

1. Build a suffix array for the string $S = zyyxy$.
2. Find the longest common substring of $zyyzy$ and $yzzyy$ using suffix trees.

3. [Gusfield, Section 1.6, Problem 3] Let α and β be strings with $|\alpha| = m$ and $|\beta| = n$. Describe an $O(m + n)$ algorithm that finds the longest suffix of α that exactly matches a prefix of β . For example, given $\alpha = ACCGTG$ and $\beta = GTGACCAGAT$, the solution is GTG .

4. Let α and β be strings with $|\alpha| = |\beta| = n$. We say that α is a cyclic rotation of β if a cyclic permutation of the letters of α match β . For example, $\alpha = ACCGTG$ is a cyclic rotation of $\beta = GTGACC$.
 - (a) [Gusfield, Section 1.6, Problem 1] Use *linear-time exact matching* to describe an $O(n)$ algorithm for determining whether α is a cyclic rotation of β .
 - (b) [Gusfield, Section 1.6, Problem 2] Now let $|\alpha| = m$ and β be a *circular* string with $|\beta| = n > m$. A circular string of length n is a string in which character n is considered to precede character 1. Use *linear-time exact matching* to describe an $O(n)$ algorithm to find all occurrences of α in the circular string β .