Exercise Sheet 0(a)*

Computer Vision 1
WiSe2021

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Exercise 1 — Python Tutorial - 0 Points - Theory Exercise

Go through chapters 1 till 6 of the official Python tutorial [1]. Answer the following questions:

1. Which meaning do three dots have (`...`) in the interactive terminal?
2. Which character corresponds to the modulo operator?
3. How can you set the last value of a list?
4. Why is the function `range()` often used in conjunction with lists?
5. How can you iterate over two lists in a `for`-loop? Do the lists have to be the same length for this?

Exercise 2 — Python Console in Spyder - 0 Points - Programming task
Solve this Exercise in the Python Console in Spyder (*IPython console* bottom right).

1. Create two lists: a list with five zeros and a list with six ones.
2. Combine both lists into one.
3. Create one more list with numbers from 1 to 10 and connect both lists.
4. Filter out all the duplicates. Hint: Which data structure does not allow duplicates?
   The result should look like this:

```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

5. Now remove the number 2 from the list.
6. Insert the string `"2"` (type `str`) and a value of the type bool into the list. Is this possible?
7. Is the number 2 now included?

Exercise 3 — List reverse - 0 Points - Programming task
Note: For the solution of this task the usage of loops is not allowed!

Write a script that reverses two sublists of a list. To do this, you should first create a list with the numbers from 1 to 9 and then input the index of an element. The element at this index should now be used to divide the list into two new sublists. One sublist contains all elements to the left of the selected element and the other sublist contains all elements to the right of the selected element. Then both sublists should be reversed and output together with the selected element. For example:

```
[1, 2, 3, 4, 5, 6, 7, 8, 9]
Input index: 2
[2, 1, 3, 9, 8, 7, 6, 5, 4] #Sublists 1,2 and 4,5,6,7,8,9
```

Reading the text (`str`) from the console (here: IPython-console) can be done in Python by using the function `input()`, the function reads the input and returns it. If you only want to output something on the console use function `print()` instead.

*This is a translation of Exercise Sheet 0 originally prepared by Christian Wilms and Simone Frintrop for the course Bildverarbeitung SS2020

[1] https://docs.python.org/3/tutorial/

```
>>> s = input('What is your name? ')
What is your name? Max
>>> print(s)
'Max'
```

The import of external packages is not allowed for the solution of the following tasks!

Exercise 4 — Scrabble - 0 Points - Programming task
Create a **function** in a script that takes a word and calculates its Scrabble score. Use the following values for this:

```
values = {"a": 1, "b": 3, "c": 4, "d": 1, "e": 1, "f": 4, "g": 2, "h": 2, "i": 1, "j":
     6, "k": 4, "l": 2, "m": 3, "n": 1, "o": 2, "p": 4, "q": 10, "r": 1, "s": 1, "t":
    1, "u": 1, "v": 6, "w": 3, "x": 8, "y": 10, "z": 3, "ä": 6, "ö": 8, "ü": 6}
```

An example looks like this:

```
scrabble('informatikum')
23
```

Hint 1: The following should be the first line in your script so that the umlauts are correctly recognized:

```
# -*- coding: utf-8 -*-
```

Hint 2: Assume that the entry always consists of lowercase letters.

Exercise 5 — List of 5 - 0 Points - Programming task
We want to know a little more about lists of numbers. Writes a script that reads five numbers from the console (`floats`) and outputs the following information on the console:

- List of all inputs
- Minimum with Index
- Maximum with Index
- Median
- Number of unique elements
- Number of integers ($\mathbb{Z}$)
- Number of other numbers ($\mathbb{R} \setminus \mathbb{Z}$).

For example:

```
One number please: 5
One number please: 4
One number please: 2.2
One number please: 3
One number please: 5
[5.0, 4.0, 2.2, 3.0, 5.0]
min 2.2 2
max 5.0 0
median 4.0
unique 4
integers 4
real numbers without integers 1
```