Save Dr. Watson!

locked

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You should provide a 'Dynamic Programming' algorithm to solve this problem.

Dr. Watson has been kidnaped! Sherlock Holmes was contacted by the kidnapper for ransom. Moments later he received a message from Dr. Watson's phone. The message contained three random strings. Sherlock being Sherlock, was able to deduce immediately that Dr. Watson was trying to give a hint about his location. He figured out that the longest common subsequence between the 3 words is the location. But since it was too easy for him, he got bored and asked you to find out what the actual location is.

Your task is to find the longest common subsequence from the 3 given strings before it is too late.

Definitions: Subsequence - A subsequence is a sequence that can be derived from another sequence by deleting some or no elements without changing the order of the remaining elements. For instance, given a sequence "drew"; "d", "w", "de", "drw", "drew" are all examples of valid subsequences (there are also others), while "er", "wdre" are not.

Note: W is a common subsequence of X, Y, and Z if and only if W is a subsequence of X, W is a subsequence of Y and W is a subsequence of Z.

If a common subsequence does not exist, return "Does not exist" (without quotes)

Your goal is to find the longest common subsequence, not just any common subsequence.

Input Format

Three lines, each containing a string.

Note: Each string only contains lowercase English alphabet letters (i.e. a, b, ... , y, z).

Constraints

1 <= x*y*z <= 10^7

x, y, and z are the lengths of the input strings X, Y, and Z respectively.

Output Format

Location of Dr. Watson (longest common subsequence of all the 3 sequences)

Sample Input 0

```
uwytubiweutpowegbiutpoweeniwotiweqz
fdsjkhfbklsdfigkjfdbensdjdlqa
cmnvbcxmbimxcnbvmgxmnbvcxbexmbnnaz
```

Sample Output 0

```
bigben
```

Explanation 0

uwytu **bi** weutpowe **gb** iutpow **e** e **n** iwotiwe *qz*

fdsjkhf **b** klsdf **ig** kjfd **ben** sdjdl *qa*

cmnv **b** cxmb **i** mxcnbvm **g** xmn **b** vcxb **e** xmb **n** n *az*

Note that the longest common subsequence between the first and the second string is **bigbenq**. Similarly the LCS between second and the third is **bigbena** and the first and the third is **bigbenz**

However, what we need is the longest common subsequence between all the three strings which turns out to be **bigben**

Submissions: 87
Max Score: 100
Difficulty: Medium

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Current Buffer (saved locally, editable)

Python 3

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Upload Code as File

Test against custom input

Run Code

Submit Code