CODECON

Memory Limit: 1024 MB
Time Limit: 5 s

Pandemic vs. WHO (900 points)

Introduction

An epidemic broke out and WHO (World Health Organization) has to quarantine the area. Can WHO quarantine the epidemic? If so, what is the minimum # of walls required to quarantine all affected areas?

The rules for the epidemic and WHO are as follows:

1. The world will be represented in a 2-D array
2. Every day, WHO sends quarantine officers ONLY to the affected area that endangers the most Safe areas (i.e. that will infect the most cells on the next turn), and installs walls surrounding that region. A single wall is used between a contaminated cell and a safe cell. If a wall is already installed from previous rounds, WHO won't need to add another wall there. *(Diagram provided in Input / Output specifications.)*
    - Note: There will never be a scenario where there will be a tie for the contaminated area with the largest number of threatened cells.
3. Every night, the epidemic spreads to all adjacent cells (North/South/East/West) UNLESS there is a wall installed to prevent the spread.

Will WHO save the world, and if so, what is the # of walls required?

Input Specifications

The first line of the input will represent the # of strings (N). The second input will represent length of the strings (M). This will be followed by N strings with M characters each ('S' or 'C' only) - where 'S' represents safe cells and 'C' represents contaminated cells.

For example :
3
9
SCSSSSSC
SCSCSSSC
SSSSSSSC
will represent the below 2-D array.

S	C	S	S	S	S	S	S	C
S	C	S	C	S	S	S	S	C
S	S	S	S	S	S	S	S	C

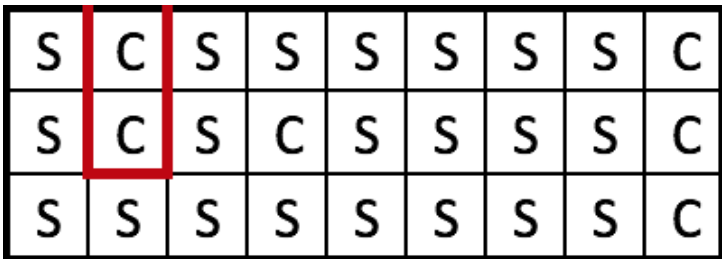
This grid represents 3 independent epidemic regions (represented as `(row,col)`):

Region 1: (1,1) + (2,1)
Region 2: (1, 3)
Region 3: (0,8) + (1,8) + (2,8)

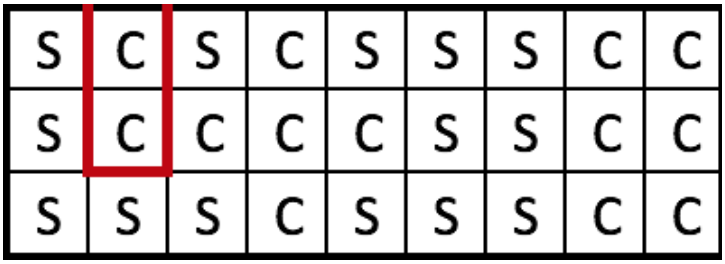
Output Specifications

Your output will be an int value indicating the # of walls used by WHO. If the world is fully contaminated, return the # of walls built by WHO so far.
For the above example, the expected output is 13

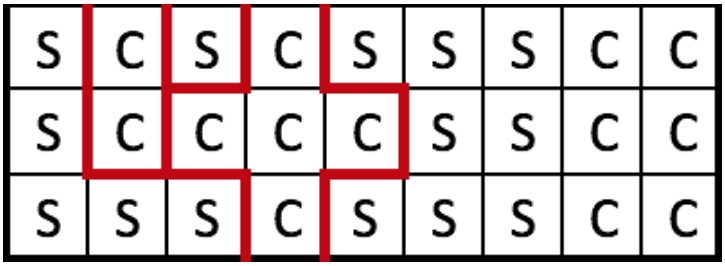
On Day 1,
WHO will quarantine Region 1 (though it is not the largest affected area, it threatens the most cells (5)) using 5 walls. Notice, WHO doesn't need to use the wall north of (0,1) since there's no cells that can be affected.



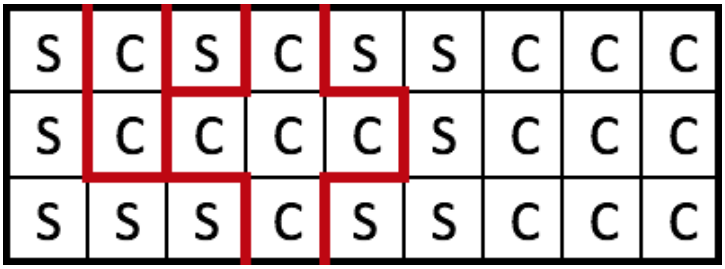
Epidemic spreads to its neighboring cells for Regions 2 & 3.



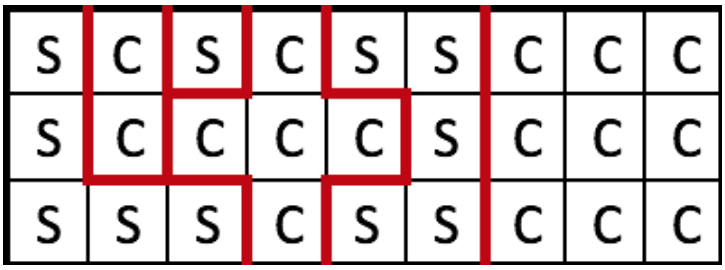
On Day 2,
WHO quarantines Region 2 (threatens 4 cells) using 9 walls. WHO used 5+9=14 walls so far. *(Note that they did not need to build a left wall for (1,2) because there was already a wall there from the first round.)*



Epidemic spreads to its neighboring cells for Region 3.



On Day 3,
WHO quarantines Region 3 with 3 additional walls. WHO used 17 walls in total.



Output: 17

Sample Input/Output

Input

3
9
SCSSSSSSC
SCSCSSSSC
SSSSSSSSC

Output

17

Explanation

As explained in Output Specifications.

Input

2
2
SC
SC

Output

2

Explanation

WHO can build 2 walls between (0,0)(0,1) and (1,0)(1,1)

Input

2
5
CCSCS
CSSCS

Output

6

Explanation

Two rounds of wall-building and we're done

Input

```
1
1
C
```

Output

```
0
```

Explanation

No wall for WHO to build

Input

```
5
5
CSCSS
SSSSS
CCCSC
SSSSC
SSSSC
```

Output

```
12
```

Explanation

A couple edge cases to consider.