Computer science (code 30424) a.y. 2019-2020

Practice 8 – Modules and libraries

You are asked to solve the following exercises:

1) The file you need to use is called **geometric_class.py** and contains a program written in Python aimed to solve some geometric problems. The program is incomplete and contains the definition of the class Circle.

You have to write the code necessary to complete the program so that:

- it defines the class Square with the attribute *side*
- it defines the class Rectangle with the attributes *base* and *height*
- it defines, for each of the two classes, a method to calculate the area
- it defines, for the Rectangle class, a method to calculate the diagonal of the rectangle using the Pythagorean theorem based on the following formula: $\boldsymbol{diagonal} = \sqrt{\boldsymbol{base}^2 + \boldsymbol{height}^2}$

Then complete the program:

- creating an instance for each class:
  - an instance of the class Circle with a radius of 9
  - an instance of the class Square with side of 10
  - an instance of the class Rectangle with base 7.5 and height 12
- calculating and showing on the screen the largest value of the area, among those of the three instances just created

2) The file you need to use is called **Wikipedia.py** and contains a list called *destinations2* with some possible tourist destinations. You are asked to write the code necessary to complete the program by creating a function called **wiki** that, using the objects available in the *webbrowser* library, shows in the default web browser the Wikipedia page for a city chosen by the user. The function must have the name of the city as a mandatory argument. Before proceeding, perform some research on Wikipedia to analyze the way in which the URL of the results pages is formed.

Create now a new function called **wiki2** that modifies the function **wiki** so that:

- it has a list of destinations (it is possible to use the list *destinations2*, but it must be possible to pass to the function any other list) as a mandatory parameter
- it chooses randomly the cities to visit from the list passed as an argument
- it shows in the default web browser the Wikipedia page for the chosen city
- it returns a text string in which it is specified the chosen city (i.e. “The coosen city is XXX”)

Then create a new function called **wiki3** that modifies the function **wiki2**. The new function must:

- have a list of destinations (it is possible to use the list *destinations2* but it must be possible to pass to the function any other list) as a mandatory parameter
- ask the user how many cities he desires to visit
- create a list called *to_be_visited*
- choose randomly the cities to visit from the list passed as an argument (Note: do not consider the problem of cities chosen twice)
- show in the default web browser the Wikipedia page for the chosen city
- returns the list *to_be_visited*

3) Create a new Python file called **holidays.py** in which you are asked, using the objects available in the *webbrowser* library, to create a program that must:

- create a new text file on your computer (i.e. in C:\Sample files\ ) called **holidays.txt** that in the first row has the headings "City" and "Web address" (on two columns separated by a tabulation)
- ask the user to enter a city he would like to visit
- write the name of the city and the web address of the Wikipedia page of the city in the file holidays.txt
- show in the default web browser the Wikipedia page of the city
- ask the user if he wants to search for a new city. If so, the program must:
    - ask to user the name of the new city
    - show in the default web browser its Wikipedia page
    - write the name of the city and the web address of the Wikipedia page of the city in the file holidays.txt

The program must continue to ask the user for a new city as long as he wishes. When the user decides not to enter new cities, the program must close the holidays.txt file and terminate.

4) Create a new Python file called **rename.py** in which you are asked, using the objects available in the *os* library, to create a program that shows on screen the name of all the files in a folder (i.e. C:\Sample files\ ), then checks if there is the file Raw_data.xlsx. If so, the program must ask the user for a new name to be given to the file, save it with the new name in the same folder and finally show the name of all the files in the folder on screen again.