DS Core-1 Fundamentals of DS

Assignment No. 1

September 13, 2021

Deadline: September 17, 2021

Attention

- Make sure that you read and understand each and every instruction. If you have any questions or comments you are encouraged to discuss with your colleagues and instructors on Google classroom.
- Create each problem solution in a separate .py/ file, i.e. you must name the file containing solution of Q1 as'q1.py'.
  - ❖ Combine all your work in one .zip file.
  - ❖ Name the .zip file as ROLL-NUM SECTION.zip (e.g. 20i-0001 B.zip).
  - ❖ Submit the .zip file on Google Classroom within the deadline.
- Moreover, you also have to submit a Jupyter Notebook with output displayed in the cells.
- Start early otherwise you will struggle with the assignment.
- You must follow the submission instructions to the letter, as failing to do so will get you a zero in the assignment.
- All the submitted evaluation instruments (quizzes, assignments, lab work, exams, and the project) will be checked for plagiarism. If found plagiarized, both the involved parties will be awarded zero marks in the relevant evaluation instrument, all of the instruments or even an F grade in the course. (Copying from internet will be considered as plagiarism)

Objective

- Learning basic functions and structures of python

Overview

Q1 Write a function which takes a string as input and it returns the shortest word in the string and its length (the shortest word should be of more than 1 character and use of built in string and list functions are not allowed).

Example:

Input:

"This is a very long sentence boy."

Output:

"'is', 2"

Q2 Write a function which takes a string as input and it analyzes the string completely. It should give the number of sentences, words, alphabets, digits, spaces and other characters (as 'others') as output.

Example:
Input:
      "I'm 20 years old now. I will be 21 next year."
Output
      Sentences: 2
      Words: 9
      Alphabets: 28
      Digits: 4
      Spaces: 10
      Others: 3

Q3 Write a Python function that receives a string consisting of several lines of text and returns an array indicating
the number of one-letter words, two-letter words, three-letter words, and so on, appearing in the text.
Example:
Input:
      "Authenticity is an act of social justice"

Output:
      The string contains 3 one-letter, 1 three-letter, 1 six-letter and 2 more-than-six-letter words.

Q4 Write a Python function that takes 4 integer lists as input and prints all the common elements in them.
Example:
Input:
      list1: 1 3 5 7 9 11
      list2: 5 8 14 17 18 19
      list3: 9 7 12 13 15
      list4: 4 9 11 13 17

Output:
      Common elements: 5, 7, 9, 11, 13, 17

Q5 Write a Python function that matches the key and values.
Example:
Input:
      d1 = {'k1': 1, 'k2': 3, 'k3': 2, 'k4':3}
      d2 = {'k1': 1, 'k2': 2, 'k3': 2}

Output:
      k1: 1, k3: 2 is present in both dictionaries d1 and d

Q6 Write a program that tells you the frequency of each number/word in the input. (Result should be alphanumerically sorted)

Example:

Input: I love python but I am confused whether to select python 2 or python3.

Output: 2: 1

      am: 1

      but: 1

      confused: 1

      I: 2

      love: 1

      or: 1

      python: 2

      python3.:1

      select: 1

      to: 1

      whether:

Grading policy:

The program must work. Any compilation errors would result in zero marks. Please refrain from submitting code with compile time errors.