

Python refresher

Create a folder dedicated to this lab on your computer. Use it throughout the session.

1. Dictionaries

Create a file called `exercise01.py`.

Exercise 1.1 - number of occurrences of a letter in a string

In this file, create a Python function `str2dict` that:

- takes a string as its only argument
- returns a dictionary:
 - the keys of the dictionary are the letters that appear in the string
 - for each letter, the associated value in the dictionary is the number of occurrences of the letter in the string

Examples:

```
>>> str2dict("aaaa")
{'a': 4}
```

```
>>> str2dict("Hello!")
{'H': 1, 'e': 1, 'l': 2, 'o': 1, '!': 1}
```

Exercise 1.2 - number of occurrences, with filters

Create a function `str2dict_plus`. *This function can reuse the `str2dict` function.* It has an argument (the string). It must:

- remove spaces
- remove punctuation
- count uppercase and lowercase letters together, but return lowercase letters in the result

Example:

```
>>> str2dict_plus("Hello world!")
{'h': 1, 'e': 1, 'l': 3, 'o': 2, 'w': 1, 'r': 1, 'd': 1}
```

Exercise 1.3 - histogram of letters

Create a function `histogram`. This function will display a list of all letters in a string, with as many "*" characters as the letter appears in the string. *You can use the output from `str2dict_plus`.*

```
>>> histogram("Haaaaah")
h **
a *****
>>> histogram("Hello world!")
h *
e *
l ***
o **
w *
r *
d *
```

2. Lists

Create a new file `exercise02.py`.

2.1 Open a file and read line by line

In Visual Studio Code, create a new file called `data01.txt`. Copy/paste the following into the file, and save it:

```
Tim
John
Alice
Bob
Kim
Donald
Bob
Tim
```

Create a function `count_people`. It takes a filename as argument, and returns the number of lines in the file.

Hint: you can use `readLines`, or `read`, or `split`, or use the file as an iterator.

Example:

```
>>> count_people("data01.txt")
8
```

Adjust the function to count the number of **unique** names in the file. *Hint: you can use a `set` to filter out duplicates!*

Example:

```
>>> count_unique_people("data01.txt")  
6
```

Experiment with other files!

3. Loops and conditions

Look at the file `shapes.py` and complete the Python code to make it work. Read the docstrings / documentation!

Grading / evaluation

This lab is not graded. You will be evaluated in class on similar topics in a few weeks. Use it for practice!