Program Name- Longest Common Prefix | Set 3 (Divide and Conquer)

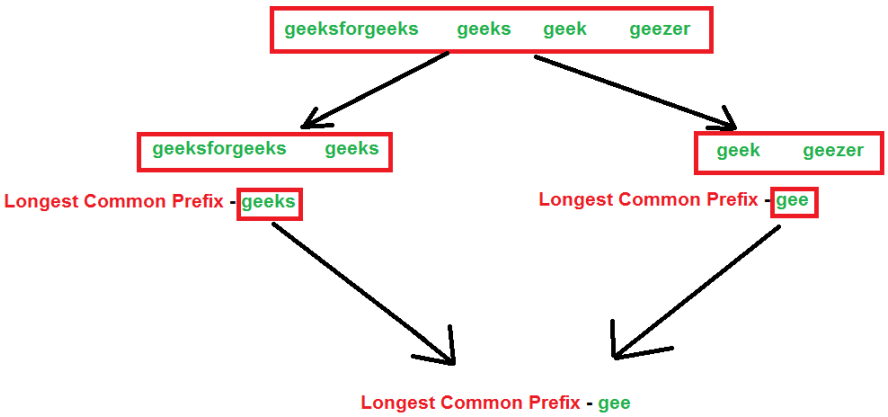
Project Category- Strings

Programming Paradigm Used- Divide and Conquer

Algorithm/Explanation-

We first divide the arrays of string into two parts. Then we do the same for left part and after that for the right part. We will do it until and unless all the strings becomes of length 1. Now after that we will start conquering by returning the common prefix of the left and the right strings.

The algorithm will be clear using the below illustration. We consider our strings as - "geeksforgeeks", "geeks", "geek", "geezer"



Time Complexity-

The recurrence relation is
$T(N) = 2T(N/2) + O(M)$,

where
N = number of strings,
M = avg. length of each string

So we can say that the time complexity is $O(NM)$

Auxiliary Space-

To store the longest prefix string we are allocating space which is $O(M \log N)$ where,
N = number of strings,
M = avg. length of each string

The $\log N$ term is due to recursion stack.