



Python Intermediate Course Content

Data Science

Duration: 4 Weeks
(2.5- 3 hours per day)

1. Why Python.
 - a. Language Popularity
 - b. Job Trends
 - c. Areas where Python is used.
 - d. Companies using Python and Examples.
 - e. History of Python
 - f. Compiled and Interpreted Languages.
 - g. Why Python as hybrid language.
2. Installation – Python.
 - a. Versions (2.7+ vs 3.0+)
 - b. Available IDEs, Comparison
 - c. Installation of Python and pyCharm.
 - d. IDLE and the interactive shell.
 - e. Basic operations on the shell.
 - f. Running the script file.
3. Python Data Types
 - a. Boolean

- b. Numbers
- c. Strings (Slicing)
- d. Lists
- e. Dictionary
- f. Tuple
- g. Variable Assignments
- h. Range
- i. Sets

4. Operations

- a. Arithmetic Operators
- b. Relational Operators
- c. Logical Operators
- d. + (Plus)
- e. * (Multiplication)
- f. In

5. Conditional Statements

- a. *If* Statement (*elif*, *else*)
- b. *for* Statement
- c. *while* Statement
- d. *break* and *continue* Statement
- e. *pass* keyword
- f. List Comprehension
- g. Dictionary Comprehension
- h. Nested Comprehension

6. Functions

- a. Definition and calling a function
- b. Pass by Reference vs Value

- c. Functions Arguments (Required, Keyword, Default, Variable Length)
- d. Anonymous (lambda) Functions
- e. *Return* statement
- f. Scope of Variables (Global vs Local)
- g. Unpacking Arguments
- h. Args and kwargs.

7. File I/O

- a. Reading Keyboard Inputs
- b. input function
- c. Opening and Closing Files.
- d. Reading and Writing Files.

8. Modules

- a. Basics
- b. Search Path
- c. Globals() and locals()
- d. Dir() function
- e. Packages (Basics, Importing from packages, examples)

9. Classes

- a. Classes and objects
- b. Init function
- c. Class vs Instance Variables vs Static Variables
- d. Inheritance
- e. Multiple Inheritance

10. Exception Handling

- a. Standard Exceptions
 - b. Assertions
 - c. Handling
 - d. Try-finally, except
 - e. Raising an Exception
 - f. Custom Exception
11. Standard Libraries
- a. Sys
 - b. Datetime
 - c. Random
 - d. Math
 - e. Pickle
 - f. Os
12. Data Structures
- a. Min, Max and Sorting on collections/classes
 - b. Zip
 - c. Maps
 - d. Bitwise Operators
13. Regular Expressions
- a. What are Regular Expressions
 - b. Matching Characters, Searching
 - c. Compiling Regular Expressions
 - d. Split
 - e. Findall
 - f. Search

- g. Ignore case vs normal search
 - h. Repetition
 - i. Emails Example
 - j. Group Extraction
14. Database Programming
- a. Connecting to Database Server
 - b. Connecting to different databases like Mysql/SQLite
 - c. CRUD Operations
 - d. Transactions Management
15. Threads
- a. Introduction to Threads
 - b. Thread Creation
 - c. Locking Mechanisms
 - d. Different ways of calling threads, class vs functional approach
16. Introduction Data Science
- a. Introduction to data science packages,
 - b. Using numpy and pandas
 - c. Reading CSV files
 - d. Extracting Data from CSV files.