

Python

- **Core Python**
- **Introduction to Languages**
- **Introduction to Python**
- **Python Software's**
- **Python Language**

Fundamentals

- Keywords
- Identifiers
- Constants / Literals
- Data types
- Python Syntax

Different Modes of Python

- Interactive Mode
- Scripting Mode
- Programming Elements
- Structure of Python program
- First Python Application
- Comments in Python
- Python file extensions
- Setting Path in Windows
- Edit and Run python program without IDE
- Edit and Run python program using IDEs
- INSIDE PYTHON
- Programmers View of Interpreter
- Inside INTERPRETER
- What is Byte Code in PYTHON?
- Python Debugger

Python Variables

- bytes Data Type
- byte array
- String Formatting in Python
- Math, Random, Secrets Modules
- Introduction
- Initialization of variables
- Local variables
- Global variables
- 'global' keyword
- Input and Output operations
- Data conversion functions - int(), float(), complex(), str(), chr(), ord()
- Difference between "is" vs "=="

Input & Output Operators

- Print
- Input
- Command-line arguments

Control Statements

- Statements
- Conditional control statements
- If
- If-else
- If-elif-else
- Nested-if
- Loop control statements
- for
- while
- Nested loops
- Branching statements
- Break
- Continue
- Pass
- Return
- Case studies

List Collection

- What is List
- Need of List collection
- Different ways of creating List
- List comprehension
- List indices
- Processing elements of List through Indexing
- and Slicing
- List object methods
- List is Mutable
- Mutable and Immutable elements of List, Nested Lists
- List_of_lists
- Hardcopy, shallowCopy and DeepCopy
- zip() in Python
- How to unzip?
- Python Arrays:
- Case studies

Tuple Collection

- What is tuple?
- Different ways of creating Tuple
- Method of Tuple object
- Tuple is Immutable
- Mutable and Immutable elements of Tuple
- Process tuple through Indexing and Slicing
- List u/s Tuple
- Case studies

Set Collection

- What is set?
- Different ways of creating set
- Difference between list and set
- Iteration Over Sets
- Accessing elements of set
- Python Set Methods
- Python Set Operations
- Union of sets
- functions and methods of set
- Python Frozen set
- Difference between set and frozenset?
- Case study

Dictionary Collection

- What is dictionary?
- Difference between list, set and dictionary.
- How to create a dictionary?
- PYTHON HASHING?
- Accessing values of dictionary
- Python Dictionary Methods
- Copying dictionary
- Updating Dictionary
- Reading keys from Dictionary
- Reading values from Dictionary
- Reading items from Dictionary
- Delete Keys from the dictionary
- Sorting the Dictionary
- Python Dictionary Functions and methods
- Dictionary comprehension

Functions

- What is Function?
- Advantages of functions
- Syntax and Writing function
- Calling or Invoking function
- Classification of Functions

- No arguments and No return values
- With arguments and No return values
- With arguments and With return values
- No arguments and With return values
- Recursion
- Python argument type functions :
- Default argument functions
- Required(Positional) arguments function
- Keyword arguments function
- Variable arguments functions
- 'pass' keyword in functions
- Lambda functions/Anonymous functions
- map()
- filter()
- reduce()
- Nested functions
- Non local variables, global variables
- Closures
- Decorators
- Generators
- Iterators
- Monkey patching

Packages

- Organizing python project into packages
- Types of packages - pre defined, user defined.
- Package u/s Folder
- py file
- Importing package
- PIP
- Introduction to PIP
- Installing PIP
- Installing Python packages
- Un installing Python packages

OOPs

- procedural u/s Object oriented programming
- Principles of OOP - Encapsulation , Abstraction(Data Hiding)
- Classes and Objects
- How to define class in python
- Types of variables - instance variables, class variables.

- Types of methods - instance methods,
- class method, static method
- Object initialization
- 'self' reference variable
- 'cls' reference variable
- Access modifiers - private(__), protected(__), public
- AT property class
- Property() object
- Creating object properties using setattr, getattr functions
- Encapsulation(Data Binding)
- What is polymorphism?
- Overriding
 - i) Method overriding
 - ii) Constructor overriding
- Overloading
 - i) Method Overloading
 - ii) Constructor Overloading

iii) Operator Overloading.

- Class re-usability
- Composition
- Aggregation
- Inheritance - single , multi level, multiple,
- hierarchical and hybrid inheritance and Diamond inheritance
- Constructors in inheritance
- Object class
- super()
- Runtime polymorphism
- Method overriding
- Method resolution order(MRO)
- Method overriding in Multiple inheritance and
- Hybrid Inheritance
- Duck typing
- Concrete Methods in Abstract Base Classes
- Difference between Abstraction & Encapsulation
- Inner classes
- Introduction
- Writing inner class
- Accessing class level members of inner class
- Accessing object level members of inner class
- Local inner classes
- Complex inner classes
- Case studies

Exception Handling & Types of Errors

- What is Exception?
- Why exception handling?
- Syntax error u/s Runtime error
- Exception codes - AttributeError, ValueError,
- IndexError, TypeError...
- Handling exception - try except block
- Try with multi except
- Handling multiple exceptions with single
 - except block
 - Finally block
 - Try-except-finally
 - Try with finally
 - Case study of finally block
 - Raise keyword
 - Custom exceptions / User defined exceptions
 - Need to Custom exceptions
 - Case studies

Regular expressions

- Understanding regular expressions
- String u/s Regular expression string
- "re" module functions
- Match()
- Search()
- Split()
- Findall()
- Compile()
- Sub()
- Subn()
- Expressions using operators and symbols
- Simple character matches
- Special characters
- Character classes
- Mobile number extraction
- Mail extraction
- Different Mail ID patterns
- Data extraction
- Password extraction
- URL extraction
- Vehicle number extraction
- Case study

File & Directory handling

- Introduction to files
- Opening file
- File modes
- Reading data from file
- Writing data into file