

## Assignment 5 - Working with Files and Lists

- The problems of this assignment must be solved in Python.
- The TAs are grading solutions to the problems according to the following criteria:  
<https://grader.eecs.jacobs-university.de/courses/350111/2017.2is/Grading-Criteria-Python.pdf>

### **Problem 5.1** *Read and write from/to file* (1 point)

#### **Presence assignment, due by 18:30 h today**

Create a text file called `"input.txt"` which contains two characters using an editor. Then write a program which reads the two characters from the file and computes the product of the corresponding ASCII codes and writes the result in another file called `"output.txt"`.

*You can assume that the input file will have a valid content.*

### **Problem 5.2** *The sum of numbers from file* (1 point)

#### **Presence assignment, due by 18:30 h today**

Create a text file called `"numbers.txt"` using an editor. This file should contain integer numbers separated by newlines. Then write a program which reads all values from the file `"numbers.txt"`, sums them and prints the sum on the screen.

*You can assume that the input file will have a valid content.*

### **Problem 5.3** *Count words from a file* (1 point)

Write a program which reads from the keyboard the name of a text file. Then the program should read the content of that file line by line and should count the words on each line of the file. The number of the words per line (specifying the line and the number of words) should be printed on the screen.

*Note: You have to create one or more text files using an editor to be able to test your program.*

*You can assume that the input from the keyboard and the content of the input file will be valid.*

### **Problem 5.4** *Copy a file* (1 point)

Write a program which reads the name of a text file from the keyboard. The program should read the content of that file and write it into another file called `"copy.txt"`.

*You can assume that the input from the keyboard and the content of the input file will be valid.*

### **Problem 5.5** *Add/multiply list* (1 point)

Define a function `add(lst, val)` and a function `multiply(lst, val)` that adds `val` and multiplies by `val` (respectively) (to) all the numbers of a list of numbers and returns a new list with modified values. Write a program which enters from the keyboard an integer value `n` followed by a list of length `n` consisting of floats. Use the two functions from above for adding 1.5 to the list and to multiply the elements of the list by 5. Print the original list and the two resulting lists on the screen outside of the functions.

*You can assume that the input will be valid.*

### **Problem 5.6** *Printing a histogram* (1 point)

Define a function `histogram(lst)` that takes a list of integers as parameter and prints a corresponding histogram on the screen. For example, `histogram([4, 9, 7])` should print the following:

```
****
*****
*****
```

Your program should enter an integer value  $n$  from the keyboard followed by  $n$  values as elements of the list. Then the histogram function should be called.

*You can assume that the input will be valid.*

### **Problem 5.7** *Max and min of a list*

(1 point)

Write a program which enters from the keyboard a list of non-zero integers. Your program should repeatedly read values as elements of a list until zero is entered. Then the maximum and minimum value of the list should be printed on the screen.

*You can assume that the input will be valid and zero will not be an intended element of the list.*

### **Problem 5.8** *Common elements in two lists?*

(1 point)

Define a function `overlapping(list1, list2)` that takes two lists as parameters and returns `True` if they have at least one member in common, and `False` otherwise. Your program should enter two lists of positive integer values or zero from the keyboard. Entering a negative number (i.e.,  $< 0$ ) should mark the end of a list. The negative values should not be added to the lists. After calling the function the program should print a corresponding text message (e.g., "The two lists are overlapping." or "The two lists are not overlapping.").

*You can assume that the input will be valid.*

### **Problem 5.9** *Longest word*

(1 point)

Write a function `longest_word(lst)` that takes a list of words as parameter and returns the longest one. Your program should enter a string from the keyboard containing multiple words separated by space. Then the list of words corresponding to this string should be generated. Finally, the function should be called after which the longest word and its length should be printed on the screen outside of the function.

*You can assume that the input will be valid.*

## **How to submit your solutions**

Name the programs `a5_px.py`.

Each program **must** include a comment on the top like the following:

```
# JTSK-350111
# a5_p1.py
# Firstname Lastname
# myemail@jacobs-university.de
```

You have to submit your solutions via *Grader* at

**<https://grader.eecs.jacobs-university.de>.**

If there are problems (but only then) you can submit the programs by sending mail to

`k.lipskoch@jacobs-university.de` **with a subject line that starts with JTSK-350111.**

Please note, that after the deadline it will not be possible to submit solutions. It is useless to send solutions then by mail, because they will not be accepted.

*Your code must run without any errors or warnings under python3.x.*

**This assignment is due by Sunday, February 4<sup>th</sup>, 10:00 h**