Assignment Problems
ST-205: Python Programming

---

1. Explain various types of operators used in Python.
2. Explain data values and data types supported in Python.
3. Explain Various String functions used in python.
4. Explain Interpreter and Interactive mode in Python.
5. Explain about various statements in python.
6. Explain the concept of Linear and Binary Search with Python program.
7. Define Boolean datatype?
8. Write the syntax for ternary operator in python.
9. Write the scope of the variable.
10. Define strings and name some methods.
11. Write a program to display the fibonacci sequences up to n^{th} term where n is provided by the user.
12. Write a program to repeatedly check for the largest number until the user enters "done".
13. Write a program to find the sum of all Odd and Even numbers up to a number specified by the user.
14. Explain the need for `continue` and `break` statements. Write a program to check whether a number is prime or not. Prompt the user for input.
15. Write a program using functions to find the value of ${}^{n}P_{r}$ and ${}^{n}C_{r}$ without using inbuilt `factorial()` function.
16. Write a program to print the sum of the following series $1+\frac{1}{2}+\cdots+\frac{1}{n}$
17. What is the difference between list and tuples in Python?
18. How does break, continue and pass work?
19. What is a dictionary in Python?
20. Discuss the following list functions: a) `len()` b) `sum()` c) `any()` d) `all()` e) `sorted()`

21. Explain the following list methods with an example. a) `append()` b)`extend()` c) `insert()` d) `index()` e) `sort()`

22. Write Python program to check if the items in the list are sorted in ascending or descending order and print suitable messages accordingly. Otherwise, print "Items in list are not sorted"

23. Write Python program to sort words in a sentence in decreasing order of their length. Display the sorted words along with their length.

24. Write a function which receives a variable number of strings as arguments. Find unique characters in each string.

25. Write Pythonic code to create a function called most_frequent that takes a string and prints the letters in decreasing order of frequency. Use dictionaries.

26. Illustrate the different types of control flow statements available in Python with flowcharts.

27. Explain the following:

    a) List Slicing and List Mutability.

    b) List Accessing Methods and List Comprehension.

28. Explain Selection and Insertion sort methods with python program.

29. Explain Merge and Quick sort methods with python program.

30. Explain Dictionary Operation and Methods.

31. Write code snippets in Python to perform the following: Accessing, Modifying and Deleting Elements of a Tuple

32. What are the conditional statements used in python?

33. Define if $\cdots$ else statements in python.

34. Define chained conditionals.

35. What are the different iterative statements?

36. Define range() function and its syntax.

37. Define while loop.

38. Write the syntax for nested for loops and nested while loop statements.

39. What is python break statement?

40. What is python continue statement.
41. Explain in detail about Control flow structures.
42. Write a program using while loop first N numbers divisible by 5.
43. List some of the methods in List Operations.
44. List out the types of Modules and Explain any two types in detail.
45. Write Python program to replace comma-separated words with hyphens and print hyphen-separated words in ascending order.
46. Write Pythonic code to multiply two matrices using nested loops and also perform transpose of the resultant matrix using class.
47. Program to demonstrate the Overriding of the Base Class method in the Derived Class.
48. Write Python program to demonstrate Multiple Inheritance.
49. What are the different function prototypes? Explain it with suitable example.
50. Write a program to circulate value of N numbers.
51. Write a program to compute the factorial of a given number using recursion.
52. Discuss Function arguments in Python.
53. What are the types of parameters in functions?
54. What are the various parameter passing techniques?
55. What is recursive function and its limitations?
56. Write the merits of using functions in a program.
57. Write a function called `describe_city()` that accepts the name of a city and its country. The function should print a sentence, like "Mumbai is in India". Give the parameter for the country a default value. Call your function for three different cities, at least a of which is not in the default country.
58. Write a function that accepts a list of items a person wants on a sandwich. The function should have a parameter that collects as many items as the function call provides, and it should print a summary of the sandwich that is being ordered. Call the function three times, using a different number of arguments each time.

59. Write a function that stores information about a car in a dictionary. The function should always receive a manufacturer and a model name. It should then accept an arbitrary number of keyword arguments. Call the function with two optional features like color and tow package.
`make_car('subaru','outback',color='blue',tow_package=True)`
Print the dictionary that's returned to make sure all the information was stored correctly.

60. What is a lambda function?

61. How will you create a Package and import it? Explain it with an example program.

62. Explain the concept of Exception Handling in Python with suitable program.

63. List the different ways to read a file. What the difference is between append and write mode?

64. Write a program to count the number of words in a text file.

65. Consider a File Called "workfile". Write Python Program to Read and Print Each Byte in the Binary File.

66. Write few NumPy package commands useful for linear algebra with examples.

67. Explain different ways to create an empty NumPy array in Python.

68. Write few SciPy package commands useful for statistical tests with examples.

69. Write few SciPy package commands useful for statistical distribution with examples.

70. What is tkinter?

71. Write the difference between Python Modules and Packages.

72. Write a python code for the developing graphical user interface for calculation sum of two given numbers.

73. Write a Python GUI program to create a window and disable to resize the window using tkinter module.

74. Write a Python GUI program to create three radio buttons widgets using tkinter module.

75. Write the syntax for composition.

76. State the differences between linear search and Binary search.

77. You work for a manufacturer, and have been asked to calculate the total profit made on the sales of a product. You are given a dictionary containing the cost price per unit (in dollars), sell price per unit (in dollars), and the starting inventory. Return the total profit made, rounded to the nearest dollar. Assume all of the inventory has been sold.

78. Create a function that takes two numbers as arguments (num, length) and returns a list of multiples of num up to length.

79. Given two lines, write a Python function to determine whether or not they are parallel. Lines are represented by a list [a, b, c], which corresponds to the line ax+by=c.

80. Create methods for the Calculator class that can do the following: Add, Subtract, Multiply and Divide two numbers.

81. Create a function that takes a list and returns a new list containing only prime numbers.

82. Create a function that takes numbers as arguments, adds them together, and returns the product of digits until the answer is only 1 digit long.

83. Write a program which will find all such numbers which are divisible by 7 but are not a multiple of 5, between 2000 and 3200 (both included).

84. Define a function which can generate a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys. The function should just print the values only.

85. Define a class Person and its two child classes: Male and Female. All classes have a method "getGender" which can print "Male" for Male class and "Female" for Female class.

86. Write a Python class to convert an integer to a roman numeral.

87. Write a Python class named Rectangle constructed by a length and width and a method which will compute the area of a rectangle.

88. Write a python code for the developing graphical user interface for adding, subtracting, dividing and multiplying two given numbers.

89. How to add a border (filled with 0's) around an existing two dimensional array?

90. Create a function that takes an integer and outputs an $n \times n$ square solely consisting of the integer n.

91. How to add a row at top in pandas DataFrame? What is Forward and backward filing of mising values of DataFrame columns in Pandas?
92. What Advantages Do Numpy Arrays Offer Over (nested) Python Lists?
93. Explain all file processing modes supported in Python.
94. Write few NumPy package commands useful for linear algebra with examples.
95. Explain different ways to create an empty NumPy array in Python.
96. Write few SciPy package commands useful for statistical parametric and non-parametric tests with proper syntax.