Spring 2019
Computer Science I — Maíra Marques Samary PhD
Section 4 – TU-TH – 9:00AM – Fulton 250
Section 5 – TU-TH - 10:30AM – Fulton 250
Office Hours Monday and-Friday -10:00AM – 12:00AM
St Mary - CS Department – Of. 281.

TA's Office Hours – all at Fulton 160
Molly Soja (sojam@bc.edu) - M 2PM-3PM
Yicheng Shen – Mark (shenvw@bc.edu) - TH 3PM-4PM
Anna Peterson (peterspm@bc.edu) - SU NOON-1PM
Luke Ruter (ruterl@bc.edu) - SA 2PM-3PM

Assignment 7

Due date – 05/02/19 11:59 PM

General Instructions

Create a folder named ***HW7_LASTNAME_FIRSTNAME***. You will populate the folder with **ALL** of the .py files you write for this homework. To submit the homework, verify the folder includes all your .py files, compress (zip) the folder then upload to Canvas. Remember to include the following comments at the **top of each** of your .py files:

```
# author:
# assignment:
# description:
```

What to submit in Canvas?

Make sure all your files are saved in the folder HW7_LASTNAME_FIRSTNAME, then compress (zip) the folder and upload to Canvas.

If you encounter any problems in completing the assignment or in the submission process, please don't hesitate to ask for help. The sooner, the better!

IMPORTANT

Now that you are already familiar with functions, almost all your code must be inside functions! Points will be taken if you put too many line of codes outside functions.

Don’t forget, if your code **does not run** and shows errors when we try to evaluate and correct, you will have an **automatic 0. No arguing, no complaints!!!**

In this assignment, you must read some data from a file, create a dictionary and to create some graphs that will allow analyzing the behavior of the data of earthquakes.

A file called earthquake.txt is compressed with these instructions, which contains some data related to earthquakes.

Each row of the data file has the following 7 data:

- Measure: Measurement of earthquake level on the Richter scale.
- Date: date of the earthquake, format year / month / day; year with 4 digits.
- Time: Earthquake time, format HH: MM: SS.
- Latitude: Latitude of the earthquake location.
- Longitude: Length of earthquake location.
- Depth: Depth of earthquake location.
- Where: Country or region where the earthquake occurred (here region or location is a string, it has " " spaces as a separator of them, as well as semi-colon (;) and coma (,) inside the string.

Upload data to dictionary
In this section, for each line of the file earthquake.txt, an element must be created in the dictionary, where the location is the key of the dictionary.

Correctly loading the file to the dictionary is mandatory, otherwise it will be tough to create the graphics requested.

Example (partial):


```
{'CENTRAL ALASKA': [[2.8, '2006/10/19', '02:02:10', '62.391', '-
149.751', '15.0'], [3.7, '2006/10/18', '05:34:15', '62.326', '-
151.224', '85.9'], [4.9, '2006/10/17', '14:37:53', '63.103', '-
150.591', '100.8'], [2.9, '2006/10/15', '23:58:05', '62.539', '-
151.548', '100.0'], [2.5, '2006/10/13', '10:03:28', '63.211', '-
144.896', '1.0'], [2.7, '2006/10/13', '09:13:37', '62.711', '-
143.669', '1.0'], [2.6, '2006/10/13', '08:47:39', '63.149', '-
144.574', '10.0'], [2.6, '2006/10/12', '15:23:07', '62.931', '-
150.579', '100.0']], 'MAUI REGION, HAWAII': [[2.5, '2006/10/19',
'00:31:15', '20.119', '-156.213', '1.5'], [3.1, '2006/10/18',
'16:40:15', '20.282', '-156.611', '4.7'], [3.2, '2006/10/17',
'06:20:33', '20.090', '-156.158', '11.6'], [2.8, '2006/10/17',
'05:18:04', '35.230', '-92.290', '3.8'], [3.7, '2006/10/16',
'11:15:58', '20.800', '-156.939', '7.2'], [2.7, '2006/10/15',
'21:30:25', '20.625', '-156.681', '7.0'], [4.4, '2006/10/15',
```

'20:35:21', '20.130', '-156.025', '24.9'], [2.7, '2006/10/15',
'20:20:27', '20.834', '-156.643', '5.4'], [3.1, '2006/10/15',
'19:29:54', '20.612', '-156.248', '7.0'], [2.5, '2006/10/15',
'18:45:06', '20.744', '-156.356', '7.0'], [3.1, '2006/10/15',
'17:45:43', '20.879', '-156.894', '7.0']], 'SOUTH OF PANAMA':
[[5.0, '2006/10/18', '21:15:51', '4.823', '-82.592', '37.3']],
'GULF OF ALASKA': [[2.6, '2006/10/18', '21:12:25', '59.934', '-
147.904', '30.0']], 'SOUTHEASTERN MISSOURI': [[3.4,
'2006/10/18', '20:59:21', '36.540', '-89.640', '7.7']],

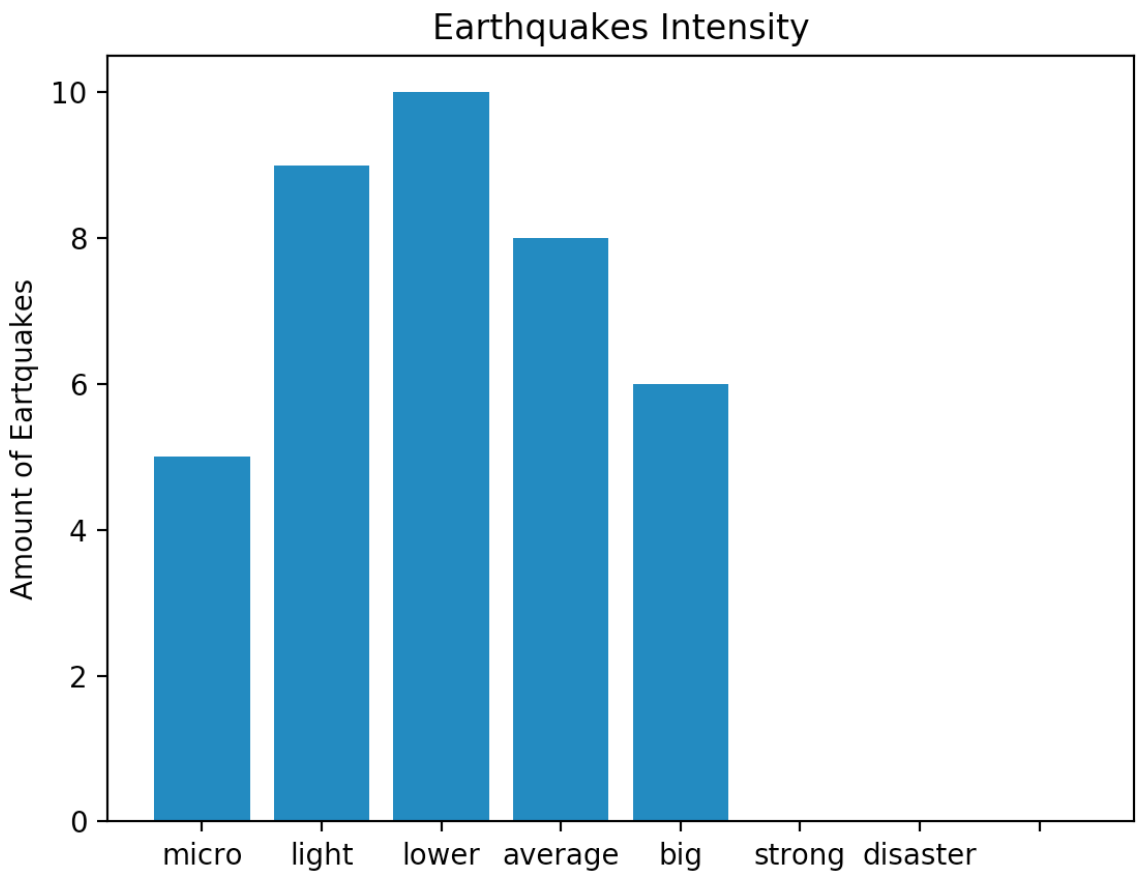
....

Graph 1 - Bar chart with number of earthquakes

A function should be created that generates the bar graph with the number of earthquakes according to the following classification:

- micro - if the intensity of the earthquake was less than 3
- light - if the earthquake intensity was less than or equal to 3.9 and greater than 3
- lower - if the earthquake intensity was less than or equal to 4.9 and greater than 4
- average - if the earthquake intensity was less than or equal to 5.9 and greater than 5
- big - if the earthquake intensity was less than or equal to 6.9 and greater than 6
- strong - if the earthquake intensity was less than or equal to 7.9 and greater than 7
- disaster - if the earthquake intensity was greater than 8

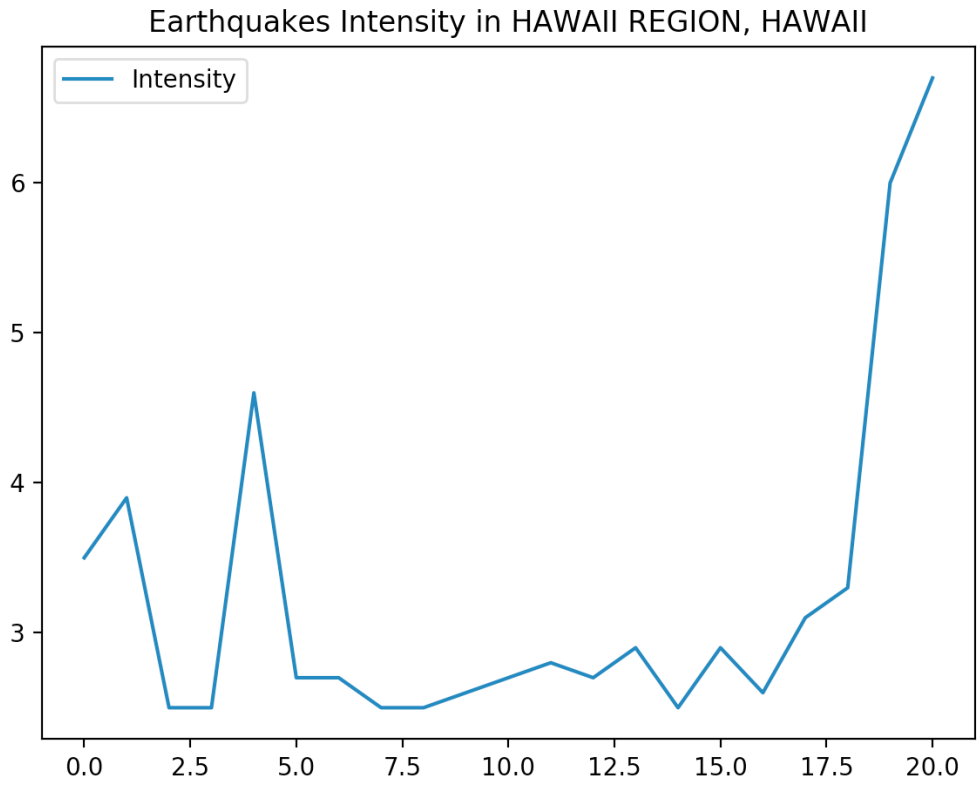
Example:



Graph 2 - Line chart of earthquakes occurring in Hawaii.

You must create a function that first selects all the data that reports the earthquakes that occurred in the "HAWAII REGION, HAWAII" and with that data create a graph of intensity lines (measure-first dictionary item).

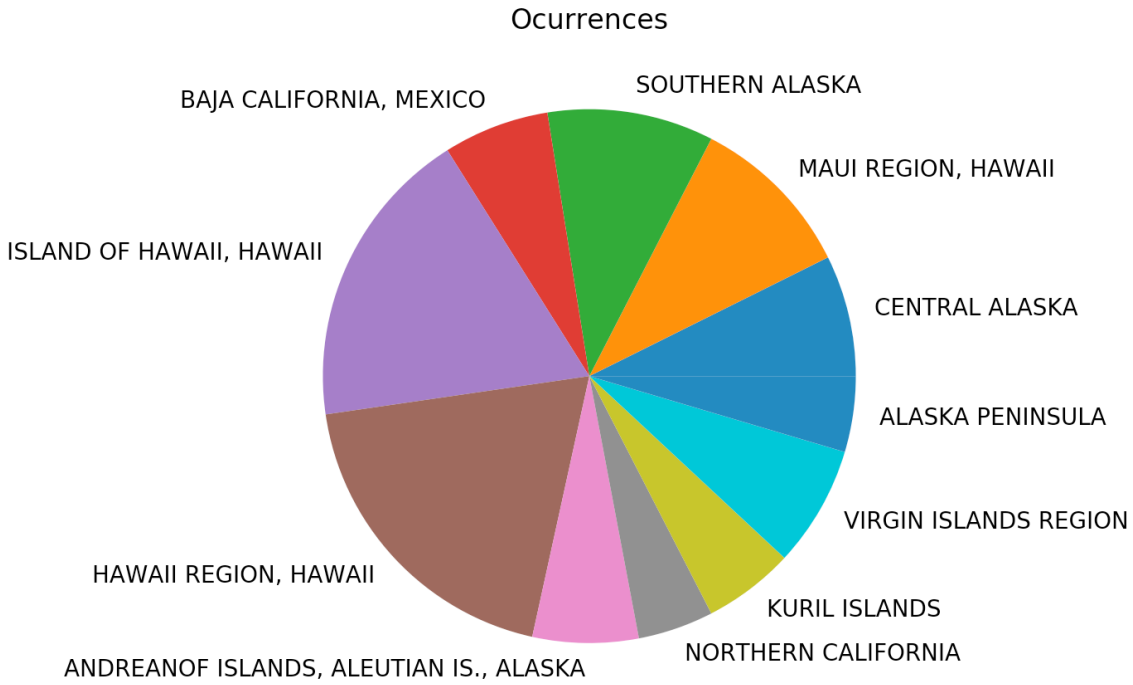
Example:



Graph 3 – Pie Chart of the locations that had more than 4 (not equal to 4) occurrences of earthquakes.

You must create a function that first counts the earthquakes reported per location. Consider the locations that had more than four earthquakes and create a pie char.

Example:



Function Strongest:

Create a function that reads the dictionary and prints where it was and what is the magnitude of the strongest earthquake in the file.

```
The strongest earthquake was in  HAWAII REGION, HAWAII
6.7  of magnitude
```

RUBRIC

1. Dictionary correctly implemented – **2 points**
2. Graph 1.– **2 points**
3. Graph 2 – **2.5 points**
4. Graph 3 – **2.5 points**
5 Strongest function – **2 points**