

Python Certification

Chapter 1: Python Basics

1. Introduction to Python Language
2. Python installation – Windows, Mac & Linux distribution for Anaconda Python
3. Data types in Python
4. Variables, Operators (Arithmetic, Comparison and logical), and input/output, comments
5. Decision Making- if else, if-elif-else, Looping- while, for, break and continue statement and range function
6. String Objects- inbuilt methods, splitting and joining strings, format functions
7. **Hands-On-Exercises**

Chapter 2: Python Data Structures

1. List and its Operations
2. Tuple and its Operations
3. Set and its Operations
4. Dictionaries and its Operations
5. Python Arrays
6. Data comprehension
7. **Hands-On-Exercises**

Chapter 3: Python Functions

1. Introduction to Functions, def keyword, function call, function arguments, return types
2. Recursion
3. *args and **kwargs in Python, Tuple Unpacking
4. Lambda Expressions, Map, and Filter Functions
5. Nested Statements and Scope
6. **Hands-On-Exercises**

Chapter 4: Python Decorators, Generators, and iterators

1. **Hands-On-Exercises**

Chapter 5: OOP concepts in Python

1. Introduction and Pillars of OOP's, Attributes and Class Keyword, Class Object Attributes and Methods
2. Objects and Constructors
3. Inheritance, Polymorphism, Encapsulation and Abstraction
4. Special Methods
5. **Hands-On-Exercises**



Chapter 6: Files

1. Working with Files
2. Reading and writing files, buffered read and write and other file methods
3. Logging and Debugger
4. Hands-On-Exercises

Chapter 7: Modules and Packages, Errors, and Exceptions Handling

1. Pip Install and PyPi, Modules and Packages, `__name__` and `"__main__"`
2. Errors and Exception Handling- Try, except and finally
3. Pylint Overview
4. Running tests with the Unittest Library
5. Hands-On-Exercises

Chapter 8: Collections

1. namedtuple()
2. deque
3. ChainMap
4. Counter
5. OrderedDict
6. defaultdict
7. UserDict
8. UserList
9. UserString
10. Hands-On-Exercises

Chapter 9: SQL Database Access

1. SQL Database management
2. Basics of SQL
3. Clause and condition
4. Writing SQL queries
5. Joins
6. Hands On Project – Car Rental System (Database creation and querying with MySQL)

Chapter 10: Writing GUI's in Python (Tkinter)

1. Introduction, Components and Events, An Example GUI
2. The root Component
3. Adding a Button, Entry Widgets, Text Widgets, Check buttons
4. Hands on Project – Car Rental System (UI creation and database connectivity created earlier)



Chapter 11: Network Programming

1. Introduction
2. A Daytime Server
3. Clients and Servers
4. The Client Program
5. The Server Program
6. Hands On Project – Chat Application (Without UI, only terminal based)

Chapter 12: Date and Time

1. Sleep
2. Program execution time
3. more methods on date/time
4. Hands On Project – Digital and Analog Clock (Tkinter and datetime)

Chapter 13: Regular Expression

1. Split, Working with special characters, date, emails
2. Quantifiers
3. Match and find all, character sequence and substitute
4. Search method
5. Hands On Project – Application to check the strong password checker (Tkinter)

Chapter 14: Threads ESSENTIAL

1. Class and threads
2. Multi-threading
3. Synchronization
4. Treads Life cycle
5. use cases
6. Hands On Exercises- Square and Cube, checking the time consumed by each thread etc.

Chapter 15: Other topics

1. Frozen set
2. Type Hinting
3. any() and all()
4. yapf and pylint
5. Specialized Sorts
6. Project integration with Versions Control Systems – Git, SVN etc.
7. Image Processing – Conversion to different image types
8. PDFs with python
9. Sending emails with smtplib and mailgun
10. SMS updates with python and sinch
11. Hands On Project –Car Rental System with updates via SMS and Mails