Problem Set 7 - Dictionaries

Hello student,

the goal of this problem-set is to familiarize with the *dictionaries*.

You can find all the methods associated to dictionaries in the slides and on the Official Documentation.

Assignment 7.1 - Electronic store (3 points)

Write a program that simulates an electronic store.

The program should have in memory a dictionary to store the products with the corresponding prices. The user should insert how much he can spend and the program would return a list of affordable products.

The output should look like this:

```
Enter the maximum price: 500

List of all the items in store:
Monitor : 199.9
Keyboard : 99.9
Watch : 499
Laptop : 1499
Table : 800
Desktop computer : 999

List of affordable items:
Monitor : 199.9
Keyboard : 99.9
Watch : 499
```

Assignment 7.2 - Translator (3 points)

Write a program that translate words from one language to another.

The program should ask the user for a list of 5 words in one language and then the same words in another language. The words must be saved in a dictionary data structure.

The user should then insert any word in the first language and the program should print the corresponding word in the other language.

If the word to translate is new the program should ask for his translation and update his internal dictionary. The program should keep running until the user insert -1

For example:

```
List of words in the first language:
Dog
Student
History
Twenty
Information

Equivalent in the second language:
Cane
Studente
Storia
Venti
Informazione

Word to translate: Information
Translated word: Informazione

Word to translate: Ham
Insert translated word: Prosciutto
Dictionary updated!

Word to translate: Ham
Translated word: Prosciutto

Word to translate: -1
Stop!
```

Assignment 7.3 - Word counter (optional)

Write a program that ask the user for a sentence. The program should then count how many times each character appears and print the result in alphabetical order.

The output should look like this:

```
Text: Master Yoda... is Darth Vader my father? Mmm... rest I need.

Word counter:
  : 10
. : 7
? : 1
a : 5
d : 4
e : 6
f : 1
h : 2
i : 2
m : 5
n : 1
o : 1
r : 5
s : 3
t : 4
v : 1
y : 2
```

Assignment 7.4 - Factorial (optional)

Write a program that asks the user for a number and calculates the factorial. The program stop the execution when the user insert a number lower than 0. The program should use the dictionaries to improve his performance every time the user inserts a new number.

The output should look like:

```
Calculate factorial: 5
Result of 5! calculated in 0.03337860107421875 ms!
Calculate factorial: 5000
Result of 5000! calculated in 29.19292449951172 ms!
Calculate factorial: 5000
Result of 5000! calculated in 0.019788742065429688 ms!
Calculate factorial: 7000
Result of 7000! calculated in 8.979320526123047 ms!
Calculate factorial: 7012
Result of 7012! calculated in 0.1747608184814453 ms!
Calculate factorial: -1
```

Note: to print the time execution you should insert *import time* before the main. Then you could save the start time using *start_time = time.time()* and calculate the difference between the end and the start in seconds using *time.time() - start_time*