CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

Systems Scripting

Semester 2, 2018

Assignment 2: Python Scripts

Submission Deadline: Monday 7th May 2018 Midnight

For each task write a short report describing your solution concept and how you arrived at it. This should be done as a block comment on top of each task solution script.
Note: The use of existing Python functions or methods outside those used in the class or lab materials is forbidden. You are required to write your own functions. Not adhering to this will result to heavy **penalties**.

Task 1

Write three Python functions that accept a list as parameter. The first function should return the largest value in the list. The second function should return the smallest value in the list. The third function should replicate the list by 3, output the new length of the list and also output, using a loop, the odd numbers in the list.

In the main program, interactively create a list of 12 numbers. Present a user with a set of menu to select from. If a user enters the character 'B' or 'b', the program should output the largest number in the list. When a user enters the character 'S' or 's', the program should output the smallest number in the list. When a user enters any number, the program should perform the replication, outputting of length and all odd numbers in the list. When a user enters 'E' or 'e', the program should terminate with a goodbye message. **[10 marks]**

Task 2

Write a function named *reducer()* that accepts an integer parameter named *number*. If *number* is even then *reducer()* should divide *number* by 2 and return this value. If *number* is odd, then reducer should return 3 times *number* + 1.

Then write a program that requires a user to enter an integer number and that keeps calling *reducer()* on that number until the function returns the value 1. (Amazingly, this sequence works for any integer value. Sooner or later you will arrive at value 1). Example output sequence for entering the number 3 is:

10
5
16
8
4
2
1 **[7 marks]**

Task 3

Write a Python function that accepts two parameters. The first parameter should be a list and the second parameter should be a number. Use a random generator to generate indexes in the range of 2 to 5 based on the second parameter and then randomly remove from the list the items that corresponds to those indexes. The function should return the remaining items as a tuple.

Interactively create a list of words or numbers that has at least 12 items and request a user to enter a number between 2 and 9. Invoke your function with the appropriate parameters. Output per line, the returned tuple and the original lists.
Sample program output when 4 items were randomly deleted:
Output tuple: (4, 5, 3, 8, 9, 5, 3, 5, 9)
Original List: [4, 5, 6, 3, 2, 8, 9, 3, 5, 4, 3, 5, 9]

[10 marks]

Task 4

Write a Python function that accepts three parameters. The first parameter should be a sentence, the second parameter should be a word and the third parameter is another word. The function should search the string for the first word and replace it with the second word.

Then write a Python script that demands a user to input a sentence, a word that occurred in the sentence and a replacement word for it. Call your function with these input values. Output the original sentence and the resulting changed sentence. **Never use the replace() string method for this task!!**
Sample Inputs:
Sentence: “How are you doing?”
Word1: “you”
Word2: “we”
Output sample:
Original sentence: How are you doing?
Changed sentence: How are we doing?

[8 marks]

Submission Instruction:

Each task should be solved with a different script file. Put the solution scripts into a folder and name the folder as follows: **firstname-surname**. Create a Zip archive from the folder. It should have the name: **firstname-surname.zip** E.g., Vincent-Emeakaroha.zip. Upload this archive to Blackboard.