

## Lab 2: Lists

Due date: Sunday February 10 2019, 11:59pm

### Assignment

1. The main task in this lab is to separate text into lists and do do some statistics on these lists. The data for this lab needs to be downloaded from

[https://www.gutenberg.org/ebooks/search/?sort\\_order=downloads](https://www.gutenberg.org/ebooks/search/?sort_order=downloads)

Pick a few books you like and report (you will need to download the textfile (plain text UTF-8))

- The average sentence length. [use the function in the cheatsheet to read the book in, do not worry about some special cases like titles, sections, numbers etc] To calculate the average sentence length the easiest way is to read the book as a long string, and then split the string on the '.' into a list and then use a for loop over all sentences to split on '.' and then count the length of that list (`len(list)`) and sum these length up, once all sentences are summed up, divide by the number sentences and print the average length.
  - The average word length. The loop from above can be extended that when you split the sentence into words, split each word into characters (using `list(string)`) and the also sum these up and report at the end the average word lengths.
  - How many 1-letter words, 2-letter words, ... 20-letter words are present. Create an array `c` with 21 zero entries, every time you encounter a word get the length of the word which can be used as an index into `c` and you can then augment `c[index] + 1`. At the end print the `c` which now contains all counts for the words.
  - What are the 100 most common words [use a dictionary]; Create a dictionary fill in the words as keys and the original value for each word is 1; then loop over all words and test wether the word is already a key or not and if not create a new dictionary entry, if yes add 1 to the value.
2. Upload the python script and the output as a zip to Canvas before the deadline. Your output should contain the book titles and the statistics.

## Cheat sheet

```
#!/usr/bin/env python
# (c) yourname
#-----
#
#
# reads the book into a string
def readbook(filename, clean=True):
    '''
    Reads a textfile into a single string, ignoring line breaks.
    The function has a single argument: the infile name
    and it returns a single string containing the whole file,
    if the variable clean is True then replace all upper case
    letters with lowercase and also remove ",;:-'
    '''
    with open(filename, 'r') as myfile:
        data=myfile.read().replace('\n', '').replace('\r','').replace('\t',' ')
    if clean:
        data = data.replace(';',' ').replace(',',' ').replace(':', ' ')
        data = data.replace('-', ' ').replace('"','').replace("'",").lower()
    return data

#
# reads all sentences from a text into a list
def get_sentence(text):
    '''
    reads all sentences from the text (using a '.' as the end of a sentence
    '''
    pass #replace pass with the code that splits the text into a list

#
# count words in sentence
def count_words(listofsentences):
    '''
    loops over all setences and splits each setence, counts words per setence
    and returns the average number of words per sentence
    '''
    pass #replace pass with your code

#
# count characters in word
def count_chars_in_word(listofwords):
    '''
    loops over all words in a sentence and counts characters in a word
    sums them up and returns the average number of words and also the
    number of words of length 1,2,3,4..,20
    '''
```

```
pass
```

```
if __name__ == '__main__':  
    data = readbook('testbook.txt')  
    # more stuff to follow
```