

PYTHON COURSE

1. INTRODUCTION TO PYTHON

- Features of Python
- Python Virtual Machine (PVM)
- Memory management in Python
- Tour of **python.org**

2. WRITING OUR FIRST PYTHON PROGRAM

- Writing our first Python program
- Executing a Python program
- Getting help in Python
- Reopening the Python program in IDLE

3. DATATYPES IN PYTHON

- Comments in Python, Docstrings
- How Python sees variables
- Datatypes in Python
- Sequences in Python
- Literals in Python
- Determining the datatype of a variable
- Characters in Python
- Constants in Python
- Identifiers and Reserved words
- Naming conventions in Python

4. OPERATORS IN PYTHON

- Arithmetic operators
- Using Python interpreter as calculator
- Assignment operators
- Unary minus operator
- Relational operators
- Logical operators
- Boolean operators
- Membership operators
- Identity operators
- Operator precedence and associativity
- Mathematical functions

5. INPUT AND OUTPUT

- Output / Input statements
- Various formats of print()

6. COMMAND LINE ARGUMENTS

- The built in argv[] list
- Entering various elements from command prompt
- Processing command line arguments

7. CONTROL STATEMENTS

- if statement
- if ... else statement
- if ... elif ... else statement
- while loop
- for loop
- Infinite loops
- Nested loops
- break statement
- continue statement
- pass statement
- assert statement
- return statement

8. STRINGS AND CHARACTERS

- Creating strings
- Length of a string
- Indexing in strings
- Repeating the strings
- Concatenation of strings
- Checking membership
- Comparing strings
- Removing spaces from a string
- Finding sub strings
- Strings are immutable
- Replacing a string with another string
- Splitting and joining strings
- Changing case of a string
- Checking starting and ending of a string
- String testing methods
- Formatting the strings
- Sorting strings

9. LISTS AND TUPLES

- Creating lists using range() function
- Updating the elements of a list
- Concatenation of two lists
- Repetition of lists
- Membership in lists
- Aliasing and cloning lists
- Methods to process lists
- Nested lists
- List comprehensions
- Tuples
- Creating tuples
- Accessing the tuple elements
- Basic operations on tuples

10. LIST COMPREHENSIONS

- List comprehension examples

11. DICTIONARIES

- Operations on dictionaries
- Dictionary methods
- Using for loop with dictionaries
- Sorting the elements of a dictionary using lambdas
- Converting lists into dictionary
- Converting strings into dictionary

12. SET

- Creating sets
- operations on set

13. FUNCTIONS

- Defining a function
- Calling a function
- Returning results from a function
- Returning multiple values from a function
- Functions are first class objects
- Pass by object reference
- Formal and actual arguments
- Positional arguments
- keyword arguments

- Default arguments
- Variable length arguments
- Keyword-Variable length arguments
- Local and global variables
- The global keyword
- Passing a group of elements to a function
- Recursive functions
- Function decorators
- Generators

14. FILES IN PYTHON

- Types of files in Python
- Working with text files with strings
- Knowing whether a file exists or not
- Working with binary files
- JSON in Python
- Pickle in Python

15. MODULES AND PACKAGES

- Structured Programming
- Creating our own modules in Python
- The special variable `__name__`
- Creating our own Package
- Accessing the modules from the package
- Standard modules – sys
- Standard modules – math
- Standard modules – time
- Directory function

16. INTRODUCTION TO OOPS

- Problems in Procedure Oriented Approach
- Features of Object Oriented Programming System (OOPS)
- Classes and objects
- Encapsulation
- Abstraction
- Inheritance
- Polymorphism

17. CLASSES AND OBJECTS

- self variable
- Constructor

- Types of variables
- Namespaces
- Types of methods: instance, class and static
- Passing members of one class to another class
- Inner classes

18. INHERITANCE AND POLYMORPHISM

- Constructors in inheritance
- Overriding super class constructors and methods
- super() method
- Types of inheritance
- Method Resolution Order (MRO)
- Operator overloading
- Method overloading
- Method overriding

19. ABSTRACT CLASSES AND INTERFACES

- Abstract Method and Abstract Class
- Interfaces in Python
- Abstract Classes vs. Interfaces
- **Project Using OOP concept**

20. LAMBIDAS

- Introduction to Lambdas
- Using lambdas with filter() function
- Using lambdas with map() function
- Using lambdas with reduce() function
- Logging the exceptions

21. EXCEPTIONS

- Errors vs Exceptions
- Exception handling
- Types of exceptions
- The except block
- assert statement
- User- defined exceptions

22. THREADS

- Difference between process and thread
- Uses of threads
- Creating threads in Python
- Thread class methods
- Single tasking using a thread
- Multi tasking using multiple threads
- Thread synchronization
- Thread deadlock
- Daemon threads

23. NETWORKING IN PYTHON

- TCP/IP Protocol
- Sockets
- Knowing IP Address

24. PYTHON'S DATABASE CONNECTIVITY

- Python in Database
- Advantages of a DBMS over files
- Working with MySQL database in Python
- Operations on rows of a table
- Creating database tables through Python

25. REGULAR EXPRESSIONS IN PYTHON

- Sequence characters in regular expressions
- Quantifiers in regular expressions
- Special characters in regular expressions
- Using regular expressions on files
- Retrieving information from a HTML file

26. GUI (Graphical User interface)

- Tkinter in Python