Python Programming (CS0452)

Tutorial Exercises for Unit 2

Practice Numeric data type operations and functions

Practice String-related operations and methods

I. Check for Palindrome

II. Check if given 2 strings are anagrams

[Two strings are anagrams if they are written using the same letters (ignoring spaces, punctuations and cases). eg: Mary and Army are anagrams]

III. Print all the permutations of a given string.

eg: Input: 'xyz'

Output: 'xyz', 'xzy', 'yxz', 'yzx', 'zxy', 'zyx'

IV. Encryption (plain text to cypher text)

Write a function called rotate_word that takes a string and an integer as parameters, and that returns a new string that contains the letters from the original string “rotated” by the given amount.

[Hint: You might want to use the built-in functions ‘ord’, which converts a character to a numeric code, and ‘chr’, which converts numeric codes to characters.]

Practice Lists-related operations and methods

V. Write a function that takes a list of numbers and returns the cumulative sum, i.e., a new list where the 'i'th element is the sum of the first 'i+1' elements from the original list.
eg: the cumulative sum of [1, 2, 3, 4] is [1, 3, 6, 10]

VI. Write a program to implement FIFO (queue).

VII. Write a program to implement LIFO (stack).

VIII (a). Given an input text file (intro.txt), count the number of words in the file. Display the list of words and the total count.

VIII (b). Given an input text file, store all the words in the text file into a list. Remove duplications! Display the list of words.

*VIII (c). Given an input text file, store all the words into a list, count the number of occurance of each word. Display the top 10 most 'popular' words.

* Not mandatory, only a challenge!!

IX. Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.

[eg: is_sorted([1, 2]) should return True and is_sorted(['c', 'a']) should return False.

Hint: Use relational operators to compare elements in the list.]

X. (a) Write a function 'bisect' that takes a sorted list and a target value and returns the index of the value in the list, if it's there, or None if it's not. [Implement binary search.]

X. (b) Display the time taken for searching along with the size of the sorted list.

[Hint: Use 'random' and 'time' modules.]

XI. Write a function that reads the file 'words.txt' and builds a list with one element per word. Write two versions of this function, one using the 'append()' method and the other using the idiom t = t + [x]. Which one takes longer to run? Why?

[Hint: use the 'time' module to measure elapsed time.]