Exercises on Strings

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Exercise 1. Given a text T, find the longest substring of T which occurs also in its reversal T^r.

Exercise 2. Write an algorithm that, given a string T, returns the longest palindromic substring of T (i.e., the longest substring of T that reads the same left-to-right and right-to-left. (**Hint:** use the generalised suffix tree of T and T^r). Consider, for example, $T = aababaca$

Exercise 3. Give an algorithms that counts the number of occurrences of a pattern P in a text T and assess its time complexity. How does it compare with the time complexity of the pattern matching algorithm, which additionally reports all positions at which P occurs in T?

Exercise 4. Write an algorithm that finds the longest suffix-prefix overlap of a string T (i.e., the longest prefix of T which is equal to a suffix of T) in time $O(|T|)$.

Exercise 5. Consider a weighted definition of edit distance in which insertions and deletions have cost 2, and replacements have cost 1. Can you modify the dynamic programming algorithm for computing the edit distance between to string to compute this weighted edit distance?