

CORE PYTHON SYLLABUS

Introduction to Script

- What is Script, program?
- Types of Scripts
- Difference between Script and Programming Languages
- Features and Limitation of Scripting
- Types of programming Language Paradigms

Introduction to Python

- History of Python
- Who Uses Python?
- Characteristics of Python
- How to Download and Install Python
- Install Python with Diff IDEs
- Features and Limitations of Python
- Python Applications
- Creating Your First Python Program

Different Modes in Python

- Execute the Script
- Interactive and Script Mode
- Python File Extensions
- SETTING PATH IN Windows
- Immediate mode
- Script mode
- IDLE mode
- Quit the Python Shell
- Shell as a Simple Calculator

Python Basics

- Python Comments
- Order of operations
- Multiline Statements
- Quotations in Python
- Python Path Testing
- Joining two lines
- Python Implementation Alternatives
- Doc string
- Uses of Python in Data Science, IoT

Variables in Python

- What is Variable?
- Variables and Constants in Python
- Values and Types
- Multiple Assignment
- Python different numerical types
- Standard Data Types
- Python Mathematics
- Type Conversion
- Mutable Versus Immutable Objects

Python Operators and Operands

- Arithmetic operator
- Relational Operators and Comparison Operators
- Python Assignment Operators
- Short hand Assignment Operators
- Logical Operators
- Bitwise Operators
- Membership Operators
- Identity Operators
- Operator precedence
- Evaluating Expressions

Python Conditional Statements

- How to use “if condition” in conditional structures
- if statement (One-Way Decisions)
- if .. else statement (Two-way Decisions)
- How to use “else condition”
- if .. elif .. else statement (Multi-way)
- When “else condition” does not work
- How to use “elif” condition
- Nested IF Statement

Python LOOPS

- How to use “While Loop” and “For Loop”
- How to use For Loop for set of other things besides numbers
- Break statements, Continue statement, Enumerate function for For Loop
- Practical Example
- How to use for loop to repeat the same statement over and again
- Break, continue statements

Data structure (sequences or collections in Python)

- Strings
- Set
- Lists
- Tuples
- dictionary

Python Lists

- Lists are mutable
- Getting to Lists
- List indices
- Traversing a list
- List operations, slices and methods
- Map, filter and reduce
- Deleting elements
- Lists and strings
- List functions

Python Tuple

- Advantages of Tuple over List
- Packing and Unpacking
- Comparing tuples
- Creating nested tuple
- Using tuples as keys in dictionaries
- Deleting Tuples
- Slicing of Tuple
- Tuple Membership Test
- Built-in functions with Tuple
- Functions applied on tuples
- Tuple functions

Python Sets

- How to create a set?
- Iteration Over Sets
- Python Set Methods
- Python Set Operations
- Built-in Functions with Set
- Python Frozenset

Python Dictionary

- How to create a dictionary?
- PYTHON HASHING?
- Python Dictionary Methods
- Copying dictionary
- Updating Dictionary
- Delete Keys from the dictionary
- Dictionary items() Method
- Sorting the Dictionary
- Python Dictionary in-built Functions
- Dictionary len() Method
- Variable Types
- Python List cmp() Method
- Dictionary Str(dict)

Python Functions

- What is a function?
- How to define and call a function in Python
- Types of Functions
- Significance of Indentation (Space) in Python
- How Function Return Value?
- Types of Arguments in Functions
- Default Arguments and Non-Default Arguments
- Keyword Argument and Non-keyword Arguments
- Arbitrary Arguments
- Rules to define a function in Python
- Various Forms of Function Arguments
- Scope and Lifetime of variables
- Nested Functions
- Call By Value, Call by Reference
- Anonymous Functions/Lambda functions
- Passing functions to function

Python Modules

- What is a Module?
- Types of Modules
- The import Statement
- The from...import Statement
- ..import * Statement
- Underscores in Python
- The dir() Function
- Creating User defined Modules
- Command line Arguments
- Python Module Search Path
- The Math module

Packages in Python

- What is a Package?
- Introduction to Packages?
- py file
- Importing module from a package
- Creating a Package
- Creating Sub Package
- Importing from Sub-Packages
- Popular Python Packages

Object oriented programming with python

- Introduction to OOPs Programming
- Object Oriented Programming System
- OOPS Principles
- Define Classes
- Creating Objects
- Class variables and Instance Variables Constructors
- Basic concept of Object and Classes
- Access specifier
- Access Modifiers
- How to define Python classes

Constructors and destructors

- What is constructor
- Use of `__init__()`
- Parameterized constructor
- Destructors
- Use of `del` keyword
- Python Namespace
- Self-variable in python
- Garbage Collection

Inheritance and polymorphism

- What is Inheritance?
- Types of Inheritance?
- How Inheritance works?
- Python Multiple Inheritance
- Overloading and Over Riding
- Polymorphism
- Abstraction
- Encapsulation
- Built-In Class Attributes
- Abstract class

Python Exception Handling

- Python Errors
- Common RunTime Errors in PYTHON
- Abnormal termination
- Chain of importance Of Exception
- Exception Handling
- Try ... Except
- Try .. Except .. else
- Try ... finally
- Argument of an Exception
- Python Custom Exceptions
- Ignore Errors
- Assertions
- UsingAssertionsEffectively

File Handling

- What is a data, Information File?
- File Objects
- File Different Modes and Object Attributes
- How to create a Text Fil and Append Data to a File and Read a File
- Closing a file
- Read, read line ,read lines, write, write lines...!!
- Renaming and Deleting Files
- Directories in Python

Multithreading

- Thread based multi-tasking
- Creating a Thread without using class
- Creating thread using class
- Comparing running time of multithreaded program
- Sleep () method
- Join () method
- Getting and setting name of Thread
- Logging module
- Synchronization
- Lock concept
- Inter thread communication
- Is_Alive () method
- Active_count () method
- Enumerate () method
- Current_thread () method
- Daemon Thread

GUI Programming with Tkinter

- Creating a window
- Setting geometry
- Tkinter widgets
- canvas
- Label
- Button
- Entry
- Message box
- List
- Radio Button
- Check Button
- Creating Frame
- Creating Menu
- Creating scales assignments on tkinter