3. Übung ”Bioinformatik”, SS 15

Aufgabe 1: (5 Credits)
Given the string $T$ and the pattern $P$. The worst-case time complexity of the brute-force pattern matching algorithm is in $O(|P|(|T| - |P| + 1))$.

Give an example of a string $T$ and a pattern $P$ such that the brute-force pattern matching algorithm indeed performs $|P|(|T| - |P| + 1)$ comparisons of characters. This illustrates that the bound is actually tight.

Aufgabe 2: (7.5 Credits)
Use the existence of a linear-time exact matching algorithm to solve the following problem in linear time. Given two strings $\alpha$ und $\beta$, determine if $\alpha$ is a cyclic (or circular) shift of $\beta$.

Aufgabe 3: (7.5 Credits)
Show that the Edit-Distance of two strings $u$ and $v$ is the same as the Edit-Distance of the inverted strings $u^{-1}$ and $v^{-1}$, i.e.,

$$\text{Edit-Distance}(u, v) = \text{Edit-Distance}(v^{-1}, u^{-1}),$$

where $w^{-1} = w_kw_{k-1} \ldots w_2w_1$ whenever $w = w_1w_2\ldots w_{k-1}w_k$.

Deadline: Monday - May 11, 2015 - 4.15pm