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## Labyrinth

P79535\_en

Quinzè Concurs de Programació de la UPC - Semifinal (2017-06-29)

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You are given an  $R \times C$  grid. Some cells, marked with '#', have a wall. The rest of cells are free, and they are marked with '.'. There are two exceptions: one free cell is marked with 'S' (it is your starting position), and another free cell is marked with 'T' (it has a treasure).

Your goal is to reach the treasure as fast as possible. Every second, you can either move to an adjacent free cell, or hit an adjacent wall with a hammer. You know that every wall vanishes after  $H$  hits.

### Input

Input consists of several cases, each with  $R$ ,  $C$  and  $H$ , followed by  $R$  lines with  $C$  characters each. Assume that  $R$  and  $C$  are between 1 and 1000, and that  $H$  is between 1 and  $10^5$ .

### Output

For every case, print the minimum time to reach the treasure from the starting position.

#### Sample input

```
1 2 20
ST

2 3 10
S..
..T

2 3 10
S##
##T

3 3 10
T..
##.
S..

3 3 3
T..
##.
S..

4 6 100000
T##S#.
..###.
...#...
.....
```

#### Sample output

```
1
3
23
6
5
100013
```

### Problem information

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