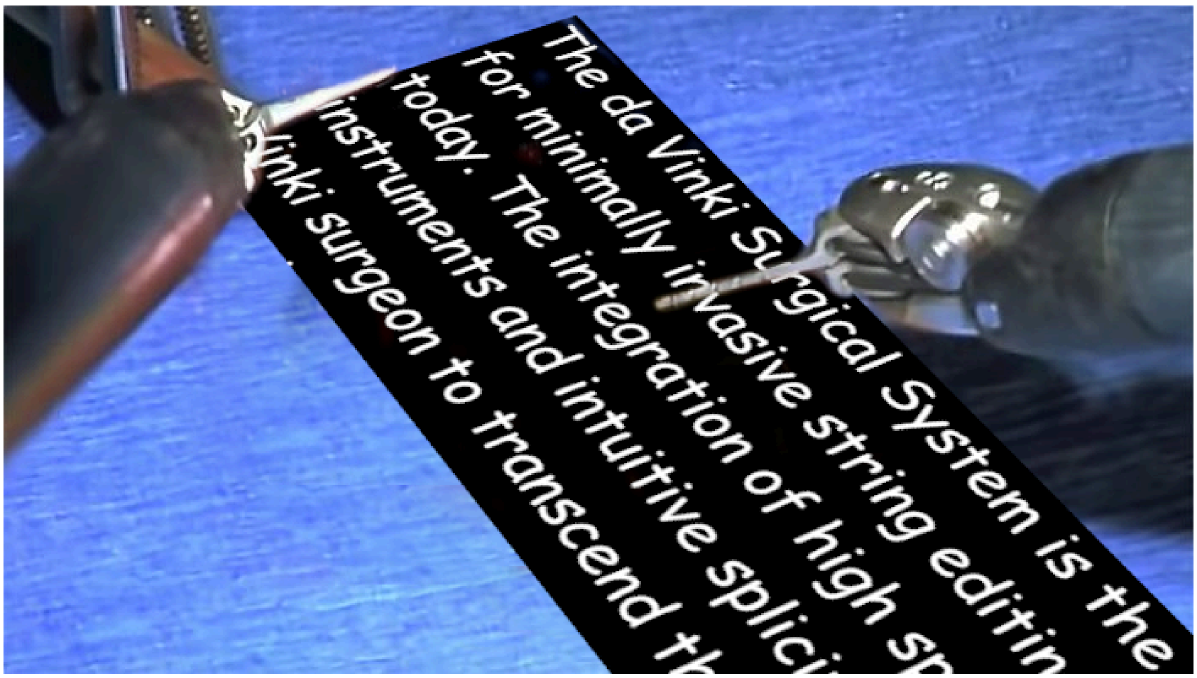
Problem 5: They did surgery on a string! 🍇
6+4+3 Points

Problem ID: `strgery`
Rank: `2+3+3`

Introduction



Problem Statement

Given a string $\mathbf{S}$ and another string $\mathbf{P}$, find the positions of two non-empty non-overlapping substrings of $\mathbf{S}$, such that concatenating them will yield $\mathbf{P}$.

A substring is defined as a contiguous segment of characters from a string. For example, `lico`, `ca` and `a` are substrings of `calico` but `alco` is not.

Concatenating is defined as putting two strings next to each other to create a new string. For example, concatenating `cali` and `co` yields `calico`

If there is no solution, output `IMPOSSIBLE`

Input Format

The first line of the input contains a single integer $\mathbf{T}$ denoting the number of test cases that follow. For each test case:

- The first line contains the string $\mathbf{S}$, the string from which to find the substrings.
- The second line contains the string $\mathbf{P}$, the string to make by concatenating substrings.

Output Format

For each test case, output a single line containing four space-separated integers s_1 l_1 s_2 l_2 where:

- s_1 denotes the starting position of the first substring.
- l_1 denotes the length of the first substring.
- s_2 denotes the starting position of the second substring.
- l_2 denotes the length of the second substring.

such that concatenating the first substring and the second substring yields $\mathbf{P}$. When giving positions, the position of the first character is 0 (zero-indexed), the position of the second character is 1, the position of the third character is 2, and so on.

If there is no solution, output `IMPOSSIBLE` instead.

Constraints

$\mathbf{S}$ and $\mathbf{P}$ contain exclusively letters from the lowercase English alphabet:
`abcdefghijklmnopqrstuvwxyz`

Main Test Set

$1 \le \mathbf{T} \le 100$
$1 \le |\mathbf{S}| \le 20$
$1 \le |\mathbf{P}| \le 20$

Bonus Test Set 1

$\mathbf{T} = 1$
$1 \le |\mathbf{S}| \le 1000$
$1 \le |\mathbf{P}| \le 1000$

Bonus Test Set 2

$\mathbf{T} = 1$
$1 \le |\mathbf{S}| \le 10^5$
$1 \le |\mathbf{P}| \le 10^5$

Sample Test Cases

Sample Input Download

```
7
surgeryonastring
surgerystring
surgeryonastring
astringsurgery
strgerystrgerystrgerystrgery
strstr
surgeryonastring
stringonasurgery
aaaaaaab
aaaaaaaaa
ab
ab
a
a
```

Sample Output Download

```
0 7 10 6
9 7 0 7
7 3 14 3
IMPOSSIBLE
IMPOSSIBLE
0 1 1 1
IMPOSSIBLE
```

Note that this is one of many possible correct outputs. If there are multiple solutions, you may output any of them.

Sample Explanations

Test Case #1:

We can construct `surgerystring` from `surgeryonastring` by first taking the substring starting at position 0 with length 7 (`surgery`) and then concatenating it with the substring starting at position 10 with length 6 (`string`). Concatenating `surgery` and `string` yields `surgerystring` for our desired answer.

Test Case #2:

We can construct `astringsurgery` from `surgeryonastring` by taking the substring at position 9 of length 7 (`astring`) and the substring at position 0 of length 7 (`surgery`). **Note that this is a valid solution despite the first substring having a higher start position than the second substring.**

Test Case #3:

There are many possible solutions to this test case, as there are many different ways to find the substring `str` in `strgerystrgerystrgerystrgery`.

Test Case #4:

This test case is impossible, so we output `IMPOSSIBLE`

Memes

This page is not part of the problem. These are only here to maintain an even page count.

S U R G E R Y   I N   B I O