CS 115 - Introduction to Programming in Python

Lab Guide 06

Lab Objectives: Classes

Notes:

1. Upload your solutions as **a single .zip file** to the Lab06 assignment for your section on Moodle. You must use the following naming convention: Lab06_Surname_FirstName.zip where Surname is your family name and FirstName is your first name.
2. You should only use functionality covered in CS115 in your solution.
3. Include a docstring for your functions.

1. Write a class called Nation (**Nation.py**) that represents a typical **Nation** object.

   The class will store the following attributes:

   - country
   - continent
   - life expectancy for men
   - life expectancy for women

   Note that all data attributes should be private (__).

   a. Your class should have an `init()` method that takes the values of all four attributes as parameters.

   b. Your class should have the following methods:
      - `get_country:`   returns the country
      - `get_continent:`   returns the continent
      - `get_life_men:`   returns the life expectancy for men
      - `get_life_women:`   returns the life expectancy for women

c. Write a method `calculate_average` which returns the average life expectancy of men and women.

d. Write the special method **__lt__** which will check the country names of two **Nation** objects and return either **True** or **False**.

e. Your class should define an **__str__** method and a **__repr__** method according to the output.

2. Create a Python script that does the following:

a. Implement the `read_file` method which receives the file name and returns a dictionary which contains the country names as keys and nation objects as the values. (First examine the data file format)

3. Write the global scope:
   a. Read the contents of the file `'country.txt'` into dictionary d using the above read_file function
   b. Input a <u>country name</u> and display its information.
   c. Input a <u>continent name</u> and put the nation objects in that continent into a list **selected**.
   d. Sort the **selected** list according to the country names.
   e. Display the sorted list.

Sample Run:

```
Enter a country: Turkey
Country:Turkey
Continent: Asia
Average Life Expectancy: 69.1


Enter a continent: Europe
Countries in Europe :
[Country:Bulgaria
Continent: Europe
Life Expectancy for Males: 67.8
Life Expectancy for Females: 74.9
, Country:Czech.Republic
Continent: Europe
Life Expectancy for Males: 69.8
Life Expectancy for Females: 72.3
, Country:Denmark
Continent: Europe
Life Expectancy for Males: 73.0
```

Life Expectancy for Females: 78.3
, Country:Finland
Continent: Europe
Life Expectancy for Males: 73.0
Life Expectancy for Females: 80.1
, Country:France
Continent: Europe
Life Expectancy for Males: 74.6
Life Expectancy for Females: 82.9
, Country:Germany
Continent: Europe
Life Expectancy for Males: 73.4
Life Expectancy for Females: 79.9
, Country:Greece
Continent: Europe
Life Expectancy for Males: 75.5
Life Expectancy for Females: 80.6
, Country:Hungary
Continent: Europe
Life Expectancy for Males: 64.5
Life Expectancy for Females: 73.8
, Country:Iceland
Continent: Europe
Life Expectancy for Males: 77.4
Life Expectancy for Females: 81.2
, Country:Ireland
Continent: Europe
Life Expectancy for Males: 74.0
Life Expectancy for Females: 79.4
, Country:Italy
Continent: Europe
Life Expectancy for Males: 75.1
Life Expectancy for Females: 81.4
, Country:Malta
Continent: Europe
Life Expectancy for Males: 74.6
Life Expectancy for Females: 79.1
, Country:Netherlands
Continent: Europe
Life Expectancy for Males: 75.0
Life Expectancy for Females: 80.6
, Country:Norway
Continent: Europe
Life Expectancy for Males: 74.8
Life Expectancy for Females: 80.6
, Country:Poland
Continent: Europe
Life Expectancy for Males: 66.7
Life Expectancy for Females: 75.7
, Country:Portugal
Continent: Europe
Life Expectancy for Males: 71.8
Life Expectancy for Females: 78.9

, Country:Romania
Continent: Europe
Life Expectancy for Males: 66.0
Life Expectancy for Females: 73.2
, Country:Russia
Continent: Europe
Life Expectancy for Males: 58.0
Life Expectancy for Females: 71.5
, Country:Slovakia
Continent: Europe
Life Expectancy for Males: 67.0
Life Expectancy for Females: 75.8
, Country:Slovenia
Continent: Europe
Life Expectancy for Males: 69.2
Life Expectancy for Females: 77.8
, Country:Spain
Continent: Europe
Life Expectancy for Males: 74.5
Life Expectancy for Females: 81.5
, Country:Sweden
Continent: Europe
Life Expectancy for Males: 76.2
Life Expectancy for Females: 80.8
, Country:Switzerland
Continent: Europe
Life Expectancy for Males: 75.3
Life Expectancy for Females: 81.8
, Country:United.Kingdom
Continent: Europe
Life Expectancy for Males: 74.5
Life Expectancy for Females: 79.8
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