CS2613: Programming Languages Laboratory (FR02A)
Lab #6 – Winter 2024

Language: Python (#2)
# of Tasks: 3
Topics:

- Strings
- Lists
- File I/O

*All tasks are to be completed individually in line with the academic offense guidelines detailed on the syllabus and are **due before the end of the lab period** unless stated otherwise.*

Task #1

Task Style: Research
Submission Method: D2L Dropbox

Description:
In your own words, describe the main differences between a list (in Python) and an array (in Java)? How are they similar? How do you create and add to a list? Provide examples of the code where appropriate. I recommend you read about lists in the Think Python 2e textbook rather than simply copying and pasting the questions above into a web search.

Submit a single page PDF to the D2L Dropbox labelled “L6_T1” before the end of the lab period. The PDF does not need to be a full page in length but should answer the questions above.

Resources:

- Think Python 2e Chapter(s):
    - 10

Task #2

Task Style: Programming
Submission Method: Move onto Task #3

Description:
Create the following functions. Once completed, write a basic "driver" that tests each function by calling the function at least twice each and prints the returned values to the terminal.

Only Words of a Given Length:

Parameter(s): (1) a string representing a sentence with each "word" separated by a space and (2) an integer representing a word length.
Returns: A list of "words" from sentence that have the same length as the integer passed in as a parameter. You may treat that any punctuation or special characters as a character in the "word".

Example:

given_length("The white cat and the red fox.", 3) = ["The", "cat", "and", "the", "red"]

Longest Words:

Parameter(s): A string representing a sentence with each "word" separated by a space.
Returns: The longest "word" or "words" from sentence in a list. You may treat that any punctuation or special characters as a character in the "word". If there is more than one longest "word", return a list of all the longest "words".

Examples:

longest_word("Hello CS2613! Python is fun.") = ["CS2613!"]
longest_word("Hello CS2613 - Python is fun.") = ["CS2613", "Python"]

Most Common Letter:

Parameter(s): A string representing a sentence.
Returns: The most common letter(s) (a-z) in the sentence in lower case in a list. This is case insensitive meaning 'a' == 'A'. Do not consider non-letter characters as letters.

Hint: To create a list of values of a certain length more efficiently, you can multiple the length by a list of only 1 value, i.e., [0] * 26.

Examples:

most_common("My name is…") = ['m']
most_common ("This is!") = ['i', 's']

Resources:

- Think Python 2e Chapter(s):
  - 8
  - 10 – specifically look at 10.9
  - Research ord() and chr() functions

Task #3

Task Style: Programming
Submission Method: Show to the Instructor or Teaching Assistant (before the end of the lab period).

Description:

On D2L, you can find the file labelled “L6_T3_Text.txt” that contains an excerpt from a book on multiple lines. Add to your Python program from Task 3 to open this file, read in all lines into a single String, and print the answer to the following 3 questions:

1. How many words in the document are 5 letter words?
2. What is the most common letter?
3. What are the longest words?

Resources:

- Think Python 2e Chapter(s):
  - 14
- https://www.w3schools.com/python/python_file_open.asp