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Advanced Algorithms

WS 2017/18

Homework 6

20.11.2017

Exercise 1:

Develop an algorithm which obtains a suffix tree for x as input and constructs a position tree for x in linear time.

Exercise 2:

Develop algorithms for the four operations which should be supported by the index of a text string x . Show that the suffix tree for a text string x can be prepared in linear time such that the number of occurrences of any string $y \in \Sigma^+$ in x can be determined in $O(|y|)$ time.

Exercise 3:

- a) Work out the algorithm for the solution of the longest common substring problem.
- b) Generalize the algorithm such that a longest common substring of k strings x_1, x_2, \dots, x_k can be computed in $O(kn)$ time where $n := |x_1| + |x_2| + \dots + |x_k|$.