1. Introduction to Python

- Python Overview
- History
- versions of Python
- Features of Python
- installing Python
- Create first program in Python
  - using shell scripting
  - using text editor
- Innards of Python
  - Python Interpreter
  - Byte Code
  - program execution
- Comparison of Python
  - java
  - JavaScript
  - c++
  - Perl

2. Dawn with Core

- Comments
- Variables
- Data Types
  - Numeric Data Type
    - Integer
    - float
    - complex
  - Boolean Data Type
    - boolean
  - Compound Data Type
    - string
    - tuple
    - set
    - list
    - Dictionaries
- keywords
- Print & input function
- Type casting
  - implicit
  - explicit
- pip
- clrprint module

3. Operators & Operands

- Operators & Operands
- Types of Operators
  - Arithmetic
  - Relational
  - Logical
  - Bitwise
  - Assignment
  - Membership
  - Identity
- Precedence & associativity

4. Control statements

- Boolean values
- Decision statements
  - if statement
  - if … else statement
  - elif statement
  - nested if statement
- Iteration control statement
  - for loop
    - range() & xrange()
  - while
  - else clause with for & while loop
- flow control statements
  - break
  - continue
  - return
  - exit
- Pass statement

5. String

- String
- ways to define a string
- accessing & slicing string
- immutable string
- string methods
- string formatting using
  - % operator
  - format()
- string operations
- string module
  - constants
  - methods
  - templates

6. Array

- Array
- array with Array Module

  - import in array
  - declare array
  - indexing & slicing
  - operation on array
  - Array methods
- array with numpy
  - import numpy
  - declare array
  - declaring multi-dimension in numpy
  - advance indexing & slicing
  - Array operation
- Numpy array vs array

7. functions

- Function
- function header & body part
- function call
- return statement

- ➢ function parameter & arguments
  - • formal parameter & actual argument
  - • default argument
  - • keyword argument
  - • arbitrary argument
- ➢ Anonymous / lambda function
- ➢ scope of Varible
  - • local
  - • global
- ➢ Recursion
  - • base case in recusion
  - • advantage & disadvantages
- ➢ Modules
  - • creating used-defined module
  - • __main__
  - • importing modules
  - • use modules in other program

8. Data collection

- ➢ Understanding data collection
- ➢ list
  - • list indexing & slicing
  - • list methods
  - • list operation
  - • list mutable
- ➢ tuple
  - • tuple indexing & slicing
  - • tuple method
  - • tuple operation
  - • tuple immutable
- ➢ Set
  - • set indexing & slicing
  - • set methods
  - • set operation
  - • set mutable
- ➢ Dictionary
  - • dictionary indexing & slicing
  - • dictionary operation
  - • dictionary method
  - • dictionary mutable
- ➢ aliasing & cloning
- ➢ data collection with in another collection
- ➢ data structure using data collection

9. OOP with Python

- ➢ OOP
- ➢ class & object
- ➢ instance variables & instance methods
- ➢ constructor & destructor as magic method
- ➢ Types of Methods
  - • instance method
  - • class method
  - • static method
- ➢ Privacy in python with access specifiers

10. Inheritance & Polymorphism

➢ Inheritance
- super class & base class
- single inheritance
- multi-level inheritance
- multiple inheritance
- hierarchical Inheritance
- Hybrid inheritance
- constructions with inheritance
- Method Resolution Order

➢ Polymorphism
- method overloading
- method overriding
- Operator overload

11. Abstract class & Interfaces

➢ Abstract Class
- Abstract Base class
- Abstract Method

➢ Interface
- interface

12. Recursion

➢ Recursion with base case
➢ significance of recursion
➢ snags of Recursion

13. Numbers,Dates Time

➢ Numbers
- Numeric types in python
- Number type conversion
- maths functions
- Random module
- Trigonometric fuction

➢ Date & Time
➢ datetime module
➢ date module
➢ time module

14. Regular Expressions

➢ Understanding Regular Expressions
➢ meta-characters
➢ regular Expression method
- compile
- search
- match
- findall
- split

15. GUI

- GUI
- drawing with Turtle
- GUI with pyQt5
  - layouts
  - widgets
- Event handling

16. File Handling

- Text File & binary File
- file modes
  - r
  - b
  - a
  - r+
  - w+
  - a+
  - rb
  - wb
  - ab
  - rb+
  - wb+
  - ab+
- file operation
  - create
  - open
  - close
  - write
  - read
  - append
  - tell
  - seek
  - rename
  - remove
- Working with directories
  - mkdir()
  - getcwd()
  - chdir()
  - rmdir()
  - glob()

17. Database with pymysql

- Database
- connection with database
- DDL queries
  - Create
  - alter
  - drop
  - rename
  - truncate
- DQL query
  - select
- DML queries
  - insert
  - update
  - delete
- ACID properties in Transactions

18. Exception handling

- Errors & exceptions
- Exception
  - Build-in Exception
  - user-defined exception
- Try-except block
- multiple except blocks
- pass statement in try-except
- else clause in try-except
- finally block
- user-defined exception

19. Socket programming

➢ Sockets
➢ TCP/IP model
➢ creating server/client with communicating
➢ Executing server client

20. Thread

➢ Process & thread
➢ thread life cycle
➢ Threads
  • creating thread
  • creating multiple threads
➢ threading module