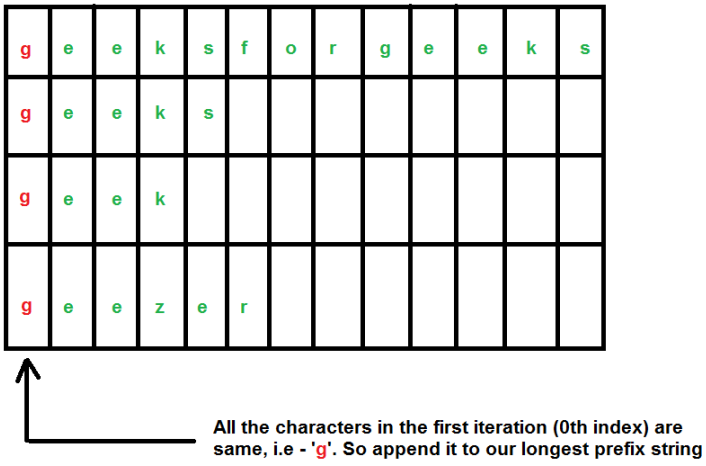
Program Name- Longest Common Prefix | Set 2 (Character by Character Matching)

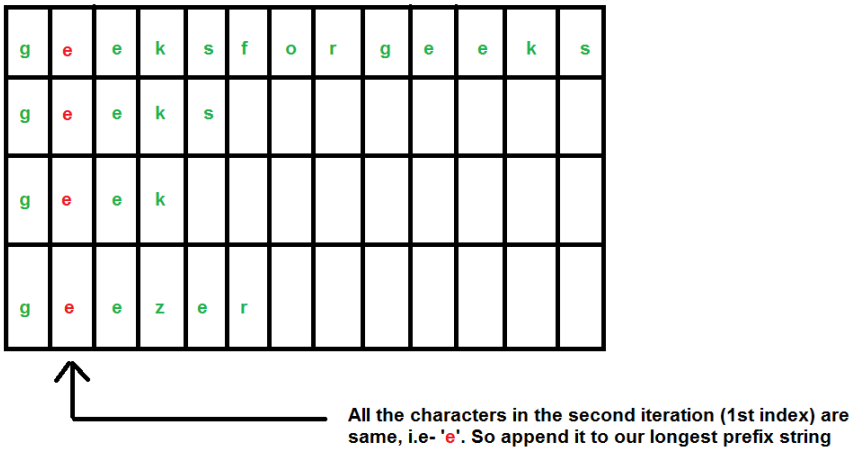
Project Category- Strings

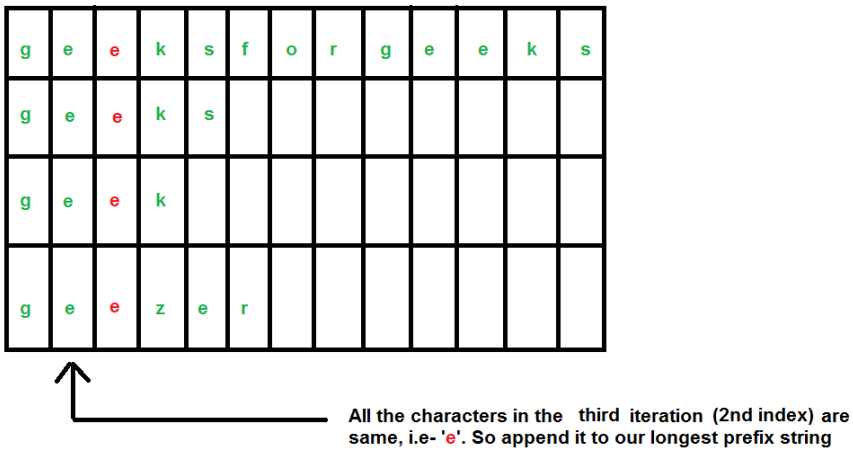
Algorithm/Explanation-

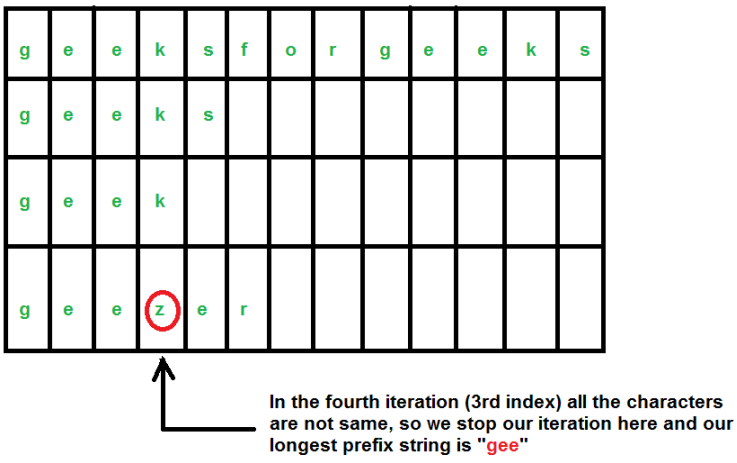
In this algorithm, instead of going through the strings one by one, we will go through the characters one by one.

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




g e e k s f o r g e e k s
g e e k s
g e e k
g e e z e r
All the characters in the second iteration (1st index) are same, i.e- 'e'. So append it to our longest prefix string


g e e k s f o r g e e k s
g e e k s
g e e k
g e e z e r
All the characters in the third iteration (2nd index) are same, i.e- 'e'. So append it to our longest prefix string


g e e k s f o r g e e k s
g e e k s
g e e k
g e e z e r
In the fourth iteration (3rd index) all the characters are not same, so we stop our iteration here and our longest prefix string is "gee"

How this algorithm is better than the "Word by Word Matching" algorithm ?-

In Set 1 we discussed about the "Word by Word Matching" Algorithm.

Suppose you have the input strings as- "geeksforgeeks", "geeks", "geek", "geezer", "x".

Now there is no common prefix string of the above strings. By the "Word by Word Matching" algorithm discussed in Set 1, we come to the conclusion that there is no common prefix string by traversing all the strings. But if we use this algorithm, then in the first iteration itself we will come to know that there is no common prefix string, as we don't go further to look for the second character of each strings.

This algorithm has a huge advantage when there are too many strings.

Time Complexity-

Since we are iterating through all the characters of all the strings we so we can say that the time complexity is O(NM) where,
N = Number of strings
M = Average length of each string

Auxiliary Space-

To store the longest prefix string we are allocating space which is O(N) where,
N = length of the largest string among all the strings