

2708. Find the String with LCP

Difficulty : Hard

<https://leetcode.com/problems/find-the-string-with-lcp>

We define the `lcp` matrix of any **0-indexed** string `word` of `n` lowercase English letters as an `n x n` grid such that:

- `lcp[i][j]` is equal to the length of the **longest common prefix** between the substrings `word[i,n-1]` and `word[j,n-1]`.

Given an `n x n` matrix `lcp`, return the alphabetically smallest string `word` that corresponds to `lcp`. If there is no such string, return an empty string.

A string `a` is lexicographically smaller than a string `b` (of the same length) if in the first position where `a` and `b` differ, string `a` has a letter that appears earlier in the alphabet than the corresponding letter in `b`. For example, "aabd" is lexicographically smaller than "aaca" because the first position they differ is at the third letter, and 'b' comes before 'c'.

Example 1:

Input: `lcp = [[4,0,2,0],[0,3,0,1],[2,0,2,0],[0,1,0,1]]`

Output: "abab"

Explanation: `lcp` corresponds to any 4 letter string with two alternating letters. The lexicographically smallest of them is "abab".

Example 2:

Input: `lcp = [[4,3,2,1],[3,3,2,1],[2,2,2,1],[1,1,1,1]]`

Output: "aaaa"

Explanation: `lcp` corresponds to any 4 letter string with a single distinct letter. The lexicographically smallest of them is "aaaa".

Example 3:

Input: `lcp = [[4,3,2,1],[3,3,2,1],[2,2,2,1],[1,1,1,3]]`

Output: ""

Explanation: `lcp[3][3]` cannot be equal to 3 since `word[3,...,3]` consists of only a single letter; Thus, no answer exists.

Constraints:

- `1 <= n == lcp.length == lcp[i].length <= 1000`
- `0 <= lcp[i][j] <= n`