



Python Fundamentals

The simple step-by-step guide mastering in Python concepts.

Data Automation (Excel, SQL, CSV, PDF)
Data Analytics using **Pandas** and **NumPy**
Data Visualization using **Matplotlib**



Syllabus

Introduction To Python:

- ❖ Installation and Working with Python
- ❖ Understanding Python variables
- ❖ Python basic Operators
- ❖ Understanding the Python blocks.

Introduction To Variables:

- ❖ Variables, expression condition and function
- ❖ Global and Local Variables in Python
- ❖ Packing and Unpacking Arguments
- ❖ Type Casting in Python
- ❖ Byte objects vs. string in Python
- ❖ Variable Scope

Python Data Type :

- ❖ Declaring and using Numeric data types
- ❖ Using string data type and string operations
- ❖ Understanding Non-numeric data types
- ❖ Understanding the concept of Casting and Boolean.
- ❖ Strings
- ❖ List
- ❖ Tuples
- ❖ Dictionary
- ❖ Sets

Introduction Keywords and Identifiers and Operators

- ❖ Python Keyword and Identifiers
- ❖ Python Comments, Multiline Comments.
- ❖ Python Indentation
- ❖ Understating the concepts of Operators

Fortunately, Learning to Automate anything with Python Doesn't Have to be Difficult

Data Structure

List

- ❖ What is List.
- ❖ List Creation
- ❖ List Length
- ❖ List Append
- ❖ List Insert
- ❖ List Remove
- ❖ List Append & Extend using “+” and Keyword
- ❖ List Delete
- ❖ List related Keyword in Python
- ❖ List Revers
- ❖ List Sorting
- ❖ List having Multiple Reference
- ❖ String Split to create a List
- ❖ List Indexing
- ❖ List Slicing
- ❖ List count and Looping
- ❖ List Comprehension and Nested Comprehension

Dictionary

- ❖ Dict Creation
- ❖ Dict Access (Accessing Dict Values)
- ❖ Dict Get Method
- ❖ Dict Add or Modify Elements
- ❖ Dict Copy
- ❖ Dict FromKeys.
- ❖ Dict Items
- ❖ Dict Keys (Updating, Removing and Iterating)
- ❖ Dict Values
- ❖ Dict Comprehension
- ❖ Default Dictionaries
- ❖ Ordered Dictionaries
- ❖ Looping Dictionaries
- ❖ Dict useful methods (Pop, Pop Item, Str , Update etc.)

Continue

Sets, Tuples and Looping Programming

Sets

- ❖ What is Set
- ❖ Set Creation
- ❖ Add element to a Set
- ❖ Remove elements from a Set
- ❖ Python Set Operations
- ❖ Frozen Sets

Tuple

- ❖ What is Tuple
- ❖ Tuple Creation
- ❖ Accessing Elements in Tuple
- ❖ Changing a Tuple
- ❖ Tuple Deletion
- ❖ Tuple Count
- ❖ Tuple Index
- ❖ Tuple Membership
- ❖ Tuple Built in Function (Length, Sort)

Control Flow

- ❖ Loops
- ❖ Loops and Control Statements (Continue, Break and Pass).
- ❖ Looping techniques in Python
- ❖ How to use Range function in Loop.
- ❖ Programs for printing Patterns in Python
- ❖ How to use if and else with Loop
- ❖ Use of Switch Function in Loop
- ❖ Elegant way of Python Iteration
- ❖ Generator in Python
- ❖ How to use nested IF and Else in Python
- ❖ How to use nested Loop in Python
- ❖ Use If and Else in For and While Loop
- ❖ Examples of Looping with Break and Continue Statements
- ❖ How to use IN or NOT keyword in Python Loop.



Exception and File Handling, Module ,Function and Packages

Python Exception Handling

- ❖ Python Errors and Built-in-Exceptions
- ❖ Exception handling Try, Except and Finally
- ❖ Catching Exceptions in Python
- ❖ Catching Specific Exception in Python
- ❖ Raising Exception
- ❖ Try and Finally

Python File Handling

- ❖ Opening a File
- ❖ Python File Modes
- ❖ Closing a File
- ❖ Writing to a File
- ❖ Reading from a File
- ❖ Renaming and Deleting Files in Python
- ❖ Python Directory and File Management
- ❖ List Directories and Files
- ❖ Making New Directory
- ❖ Changing Directory

Python Function, Modules and Packages

- ❖ Python Syntax
- ❖ Function Call
- ❖ Return Statement
- ❖ Write an Empty Function in Python – pass statement.
- ❖ Lamda / Anonymous Function
- ❖ *args and **kwargs
- ❖ Help function in Python
- ❖ Scope and Life Time of Variable in Python Function
- ❖ Nested Loop in Python Function
- ❖ Recursive Function and Its Advantage and Disadvantage
- ❖ Organizing python codes using functions
- ❖ Organizing python projects into modules
- ❖ Importing own module as well as external modules
- ❖ Understanding Packages
- ❖ Programming using functions, modules & external packages
- ❖ Map, Filter and Reduce function with Lambda Function
- ❖ More example of Python Function

Continue



Python OOps and Database, Excel and Email Automation using Python.

Python Object Oriented Programming—Oops

- ❖ Concept of Class, Object and Instances
- ❖ Constructor, Class attributes and Destructors
- ❖ Real time use of class in live projects
- ❖ Inheritance, Overlapping and Overloading operators
- ❖ Adding and retrieving dynamic attributes of classes
- ❖ Programming using Oops support

Python Database Interaction

- ❖ SQL Database connection using Python
- ❖ Creating and searching tables
- ❖ Reading and Storing config information on database
- ❖ Programming using database connections

Python Contacting user Through Emails Using Python

- ❖ Installing SMTP Python Module
- ❖ Sending Email
- ❖ Reading from file and sending emails to all users

Working With Excel

- ❖ Reading an excel file using Python
- ❖ Writing to an excel sheet using Python
- ❖ Python | Reading an excel file
- ❖ Python | Writing an excel file
- ❖ Adjusting Rows and Column using Python
- ❖ Arithmetic Operation in Excel file.
- ❖ Plotting Pie Charts
- ❖ Plotting Area Charts
- ❖ Plotting Bar or Column Charts using Python.
- ❖ Plotting Doughnut Charts using Python.
- ❖ Consolidation of Excel File using Python
- ❖ Split of Excel File Using Python.
- ❖ Play with Workbook, Sheets and Cells in Excel using Python
- ❖ Creating and Removing Sheets
- ❖ Formatting the Excel File Data
- ❖ More example of Python Function



Automation of PDF and Date Time, Calendar Module

Working with PDF and MS Word using Python

- ❖ Extracting Text from PDFs
- ❖ Creating PDFs
- ❖ Copy Pages
- ❖ Split PDF
- ❖ Combining pages from many PDFs
- ❖ Rotating PDF's Pages
- ❖ Opening PDF Files

Complete Understanding of OS Module of Python

- ❖ Check Dirs. (exist or not)
- ❖ How to split path and extension
- ❖ How to get user profile detail
- ❖ Get the path of Desktop, Documents, Downloads etc.
- ❖ Handle the File System Organization using OS
- ❖ How to get any files and folder's details using OS

Python Date Time and Calendar:

- ❖ Day, Month, Year, Today, Weekday
- ❖ Iso Week day
- ❖ Date Time
- ❖ Time, Hour, Minute, Sec, Microsec
- ❖ Time Delta and UTC
- ❖ Strftime, Now
- ❖ Time stamp and Date Format
- ❖ Month Calendar
- ❖ Itermonthdates
- ❖ Lots of Example on Python Calendar
- ❖ Create 12 month Calendar
- ❖ **Strftime**
- ❖ **Strptime**
- ❖ **Format Code list of Data, Time and Cal**
- ❖ **Locale's appropriate date and time**

Data Analysis and Visualization using Pandas, NumPy and Matplotlib

- ❖ Read data from Excel File using Pandas
- ❖ How to get record specific records Using Pandas
- ❖ Using the Excel File class to read multiple sheets
- ❖ Exploring the Data
- ❖ Getting statistical information about the data
- ❖ Reading files with no header and skipping records
- ❖ Reading a subset of columns
- ❖ Applying formulas on the columns
- ❖ Complete Understanding of Pivot Table
- ❖ Understanding the Properties of Pivot Table in Pandas
- ❖ Exporting the results to Excel
- ❖ Python | Pandas DataFrame
- ❖ Understanding the properties of DataFrame
- ❖ Indexing and Selecting Data with Pandas
- ❖ Pandas | Merging, Joining and Concatenating
- ❖ Pandas | Find Missing Data and Fill and Drop NA
- ❖ Pandas | How to Group Data
- ❖ Other Very Useful concepts of Pandas in Python

Pandas

More Plotting, Date Time Indexing and writing to files
Adding & Resetting Columns, Mapping with function
More Mapping, Filling NaN values
Plotting, Correlations, and Histograms
Analysis Concepts, Handle the None Values
Cumulative Sums and Value Counts, Ranking etc
Data Maintenance, Adding/Removing Cols and Rows
Basic Grouping, Concepts of Aggregate Function
Data Slicing using iLoc and Loc property (Setting Indices)
Advanced Reading CSVs/HTML, Binning, Categorical Data
Joins:
Inner Join
Left Join (Left Outer Join)
Right Join (Right Outer Join)
Full Join (Full Outer Join)
Appending DataFrame and Data
How to apply Lambda / Function on DataFrame
DateTime Property in Pandas (More and More)

Data Analysis and Visualization using Pandas, NumPy and Matplotlib

NumPy

- ❖ Introduction to NumPy: Numerical Python
- ❖ Importing NumPy and Its Properties
- ❖ NumPy Arrays
- ❖ Creating an Array from a CSV
- ❖ Operations an Array from a CSV
- ❖ Operations with NumPy Arrays
- ❖ Two-Dimensional Array
- ❖ Selecting Elements from 1-D Array
- ❖ Selecting Elements from 2-D Array
- ❖ Logical Operation with Arrays
- ❖ Indexing NumPy elements using conditionals
- ❖ NumPy's Mean and Axis
- ❖ NumPy's Mode, Median and Sum Function
- ❖ NumPy's Sort Function and More

Matplotlib

- ❖ Bar Chart using Python Matplotlib
- ❖ Column Chart using Python Matplotlib
- ❖ Pie Chart using Python Matplotlib
- ❖ Area Chart using Python Matplotlib
- ❖ Scatter Plot Chart using Python Matplotlib
- ❖ Play with Charts Properties Using Matplotlib
- ❖ Export the Chart as Image
- ❖ Understanding plt.subplots() notation
- ❖ Legend Alignment of Chart using Matplotlib
- ❖ Create Charts as Image
- ❖ Other Useful Properties of Charts.
- ❖ Complete Understanding of Histograms
- ❖ Plotting Different Charts, Labels, and Labels Alignment etc.

Other Useful

- ❖ Complete Understanding of IterTool (IterTool Product, Permutations(), Combindations() etc)
- ❖ Zip, Product, Combinations_with_replacement etc.

Projects:

Project-1

Project-2

Project-3

Interview Questions

100 Real Interview Questions

