

## Problem G. Game With Dealer

Input file: *standard input*  
Output file: *standard output*  
Time limit: 1 second  
Memory limit: 256 mebibytes

*Note the smaller memory limit.*

Yujin is playing a card game with a dealer.

The dealer has a deck of  $n$  cards, each showing either a spade (♠) or a heart (♥) on the front. The cards are initially stacked in a random order with the backs facing up. The dealer knows the front of all the cards, but Yujin does not.

Before the game starts, the dealer calls out an integer  $k$  between 1 and  $n$ . Yujin's goal is to find the  $k$ -th spade card from the top. The game proceeds as follows:

- The dealer places the cards one by one on the table, face down, in order.
- At any time, Yujin can pay the dealer one coin and shout "Stop!" (this is also possible immediately after the dealer places the last card).
- When Yujin shouts "Stop!", the dealer counts the number of spade and heart cards placed so far and tells both numbers to Yujin before continuing to place the cards.

Once the dealer has placed all the cards, they will be rearranged back into their original order. Yujin will then have one chance to guess the answer. Yujin can make one of two declarations:

- Declare that there are fewer than  $k$  spade cards in the deck.
- Point to a specific card and declare that it is the  $k$ -th spade card from the top.

If Yujin's declaration is correct, she wins; otherwise, the dealer wins.

Yujin dislikes losing, so she wants to play the game using a winning strategy that guarantees her victory in any case. For example, a strategy where Yujin shouts "Stop!" every time the dealer places a card ensures that she can always find the  $k$ -th spade card, making it a winning strategy.

Yujin has decided to use the winning strategy that requires her to pay the fewest coins. She must pay a number of coins that is less than or equal to any other winning strategy, and it can be proven that such a strategy exists.

The initial arrangement of the cards is given as input. For every value of  $k$  from 1 to  $n$ , determine how many coins Yujin will pay to the dealer using her winning strategy.

### Input

The first line contains the number of cards  $n$  ( $1 \leq n \leq 10^6$ ).

The second line contains a string of length  $n$  representing the deck of cards. The  $i$ -th character indicates the suit of the  $i$ -th card from the top, where S represents a spade and H represents a heart.

### Output

Print a single line containing  $n$  integers separated by spaces. The  $i$ -th integer represents the number of coins Yujin needs to pay to the dealer when  $k = i$ .

## Examples

<i>standard input</i>	<i>standard output</i>
10 HSHHHHHHSH	2 8 5 3 2 1 1 1 1 1
10 SSHSSHHHS	1 1 3 2 5 3 2 1 1 1
10 SSSSSSSSSS	1 1 1 1 1 1 1 1 1 1

## Note

In the first example, let us consider the case when the dealer calls  $k = 2$ .

- Yujin shouts “Stop!” after the dealer places down the 2-nd card. The dealer informs Yujin that so far, he has placed down 1 heart and 1 spade.
- After that, Yujin shouts “Stop!” every time the dealer places down the 3-rd, 4-th, ..., 9-th cards. The dealer similarly informs Yujin of the number of hearts and spades placed down.
- Once the dealer has finished organizing the cards, Yujin can guess that the 9-th card from the top is a spade.

Using the above process, Yujin will pay 8 coins to find the  $k$ -th spade card.