Problem J4: Arranging Books

Problem Description

Valentina wants books on a shelf to be arranged in a particular way. Every time she sees
a shelf of books, she rearranges the books so that all the large books appear on the left,
followed by all the medium-sized books, and then all the small books on the right. She does
this by repeatedly choosing any two books and exchanging their locations. Exchanging the
locations of two books is called a *swap*.

Help Valentina determine the fewest number of swaps needed to arrange a shelf of books as
she wishes.

Input Specification

The input will consist of exactly one line containing at least one character.

The following table shows how the available 15 marks are distributed.

7 marks	at most 1000 characters	each character will be L or S
2 marks	at most 500 000 characters	each character will be L or S
4 marks	at most 1000 characters	each character will be L, M, or S
2 marks	at most 500 000 characters	each character will be L, M, or S

Output Specification

Output a single integer which is equal to the minimum possible number of swaps needed to
arrange the books so that all occurrences of L come first, followed by all occurrences of M,
and then all occurrences of S.

Sample Input 1

LMMMS

Output for Sample Input 1

0

Explanation of Output for Sample Input 1

The books are already arranged according to Valentina's wishes.

Sample Input 2

LLSLM

Output for Sample Input 2

2

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Explanation of Output for Sample Input 2

By swapping the `S` and `M`, we end up with `LLMLS`. Then the `M` can be swapped with the `L` to its right. This is one way to use two swaps to arrange the books as Valentina wants them to be. It is not possible to use fewer swaps because both `S` and `M` need to be moved but using one swap to exchange them does not leave the books arranged as Valentina wants them to be.

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