Homework 4

Version 0.1

COS125 - Instructor: Zachary Hutchinson

Due: Friday October 13th @12AM (midnight)

Submission Instructions

These must be followed or you will lose points.

1. Submit your coded solution as a .py file. Code in any other file format will be rejected.
2. Your .py file should be named: yourlastname_hwX.py. The 'X' in the filename is replaced by the homework number.
3. Your code must have as a comment at the top of the file: your name, the homework and the names of anyone from whom you received help. This includes students in the course as well as course staff. For example, if you went to Boardman 138 and received help from an MLA, put their name on your file. If a classmate helped you debug a bit of code, put their name down. This is for your benefit.
4. If you do not manage to squash all the bugs in your program, include a comment at the top of the file detailing the outstanding bugs. Acknowledging bugs is a sign of a mature programmer. Doing so will not eliminate point deductions but it might mitigate them. It shows you care about your work.

Learning Objectives

- Understand how to manipulate large amounts of data using Python.
- Practice using lists and dictionaries.
- Understand the difficult in maintaining associations between data points.

Code Tools Tested by This Homework

- lists
- dictionaries
- loops
- built-in functions: sum(), len(), max() and min().

Problem Description

One of the most common uses of the Python language is processing data. For this homework you will write a Python program that reads through and analyzes a sizable list of information.

A starter homework 4 Python file has been provided for you that contains a list called *data*. You MUST use this file to start your homework. Do not modify the list contents. Write your code where indicated.

Background

You have a friend in the lobster industry who needs your help. She has come to you with 1,000 sample lobster weights taken from different locations off the coast of Maine. The lobster data consists of a location

tag and a weight. There are six different locations. In the data, locations are designated by a single character a-to-f. All weights are rounded to 1 decimal point.

She wants to know several things about the data.

1. She wants to know the number of samples at each location.
2. She wants to know the average size (i.e. weight) of the samples taken at each location.
3. Averages should be truncated to 2 decimal places.
4. She wants to know the minimum and maximum size taken at each location.
5. She wants the output in a table format with locations ranked by average size.

Example

```
[zax@foley hw4]$ python3 hw4_example.py
LOCATION   NUMBER     AVG SIZE   MIN SIZE   MAX SIZE
b          181        2.56       1.9        3.2
f          160        2.31       1.0        3.7
d          150        2.20       1.1        3.4
e          180        2.06       1.4        2.7
c          163        1.56       1.0        2.1
a          166        1.40       1.1        1.7
```

Hints

- Make use of dictionaries and lists to sort the data by location
- Examine the structure of the list.
- Before starting, think carefully about how you will maintain the relationship between lobster sizes and their locations.

Disclaimer

Lobster weights are made up.