Problem H
Common Path
Time Limit: 1 second

Given two tables a and b of the same size $m \times n$ divided into grids of m rows and n columns. Each cell of the grids contains one of four symbols:

- **"#"** represents obstacles that cannot go through.
- **"."** represents empty cell.
- **"S"** represents the starting cell. Each grid has exactly one **"S"** and the positions of the **"S"** symbol in two grids are the same (same row and same column).
- **"F"** represents the final cell. Each grid has exactly one **"F"** and the positions of the **"F"** symbol in two grids are the same (same row and same column).

A robot needs to move from cell **"S"** to cell **"F"** in both grids. The robot in one cell can move in four directions: up, down, left, and right. It cannot move out of the grid as well as move into the obstacle cells **"#"**.

Find a path from cell **"S"** to cell **"F"** so that it is the **shortest** and **valid** path in both grids.

Input

The first line contains two integers m, n ($2 \le m, n \le 10^3$).

Each line in the next m lines contains a string of length n describing the a row of grid a.

Each line in the next m lines contains a string of length n describing the a row of grid b.

Output

Print the length of the result path (the number of cell in the path, excluding cell "S" and "F"). If there is no satisfactory path, print `-1`.

Sample Input	Sample Output
3 4 S.## #..# #.F. S.## #.## #.F.	3

Explanation:

There are two shortest paths from **"S"** to **"F"** in a : $\{(1,1),(1,2),(2,2),(3,2),(3,3)\}$ and $\{(1,1),(1,2),(2,2),(2,3),(3,3)\}$.

There is only one shortest path from **"S"** to **"F"** in b: $\{(1,1),(1,2),(2,2),(3,2),(3,3)\}$.

Therefore, the final path is $\{(1,1),(1,2),(2,2),(3,2),(3,3)\}$ with the length of 3 (excluding the first and last cell).