Homework 3

100 points

Due date: 2/21/2020 - 11:59 pm

Deliverable: Submit a Python file (.py) for each question. Name the files as hwX-qY.py where X is the homework number and Y is the question number. For example, for the first question your file name should be hw3-q1.py. Follow the exact naming policy. Otherwise, you get zero. Your TA uses scripts and test cases to automate grading your codes. Wrong naming will interrupt this process.

Rubric:

1- Do not solve questions using topics which have not been covered in the class.

2- You get no points If the TA cannot run your code. This may happen because of a syntax error, wrong file name, or incorrect algorithm.

3- Your code must generate correct output similar to the examples right after each question (The TA tests your code with a few test cases).

1- **(25 points)** Write a Python script that iterates over all the pairs in the following dictionary and prints out the pair whose value (here, values are lists) has the maximum number of even numbers. The script prints out the pair followed by the count of even numbers in that its list.

For example:

d = {"l1":[2,4,6,8],

    "l2":[0,-2,1,11,3],

    "l3":[17,15,12,100,122]}

  'l1':[2,4,6,8] ----> 4

2- **(25 points)** Write a Python script that gets a sentence from user. It then iterates over the words in the sentence **<u>just once</u>** and returns a dictionary which shows how many words in the sentence start with each vowel. (Lower or upper case does not matter. Besides, consider the subject 'I' and the article 'a' as words not letters)

For example:

Please enter a sentence:

The ultimate measure of a man is not where he stands in moments of comfort and convenience, but where he stands at times of challenge and controversy.

result = {'a': 4, 'o': 3, 'u': 1, 'i': 2, 'e': 0}

3- **(50 point)** Write a python script that gets a sequence of space separated integers as a list. It then gets a desired integer from user. The script needs to return indices of all two list members whose sum are equal to the user's desired integer (if there is any – **duplicate indices should not appear in the output**).

Note that you can use nested loops to iterate over the list elements and solve this question. However, such a solution is computationally very expensive. To have a solution with a reasonable computation cost, **you have to use Python dictionary in your solution. You get no credit for solving this question without a Python Dictionary.**

For Example:

enter the elements of a list

1 2 3 4 5 6 7 8

enter your desired integer

9

0 7

1 6

2 5

3 4

This means that elements with the indices of 0 and 7 (I.e. 1 and 8 in the list), 1 and 6 (I.e. 2 and 7 in the list), 2 and 5 (I.e. 3 and 6 in the list), and 3 and 4 (I.e. 4 and 5 in the list) add up to the desired integer which is 9.

Another example would be:

enter the elements of a list

0 -2 11 13 14 102 78 2 82 80

enter your desired integer

80

0 9

1 8

6 7