

PET5936 - Spring 2023

Assignment # 2

Please submit your assignment as a jupyter notebook (.ipynb file). Start a new jupyter notebook and name it "YourName_Assignment 2"

Replace *YourName* by your first name and last name

Description: This assignment will assess your ability to use loops and functions to solve programming challenges. Some of the points will also require to use list/dictionaries to successfully complete the task. Finally, the last point will help you to practice the concepts related to object oriented programming and developing simple user interfaces.

1. [2 points] Write a function with one input, the input should be a string variable. Words in the string variable are separated by ' '. Your function should count:
 - The number of words in the sentence
 - The number of characters in the sentence (without including ' ')
 - The number of instances that every letter of the alphabet appears in the sentence
1. [2 points] Write a function with one input, the input should be a string variable. Words in the string variable are separated by ' '. Your function should identify if there are numbers in the sentence. If there are numbers, then the function must return the sum.

Example:

```
- Input: 'There are 3 friends with me, 2 of us are older than 18'
- Output: 23

- Input: 'My online friend, XX_SAM2000_XX is turning 18 next week'
- Output: 2018
```

1. [2 points] Write a function with one input, the input should be a string representing a date using the following format: month (two digits)/ day (two digits) / year (four digits). The function should ensure that the inputs are valid, for example
 - 01/20/1985 -> valid input
 - 02/30/2022 -> not valid input (month 02 only has 28 or 29 days)
 - 15/12/2000 -> not valid input (month 15 is not valid)

Your function should return the number of days since the provided date until today.

Hints:

- You can find today's date using the following code:

```
from datetime import date
today = date.today().strftime("%m/%d/%y")
```

- A leap year is a year that is divisible by four.

1. [4 points] Load the provided *json* file into a variable using the following code

```
import json
f = open('countries-data.json')
data = json.load(f)
```

make sure that the file *countries-data.json* is in the same folder as your jupyter notebook. The variable `data` is a list of dictionaries, and each dictionary contains information about different countries in the world.

- a. How many different languages are the data. Print a list with the languages.
- b. Find the ten most spoken languages from the data. How many countries speak of language?
- c. What country or countries speaks the most languages. Identify the country or countries and the languages.
- d. Find the 10 most populated countries in the world.