Homework 6

(Time Limit: 1 second)

Problem Description

By convention, any sequence that results from deleting several (possibly zero) characters from a string s is called a subsequence of s. For example, “heo” and “ell” are subsequences of “hello”, whereas “eh” and “abc” are not.

Given two strings A and B, we want to find the length of a longest common subsequence of A and B.

Hint: Write $|A|$ and $|B|$ for the length of A and B, respectively. For all $0 \leq i \leq |A|$ and $0 \leq j \leq |B|$, denote by $\mathrm{lcs}(i,j)$ the length of a longest common subsequence of the length-i prefix of A and the length-j prefix of B. As boundary conditions, $\mathrm{lcs}(0,j) = \mathrm{lcs}(i,0) = 0$ for all $0 \leq i \leq |A|$ and $0 \leq j \leq |B|$. For all $1 \leq i \leq |A|$ and $1 \leq j \leq |B|$,

$$\mathrm{lcs}(i,j) = \mathrm{lcs}(i-1,j-1) + 1$$

if the ith character of A is the jth character of B, and

$$\mathrm{lcs}(i,j) = \max\big(\mathrm{lcs}(i-1,j),\mathrm{lcs}(i,j-1)\big)$$

otherwise.

Input Format

Each test case contains two nonempty strings A and B, separated by whitespace character(s) and consisting of characters 'a' and 'b'. Two consecutive test cases are separated by whitespace character(s). The input terminates with EOF.

Output Format

For each test case, output the length of a longest common subsequence of A and B.

Technical Specifications

- There are at most 10 test cases.

- $1 \leq |A| \leq 100$ and $1 \leq |B| \leq 100$.

Example

Sample Input:	**Sample Output:**
aaab bbaa aababa abaabbaa ababaaa aaabba aabbaab bbabba ababbbaaab bbaaba	2 5 4 4 5