Universität Greifswald
Institute für Mathematik and Informatik
Lecturer: Marc Hellmuth Tutor: Nikolai Nøjgaard

3. Exercise "Datenstrukturen und Effiziente Algorithmen", WS 18/19

Exercise 1: (20+5+5=30 Credits)

(a) Implement the Z-Algorithm and the Simple Linear-Time Exact Matching Algorithm (see Slide 1.20 in Zalg.pdf).

Hand in your (clearly legible and commented) source code.

(b) Use your implementation to find the positions and number of occurences of the pattern

$$p = \text{“schon an die Lippen”}$$

and

$$p = \text{“Nacht”}$$

in “Faust” by Goethe (p without quotation marks).

(c) Use your implementation to find the number of occurences of the pattern $p = \texttt{gcgg}$ in the genom of the gut bacteria *E. coli*.

“Faust” and the *E. coli* genom is provided at the homepage, see working material.

When handing in programming exercises, always document how to compile and run your program.

Do not copy source-code from WWW - keep in mind, we are able to efficiently compute pattern-matchings ;) !

Deadline: Wednesday - November 7, 2018 - 12.15pm