Mirrored Laser Maze

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You have infiltrated a rectangular maze made up of empty rooms and solid walls, shown from a top-down view. You are at the room marked S, with the escape button in the room marked T. From S you may fire a laser exactly once to activate the button present at T, choosing any of the four compass directions (North, East, South, West).

As the beam travels it behaves as follows:

- It glides straight through empty rooms.
- Hitting a wall or the outer boundary absorbs the beam and ends the attempt.
- Reaching T means you have a clear path out - mission accomplished!
- Striking a mirror installed in an empty room turns the beam 90 degrees and then lets it keep going. When the beam hits a mirror, the mirror is effectively destroyed or consumed by that interaction and therefore cannot affect the beam again if the beam were to cross its path later.
    - A forward-slash mirror / transforms a north travelling beam into east. and south for west.
    - A back-slash mirror \ swaps north for west and south for east.

Your task is to arrange mirrors so the laser can travel from S to T while using as few mirrors as possible. Mirrors cannot be placed on walls, on S, or on T. If it is impossible to connect the two rooms, you must say so.

Input

Each test case input consists of two lines. The first line contains two integers R and C, representing the number of rows and columns in the maze respectively, (where 1<=R, C<=1000). Following this will be R lines, each containing a string of C characters describing a singular row of the maze. Each character will be one of the following:

- ‘.’ (period)- empty room
- ‘#’ (hash) - wall
- ‘S’ (uppercase S) - laser source (appears exactly once)
- ‘T’ (uppercase T) - target room (appears exactly once)

Output

If the maze can be solved, print a single line containing one item: the minimum number of mirrors required. If the maze cannot be solved, print a single line containing: -1

Sample Input 1

```
3 3
S..
...
..T
```

Sample Output 1

```
1
```

Explanation of Sample Case 1:

The optimal plan fires the laser east from S, placing a \ mirror at coordinates Row = 0 and Column = 1 (0 indexed, assuming S is at (0,0)).

Alternatively, we can also fire the laser south, placing a / mirror at Row= 2, Column = 0 to bend the beam east towards T. This uses one mirror too.

Sample Input 2

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

Sample Output 2

```
-1
```

Explanation of Sample Case 2:

There is no valid way to place mirrors to guide the laser from S to T due to the wall configuration and borders, which block shots in all directions.