# Python Documentation (Summarized)

## 1. Introduction to Python

Python is a high-level, interpreted, and general-purpose programming language.  
It supports multiple programming paradigms, including structured, object-oriented, and functional programming.  
Python is known for its readability, simplicity, and vast standard library.

## 2. Basic Syntax

Python uses indentation to define code blocks instead of braces.  
Example:  
 if True:  
 print("Hello, World!")

## 3. Data Types

Common built-in data types include:  
- int: Integer numbers  
- float: Decimal numbers  
- str: Text strings  
- bool: True/False  
- list, tuple, set, dict: Collection types

## 4. Control Flow

Python provides conditional statements and loops:  
- if, elif, else for decision making  
- for and while loops for iteration  
- break, continue, pass for loop control

## 5. Functions

Functions are defined using the 'def' keyword.  
Example:  
 def greet(name):  
 return "Hello, " + name  
Functions can have default parameters and keyword arguments.

## 6. Object-Oriented Programming (OOP)

Python supports OOP principles:  
- Classes and Objects  
- Inheritance  
- Polymorphism  
- Encapsulation  
Example:  
 class Person:  
 def \_\_init\_\_(self, name):  
 self.name = name  
 def greet(self):  
 print("Hi, I'm", self.name)

## 7. Modules and Packages

Modules are files containing Python code (.py).  
Packages are collections of modules.  
Import using:  
 import module\_name  
or  
 from module\_name import function\_name

## 8. Exception Handling

Python uses try-except blocks to handle errors.  
Example:  
 try:  
 x = 1 / 0  
 except ZeroDivisionError:  
 print("Cannot divide by zero!")

## 9. File Handling

File operations are performed using open():  
Example:  
 with open('file.txt', 'r') as f:  
 content = f.read()

## 10. Libraries and Frameworks

Python has a rich ecosystem:  
- Data Science: NumPy, Pandas, Matplotlib  
- Web Development: Django, Flask  
- Machine Learning: TensorFlow, scikit-learn  
- Automation: Selenium, PyAutoGUI

## 11. Conclusion

Python is versatile, powerful, and easy to learn.  
It’s widely used in web development, data science, AI, scripting, and more.