University of Freiburg
Dept. of Computer Science
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Algorithms and Datastructures
Winter Term 2023
Exercise Sheet 12

Due: Wednesday, February 7th, 12pm

Exercise 1: Rabin-Karp Algorithm   *(10 Points)*

(a) Implement the Rabin-Karp algorithm. You may use the template `StringMatching.py`. The algorithm should return a Python-list containing all starting points of the pattern. That is, for each time the pattern is recognized, the list should contain the position of the first letter of this appearance.

(b) Run your algorithm on the text and pattern given in `input.txt`. Write the output into `erfahrungen.txt`.

   Remark: When choosing the parameters b and M, consider that the procedure **`read_input`** *used on* **`input.txt`** *creates an array with values from* **`ord(' ')`** $= 32$ *(whitespace) to* **`ord('z')`** $= 122$.

Exercise 2: Knuth-Morris-Pratt Algorithmus   *(10 Points)*

Consider the pattern $P = BBABAB$ and the text $T = ABBABBABABBABABBA$.

(a) Compute the array S of the Knuth-Morris-Pratt algorithm.   *(5 Points)*

(b) Use the Knuth-Morris-Pratt algorithm to find all appearances of P in T. Document the steps analogously to the lecture.   *(5 Points)*