

Getting Started with Python

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Introduction to Python

1. Introduction and Overview

- What is Python?
- History of Python
- Python's popularity and applications
- Installing Python
- Setting up the environment (IDEs and text editors)

2. Python Basics

- Writing and running your first Python program
- Understanding the Python interpreter
- Interactive mode vs. script mode

Basic Syntax and Data Types

3. Python Syntax and Indentation

- Python syntax rules
- The significance of indentation
- Code blocks and proper formatting

4. Comments and Docstrings

- Single-line comments
- Multi-line comments
- Docstrings for documentation

Basic Syntax and Data Types ... continued...

5. Variables

- Variable naming conventions
- Assigning values to variables
- Variable types and mutability

6. Data Types

- Built-in data types: int, float, str, bool, None
- Type conversion (casting)
- Checking data types with type()

7. String Handling

- Creating and manipulating strings
- String methods and formatting
- Escape sequences
- String slicing and indexing

Operators and Expressions

8. Operators

- Arithmetic operators
- Comparison operators
- Logical operators
- Assignment operators
- Bitwise operators

9. Expressions and Statements

- Expression evaluation
- Statement types
- Operator precedence and associativity

Control Flow

10. Conditional Statements

- if, elif, else statements
- Nested conditions
- Ternary (conditional) operator

11. Loops

- while loop
- for loop
- Loop control statements: break, continue, pass

12. Comprehensions

- List comprehensions
- Dictionary comprehensions
- Set comprehensions

Functions

13. Defining and Calling Functions

- Function syntax and indentation
- Function arguments and return values

14. Advanced Function Topics

- Default and keyword arguments
- Variable-length arguments (*args, **kwargs)
- Anonymous functions (lambda functions)
- Recursive functions

15. Variable Scope

- Local and global variables
- The global and nonlocal keywords

Modules and Packages

16. Modules

- Importing modules
- import statement
- from ... import ... statement
- Aliasing modules

17. Standard Library Modules

- Commonly used modules: math, datetime, os, sys, random
- Using and exploring the standard library

18. Packages

- Creating and using packages
- Installing and using third-party packages with pip

Data Structures

19. Lists

- Creating, accessing, and modifying lists
- List methods
- List comprehensions

20. Tuples

- Creating and using tuples
- Tuple methods and immutability

21. Dictionaries

- Creating, accessing, and modifying dictionaries
- Dictionary methods
- Dictionary comprehensions

Data Structures ... continued...

22. Sets

- Creating and using sets
- Set methods
- Set operations (union, intersection, difference)

File Handling

23. Reading and Writing Files

- Opening files
- Reading from files
- Writing to files
- Closing files
- Context managers (with statement)

24. Working with CSV and JSON Files

- csv module
- json module

Exception Handling

25. Understanding Exceptions

- Common exceptions in Python
- The try, except, else, finally blocks
- Raising exceptions
- Creating custom exceptions

Object-Oriented Programming (OOP)

26. Classes and Objects

- Defining classes
- Creating objects
- Instance variables and methods

27. Advanced OOP Topics

- Class variables and methods
- Inheritance (single and multiple)
- Polymorphism
- Encapsulation and data hiding
- Special methods (___init___, ___str___, etc.)

Iterators and Generators

28. Iterators

- The iterator protocol
- Creating custom iterators

29. Generators

- Generator functions
- The yield statement
- Generator expressions

Decorators and Context Managers

30. Decorators

- Function decorators
- Class decorators

31. Context Managers

- The with statement
- Creating custom context managers using ___enter___ and ___exit___

Decorators and Context Managers

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- The with statement
- Creating custom context managers using `__enter__` and `__exit__`

Regular Expressions

32. Introduction to Regular Expressions

- Using the re module
- Compiling regular expressions
- Matching patterns
- Searching and replacing
- Using groups

Working with Dates and Times

33. The datetime Module

- Dates
- Times
- DateTime objects
- Timedeltas
- Formatting and parsing dates

Networking and Web Scraping

34. Basic Networking with socket

- Creating simple client-server applications

35. HTTP Requests with requests

- Making GET and POST requests
- Handling responses

36. Web Scraping with BeautifulSoup

- Parsing HTML
- Extracting data

Working with Data

37. Numpy

- Working with arrays
- Mathematical operations on arrays

38. Pandas

- Data manipulation and analysis
- Working with DataFrames

Coming soon !!!