | Operators

1. Arithmetic Operators
2. Relational Operators
3. Bitwise Operators
4. Logical Operators
5. Assignment Operators
6. Compound Operators
7. Membership Operators
8. Identity Operators

3 | Conditional Statements

1. If Else
2. If
3. Else
4. El If (else if)
5. If Else Ternary Expression

4 | While Loop

1. While loop logic building
2. Series based Questions

3. Break
4. Continue
5. Nested While Loops
6. Pattern-Based Questions
7. pass
8. Loop else

5 | Lists

1. List Basics
2. List Operations
3. List Comprehensions / Slicing
4. List Methods

6 | Strings

1. String Basics
2. String Literals
1. String Operations
2. String Comprehensions / Slicing
3. String Methods

7 | For Loops

1. Range function
2. For loop
3. Nested For Loops
4. Pattern-Based Questions
5. Break
6. Continue
7. Pass
8. Loop else

8 | Functions

1. Definition
2. Call
3. Function Arguments
4. Default Arguments
5. Docstrings
6. Scope
7. Special functions Lambda, Map, and Filter
8. Recursion
9. Functional Programming and Reference Functions

9 | Dictionary

1. Dictionaries Basics
2. Operations
3. Comprehensions
4. Dictionaries Methods

10 | Tuple

1. Tuples Basics
2. Tuples Comprehensions / Slicing
3. Tuple Functions
4. Tuple Methods

11 | Set

1. Sets Basics
2. Sets Operations
3. Union
4. Intersection
5. Difference and Symmetric Difference

12 | Object-Oriented Programming

1. Classes
2. Objects
3. Method Calls
4. Inheritance and Its Types
5. Overloading
6. Overriding
7. Data Hiding
8. Operator Overloading

13 | File Handling

1. File Basics
2. Opening Files
3. Reading Files
4. Writing Files
5. Editing Files
6. Working with different extensions of file
7. With Statements

14 | Exception Handling

1. Common Exceptions
2. Exception Handling
    a. Try
    b. Except
    c. Try except else
    d. Finally
    e. Raising exceptions
    f. Assertion

15 | Regular Expression

1. Basic RE functions
2. Patterns
3. Meta Characters
4. Character Classes

16 | Modules & Packages

1. Different types of modules
2. Inbuilt modules
    a. OS
    b. Sys
    c. Statistics
    d. Math
    e. String
    f. Random
3. Create your own module
4. Building Packages
5. Build your own python module and deploy it on pip

17 | Data Structures

1. Stack
2. Queue
3. Linked Lists
4. Sorting
5. Searching
    a. Linear Search
    b. Binary Search

18 | Higher-Order Functions

1. Function as a parameter
2. Function as a return value

3. Closures
4. Decorators
5. Map, Filter, Reduce Functions

19 | Python Web Scrapping

1. Understanding BeautifulSoup
2. Extracting Data from websites
3. Extracting Tables
4. Data in JSON format

20 | Virtual Environment

1. Virtual Environment Setup

21 | Web Application Project

1. Flask
2. Project Structure
3. Routes
4. Templates
5. Navigations

22 | Git and GitHub

1. Git - Version Control System
2. GitHub Profile building
3. Manage your work on GitHub

23 | Deployment

1. Heroku Deployment
2. Flask Integration

24 | Python Package Manager

1. What is PIP?
2. Installation

3. PIP Freeze
4. Creating Your Own Package
5. Upload it on PIP

25 | Python with MongoDB Database

1. SQL and NoSQL
2. Connecting to MongoDB URI
3. Flask application and MongoDB integration
4. CRUD Operations
5. Find
6. Delete
7. Drop

26 | Building API

1. API (Application Programming Interface)
2. Building API
3. Structure of an API
4. PUT
5. POST
6. DELETE
7. Using Postman

27 | Statistics with NumPy

1. Statistics
2. NumPy basics
3. Working with Matrix
4. Linear Algebra operations
5. Descriptive Statistics

28 | Data Analysis with Pandas

1. Data Analysis basics

2. Dataframe operations
3. Working with 2-dimensional data
4. Data Cleaning
5. Data Grouping

29 | Data Visualization with Matplotlib

1. Matplotlib Basics
2. Working with plots
3. Plot
4. Pie Chart
5. Histogram