4 They Delved Too Greedily and Too Deep

There’s a new Lord of the Rings show out, have you watched it? It may not surprise you to
learn that I started the first episode the day I wrote this problem.

You and your party of dwarves are exploring a new mountain to share. You find a complex
cave system, with many walled off pockets, nooks, and crannies. After getting a good idea of the
layout, you decide to each pick an area to call your own, provided that it is completely walled
off from all of the other party members’ areas.

Since you found the cave, you are allowed first pick. However, you are a bit greedy, and you
want to pick the section with the largest area. You aren’t above a little cheating and plan to
extend your area by knocking down a wall (so that then your section absorbs all of the system
on the other side of the wall as well).

Your job is to find the area of the largest contiguous area that can be formed by knocking
down exactly one wall in the cave. Note that spaces are only considered adjacent if they are
to the touching to the north, south, east, or west. Spaces that are touching corners (diagonally
adjacent) are not considered adjacent. You are not allowed to move outside of the cave system.

In the cave, ‘.’ denotes empty spaces and ‘#’ denotes walls.

4.1 Example

Here, the largest area that can be formed is 23, which is formed by knocking down the wall
marked ‘@’, since you now have access to the two contiguous areas on the left and right of the
‘@’ and the ‘@’ space itself.
4.2 Input
The first line of input will be two integers, $5 \leq R, C \leq 1000$, separated by a single whitespace, corresponding the number of rows and columns in the input, respectively.

The next $R$ rows will each contain $C$ characters: '.', corresponding to empty space and '#', corresponding to a cave wall.

You can assume that there will be at least one '#' and at least two '.' in every problem.

4.3 Output
Your output should be one integer, $A$, corresponding to the largest contiguous area (counted as the number of empty spaces) that can be formed by the removal of one '#' (turning it into a '.').

4.4 Sample Input/Output

<table>
<thead>
<tr>
<th>Sample Input</th>
<th>Sample Output</th>
</tr>
</thead>
</table>
| 9 10
##..##.#.. 
#.####..##.
#.##.#..#.
#...######
#...#.#.##
##..#####.
#..##..#..
...#...##.
#.##..#...
#..##..##...| 23            |