CS2613: Programming Languages Laboratory (FR02A)
Lab #12 – Winter 2024

Language: Python (#3)
# of Tasks: 3
Topics:
- Lambda Functions
- Mapping and Filtering

*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: Programming (in Partners)
Submission Method: Mutual Agreement

Description:
In this lab, you will be performing functional programming which is a paradigm of programming.

Select a partner to complete task 1 with. Both students should have an answer to Task #1 on their own computer and they should understand what all parts of their code does. To "submit" this task, partners must both understand their solution and agree that their solution works.

In lambda notation, write functions for each of the listed requirements (one per each question). After completing the function, call the function and print the result on at least 1 test case.

1. The function should take a single value and return the value multiplied by 2.

2. The function should take a string and return the character in the centre of the string.
    In other words, if the string is of length 9, return the 4th and if the string is of length 12, return the 6th character. Not necessary but may be helpful to research rounding in Python.

3. The function should take a single value and return true if the value is odd and positive and will return false otherwise.

4.   This function should take a string and return true if the string starts with a vowel character: A, E, I, O, or U. The functions returns false otherwise.

Resources:
*   https://realpython.com/python-functional-programming/

Task #2

Task Style: Programming (Solo)
Submission Method: Raise hand to show completed task to Professor or Teaching Assistant.

Description:

Write a lambda function that takes two values and returns the higher of the two values. If the values are equal, just return the value. Call the function with two values and print the result in at least 2 appropriate test cases.

You will need to familiarize yourself with single-line if-else statements to complete this task.

Resources:

- https://learnpython.com/blog/python-if-in-one-line/

Task #3

Task Style: Programming
Submission Method: Self-Assessment on D2L

Description:

Here you will gain familiarity with mapping and filtering in Python. Start by reading over what mapping and filtering is in the webpage shared for Task #1.

Using the mapping function and the functions you have created for Task #1:

1. Print the following list of values multiplied by 2:
   [8,10,7.5]

2. Print the middle character for each string in the following list:
   ["Hello!", "CompSci2613", "Lab-12"]

3. Print only the elements of the list that are positive odd values:
   [-15, -4, 0, 4, 23, 64, 101, 104, 123]

4. Print only the elements of the list that start with vowels:
   ["alice", "bob", "Carl", "daisy", "Earl"]

Resources:

- https://www.geeksforgeeks.org/python-map-function/