Problem Set 8 (Written Part)

Tianshu Lv tl1443

Suffix Trie: O(n^2)

For a n-length string:

First we insert n-length string, which takes n time.

Then we insert n-1-length string, in all cases it takes n-1 time as well.

So the whole run-time is n+n-1+n-2+…+1=O(n^2)

Compressed Suffix Trie:

For a n-length string:

First we insert n-length string, which takes 1 time

Then we insert n-1-length string. The worst case is n-1 time, while the best case is 1 time.

So the best-case total runtime is O(n) and the worst-case total runtime is O(n^2).

Therefore, runtime is O(nlogn)

Finding LCP:

The longest common prefix is calculated by compressed suffix trie. So for the worst case, I get the longest prefix is half of the string O(n/2) and the best case is O(1). So the total runtime is O(logn).