

Mandatory Exercise: Compression

Inge Li Gørtz

1 Longest common extension in LZ78 In this exercise you are given an LZ78 encoding of a string T . The string T has length N and the encoding has n phrases. You can assume that you have the LZ78 trie over the phrases.

1.1 Longest common prefix phrase. Give an efficient $O(n)$ space data structures that can answer the query.

$\text{LCPP}(P_1, P_2)$: Return the id of the longest phrase (of the LZ78 encoding) that is a prefix of both phrase P_1 and P_2 .

1.2 Longest common extension phrase Give an efficient $O(n)$ space data structure that can answer the query.

$\text{LCEP}(x)$: Return the id of the longest phrase (of the LZ78 encoding) that is a prefix of the suffix of T starting at position x .

You can ignore the preprocessing time.