TP4 Python: Iteration & working with strings

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Github: https://github.com/bingzhilee/python4linguists

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1 String, list and dictionary

1. Determine manually the value of the following expressions given the variable s of type *string*.

s = "Hello world !"	value
len(s)	
s[0]	
s[-1]	
s[:2]	
s[3:]	
s.count("o")	
"or" in s	
s.split()	
s.split()[0].upper()	
s.find('o')	
s.replace('world','Alice')	
s.startswith('h')	

2. Determine the value of the following expressions given the variable l of type *list*.[1]

l = ['Alice', 'Max', 'Sally']	value
len(l)	
l[0]	
l[-1]	
l[:2]	
l.count("Max")	
"Lucy" in l	
l.append("Lucy")	l=
l.insert(1,"X")	l=
sorted(l)	

[1]For unseen methods/functions, consult the official documentation for Python https://docs.python.org/3/tutorial/datastructures.html.

3. Determine the value of the following expressions given the variable d of type *dict*.

`d = {"Marie":21,"Vincent":29,"Pascal":22}`	`value`
`len(d)`	
`d["Pascal"]`	
`d.keys()`	
`d.values()`	
`"Lucy" in d`	
`d["Pascal"]+=10`	`d["Pascal"]=`

2 Assignment

This assignment is due on **Friday, October 15, 2021** and counts for **20%** of the final grade. The submission can be a *.py file or a notebook file *.ipynb (send it to my email). If you use Colab, you can share your file with me by adding bingzhi2013@gmail as a collaborator.

1. (1) Comment each statement of the `while` loop

```
vowels = 'aeiou'
word = 'Seatle'
counter = 0
cursor = 0
while cursor < len(word): #
    if word[cursor] in vowels:#
        cursor += 1 #
        continue #
    cursor += 1 #
    counter += 1 #
print('The word has',counter,'consonant letters')
```

2. (1) Display all integers from 0 to 10 with a `while` loop
3. (3) Ask users to enter a word and then use a `for` loop to test:
   - if the word contains the letter 'a', if true, count and print the number of 'a' in the word
   - if the word contains the letter 'a' or 'e'
   - if the word contains the letter 'a' and 'e'
4. (3) Ask users to enter a French first group verb, write a program to check if the verb is valid (i.e. ending with 'er'), then conjugate the verb in indicative present tense. For example, given the verb 'parler', expected output is:

```
je parle
tu parles
il parle
nous parlons
vous parlez
ils parlent
```

5. (6) Ask users to enter a sentence, write a program that:

- checks if the sentence contains at least 10 words, if not true, ask users for input until they provide a sentence of length at least 10
- prints the most frequent letter and its occurrence
- prints the most frequent word and its occurrence
- (we don't distinguish uppercase and lowercase letters here, so 'D' and 'd' count for 2 occurrences for 'd')

Expected output:

```
Please enter a sentence: Hello, world!
You have entered only 2 words, please enter a new one with at least 10 words:
Does your Python bite? No, but it can hurt you, Python, by Indentation Error!
The most frequent letter: 'o' occurs 7 times
The most frequent word: 'python' occurs 2 times
```

6. (6) In this last exercise we try to create a small program that implements a game. The goal of the game is simple: the computer draws a random number and ask the user to make a guess.
   - if the guess is lower than the randomly generated integer, the program print 'Too low! Try again'
   - if the guess is higher than the target number, the program print 'Too high! Try again'
   - if the guess is equal to the target number, the program will ask the user if he/she wants to play again
   - set a maximum number of attempts allowed, once reached, the game is over.

   To draw a random number, we will use the `random` module of python. You have to first import it by writing `import random` at the beginning of your code :

   ```
   import random
   target_nb = random.randint(0,100) # draw an integer between 0 and 100
   ```

   Tip: use a `while` loop to manage the maximum number of attempts. Now it's your turn to play!

   Expected output:

   ```
   Hi! I'm thinking of a random number between 1 and 100.
   You'll have 7 tries to guess the number!
   --- Attempt 1
   Guess what number I am thinking of: 50
   Too high.
   --- Attempt 2
   Guess what number I am thinking of: 25
   Too high.
   --- Attempt 4
   Guess what number I am thinking of: 9
   Too low.
   --- Attempt 5
   Guess what number I am thinking of: 14
   Too high.
   ```

```
--- Attempt 6
Guess what number I am thinking of: 12
Too high.
--- Attempt 7
Guess what number I am thinking of: 10
Too low.
Aw, you ran out of tries. The number was 11.
```