MALLA REDDY UNIVERSITY

L/T/P/C

MR22-1ES0102 **3/-/2/4**

PYTHON PROGRAMMING

UNIT I

INTRODUCTION TO PROGRAMMING LANGUAGES: **Computer definition, Computer system, Programming languages: Types, Uses. Program development steps, Algorithm, Flowchart, Solving simple problems.**

INTRODUCTION TO PYTHON: **History of Python, Features of Python, Flavors of Python, Execution of a Python Program, Python Virtual Machine, Viewing the byte code, Comparisons between C and Python, Comments in Python, Docstrings.**

UNIT II

DATATYPES IN PYTHON: **Built-in data types: None, Numeric and Boolean data type, Sequences in python: strings, bytes, bytearrays, list, tuple, sets, frozenset, dictionaries. User-defined data types, constants in python,identifiers and reserved words, naming conventions in python.**

VARIABLES AND OPERATORS: **Understanding Python variables, multiple variable declarations. Operators in Python: Arithmetic operators, Assignment operators, Relational Operators, Logical operators, Boolean Operators, Bitwise operators, Membership operators, Identity operators. Operator Precedence and Associativity, Output statements, Input Statements and Command Line Arguments, Indentation.**

UNIT III

CONTROL STATEMENTS: **Selection: Simple if Statement, if else statements, elif statements, nested and ladderelif statements. Iteration: while loop, for loop, Infinite loop, Nested Loops, break, continue, pass statement.**

ARRAYS: **Introduction to Arrays, Creating an Array, Types of arrays, Importing the array Module and numpy, Indexing and Slicing on Arrays, Array operations.**

UNIT IV

FUNCTIONS: **Introduction, Defining a Function, calling a function, Formal and Actual Arguments, Positional Arguments, keyword Arguments, Default Arguments, variable length arguments, local and global variables, Nesting of functions and Recursion. Anonymous Functions: lambdas.**

OVERVIEW OF OBJECT-ORIENTED PROGRAMMING: **Introduction to OOPs concepts, class and object,accessing data members, method, inheritance, polymorphism, encapsulation, abstraction.**

UNIT V

EXCEPTIONS IN PYTHON: **Errors in Python Program: Compile-Time Errors, Runtime Errors, Logical Errors, Exception Handling, Types of Exceptions, and Keywords in Exception handling.**

FILES IN PYTHON: **Types of Files in python, Opening a File, Closing a File.**

REFERENCE BOOKS:

1. **R. Nageswara Rao, "Core Python Programming", dream tech**
2. **Allen B. Downey, "Think Python: How to Think like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016.**
3. **Core Python Programming, W.Chun, Pearson.**

4. **Introduction to Python, Kenneth A. Lambert, Cengag.**

Question Bank

Unit I

1. **Define Computer and brief about its Hardware and Software?**
2. **Explain about the types of Programming Languages?**
3. **Explain the steps to write an Algorithm. Write an algorithm to find sum of two numbers?**
4. **Define Flowchart and brief about the symbols of flowchart with an example program?**
5. **a) Define Python and write a short note on features of Python Programming?**

   b) Why Python is called as an Interpreted Language? Briefly explain about PVM with neat diagram?
6. **a) List the steps used to view the byte code of a python program?**

   b) Distinguish between C and Python programming?
7. **Brief about comments and documentation string in python program with a sample program?**

Unit II

1. **Classify the built-in data types based on mutable and immutable. Explain any two data types of each with example program.**
2. **a) Explain the following built-in data types**

   i) None ii) Numeric iii) Bool iv) Strings

   b) Describe the list comprehension with an example program?
3. **List few operations and methods on Tuple and dictionaries with an example programs?**
4. **Brief about Set and frozenset with an example program?**
5. **State the use of constants, identifiers, reserve words and naming conventions?**
6. **Demonstrate the following with an example program?**

   i) Assignment operator ii) Logical operator

   iii) Logical operator iv) Bitwise operator
7. **Demonstrate the following with an example programs?**

   i) Relational Operator ii) Membership operator

   iii) Identity operator iv) Operator precedence and associativity
8. **Describe about input and output statements with a sample program for each type of statement?**
9. **What is a command line argument? Explain briefly how to implement it in python programming with an examples?**

Unit III

1. **Explain elseif ladder in python programming with a sample program?**
2. **Illustrate for and while loop with an example programs?**
3. **a) Explain the following statements with flowchart and sample program**

i) break ii) continue iii) pass iv) assert

4. What is an array? Can we use List as a substitute of arrays? Justify.
5. Explain the following with a simple program

i) Creating an array ii) Accessing array elements

iii) Different ways to add an element in to array iv) Different ways to delete an element from array

v) Searching an element in array vi) Slicing on array

6. a) Mention the advantages of using Numpy module instead of array module?

b) Write short notes on the following using numpy with an example programs

i) arrange ii) reshape iii) array of zeros and ones iv) dimensions v) slicing

7. Write a program to perform the following operations on 2 dimension matrix of 3x3 size using array

i) Addition ii) Multiplication

Unit IV

1. a) Define function with an example program?

b) Brief about formal and actual arguments with an example program?

2. a) Demonstrate the various types of arguments in functions with a sample program?

b) In python functions are always called by passing reference, Justify.

3. a) Explain built-in functions with suitable example programs?

b) Define user defined function and list out the advantages of user defined functions?

4. a) Brief about local and global variable with an example program?

b) Define python Recursion function? Write a python program of factorial using recursion?

5. Write a Python function that takes two lists and returns True if they have at least one common member?
6. a) What are Anonymous functions in python?

b) Demonstrate the use of Lambda functions with a sample code.

7. Brief OOPs Concepts in detail?
8. Define inheritance and brief about different types of inheritances with an example.

Unit V

1. Define the error. Distinguish between Compile Time Errors, Run-time Error and Logical errors with an example program.
2. a) Why exception handling is more important in Python? Briefly explain try except-else-finally block?

b) Write a python program to handle the ZeroDivisonError exception.

3. Define Exception? List any 6 types of exception?

4. a) Define file and explain the two categories of files?

b) List out different types of file modes in python?

5. a) Write a short note on:

i) Advantages of storing data in a files **ii) Importance of closing file**

iii) seek () function **iv) tell () function**

6. a) What are the different ways of creating a new file and writing data into a file by giving an example programin Python?

b) Write a Python program to know whether a file exists or not, if it is existed display the content of a file withan example programs.

Note:

For concept wise example program please refer lab manual.....

There you can take example programs.