420-LCU-05 Programming in Python - Assignment 3
Due Apr 18, 2024 at 11:59 p.m.

1- **Identification section**: This section must be either in a comment, with a '#' preceding each line, or enclosed within triple quotes ('''). The grader and I need this section for the accurate processing of your assignment. Assignments missing this may lose up to 5% of the mark.

"""

Your Name and ID

420-LCU Computer Programming, Section #

S. Hilal, instructor

Assignment 3

"""

2- **Submission**: Submit your assignment in 1 Python file, with the extension .py. **Do not submit a .zip file or include data file.** Be sure to respect other instructions specified in the assignment. An important part of each assignment is to correctly follow the instructions closely. **Late assignments** are accepted up to 1 week from deadline. But late penalty applies.

Learning Objectives:

- Practice using a dictionary as a lookup table for information.
- Practice with dictionary methods, strings, lists and for loops.
- Reading data from a File and structuring the data in a dictionary
- Use formatted-printing for an organized tabular display of information.
- Plotting simple data using matplotlib

Assignment Description:

The data file included with A3 (**NaturalDisasters.txt**) includes basic info on some of the major natural disasters that happened and were documented in the last 120 year.

You will read the data file and store the data in 2 dictionaries. The dictionaries created will be later used as lookup tables that can be used to create other smaller dictionaries and/or lists that can enable you to answer some basic data queries and statistical analysis.

Description of Data:

The text file "NaturalDisasters.txt " includes 90 records. Each record includes (in this order): disaster title (10-40 character), type (10-12 characters), and year. The first 2 record must be stored as strings while the third field as int.

You will start with 2 empty dictionaries

Types= {} # title (str), type (str) pairs

Years= {} # title (str), year (int) pairs

In a first pass and before any other logic, you will fill up both dictionaries with the data from the given file.

Here's an example of how it should look like for the first 3 records, needless to say that each of D1 and D2 will contain 90 items.

```
Types = {'Eastern United States heatwave': 'heatwave',
         'Eruption of Mount Pelee': 'volcano',
         'Kangra Earthquake': 'earthquake'}

Years = {'Eastern United States heatwave': 1901,
         'Eruption of Mount Pelee': 1902,
         'Kangra Earthquake': 1905}
```

Program Menu: should appear as is without Hint/clarification (shown in bold)
Program Menu:

1- How many records are there in the data file? Display all complete records in tabular format.
2- How many different types of natural disasters are reported? Print a numbered list of all types.
3- What type of Natural Disaster has been reported the most and how many times? (**Hint: create a new small dictionary to count how many of each type**)
4- What type of Natural Disaster has been reported the least and how many times?
5- Display all the titles of the natural disasters of a requested type. **(user enters a type & program prints title and year in tabular format)**
6- Display all the titles of the natural disasters of a requested year. **(user enters a year & program prints all titles)**
7- List all the years where 2 or more natural disasters were reported. **(show result as tabular year: number of disasters reported)**
8- List all types of natural disasters that have occurred more than 3 times.
9- List the top 5 types of natural disasters that were reported **(5 types of highest count from highest to lowest).**
10- Display a pie chart plot to show the distribution of titles among the top 8 types of natural disasters.
11- Exit

Do not include information in bold and between () on the menu.
Important Note: Before doing any of the options on the menu, you have to read the data from the file dictionaries as above. This is not part of the menu and has to be done as soon as the program starts.

Rubrique: A3 is graded on 40 and is worth 5% of final grade.
Reading Data File & creating dictionaries Types and Years: 5 points
Options 1-10: 3 points each
Option 11: 1 points
General code structure & comments: 4 points

Error Checking/validation:

1- No need to validate the data that you read from the file but you have to validate any data inputted from the menu options (i.e. option 5, 6).
2- **Formatted-Printing**: Use formatted-printing to display results **whenever your search gives a set of multiple items**.

Important Final Notes: There are 10 options but do not worry. The code for each option is short: 3-12 lines. Some of the options require the creation of a new small dictionary. Create these dictionaries before the menu while loop because they can be shared by more than 1 option (e.g. option 3 & 4 use the same dictionary. Do not repeat code.)