Scientific Computing – Lab Assignment-4

Python Programming - Functions

Write a Python program to create a function:

1. That accepts a string and returns the reverse of the string. (Don't use reverse function)

2. That accepts a list and returns the largest and smallest element in the list.

3. To calculate the factorial of a number (a non-negative integer). Pass the integer as an argument and return the factorial.

4. That accepts a string and calculate the number of upper case letters and lower case letters.

5. That takes a list and returns a new list with unique elements of the first list.

6. That returns a list of all four-digit numbers that have all their digits even and are perfect squares. (for eg:-, the output should include 6400 but not 8100 (one digit is odd) or 4248 (not a perfect square))

7. That accept an integer number, find if it is Disarium number or not (Hint: A number is said to be a Disarium number when the sum of its digit raised to the power of their respective position is equal to the number itself. Eg: 175 is a Disarium number, $1^1 + 7^2 + 5^3 = 175$)

8. That returns a list of all the Disarium numbers between two limits. The function accepts limits as the parameters.

9. That accepts a string, check for Palindrome and returns True or False respectively.

10. That accept an arbitrary number of words returns the count of each word.

11. That accept two lists and return True if they have at least one common item else return False.

12. That accept two numbers and return the GCD (greatest common divisor) of the numbers.

13. That accepts an arbitrary number of keyword arguments and returns the maximum value.

14. That accepts a string and return a list of all duplicate characters in the string.

15. That accepts a number, find the factors and return two lists. The first list contains all the odd factors and second list all the even ones.

Write a Python program to create a recursive function:

16. That accepts a number and find the harmonic sum of that number. (Hint: the harmonic sum of n is equal to the sum of reciprocals of positive integers up to n). For example, if n =3, HS = 1+1/2+1/3

17. That accepts a number and find the sum of geometric series of that number. (Hint: Geometric series of 4 = 1+1/2+1/4+1/8)

18. That accepts two integers and find the gcd (greatest common divisor) of them.

19. That accepts a decimal integer and display its binary equivalent.

20. To find an item in a sorted list using binary search.