

Problem M : Stabbing Number

A histogram is a simple rectilinear polygon H (i.e. the interior angle at each vertex is either 90° or 270°) that has a horizontal edge seeing every point q inside (i.e. the interior or the boundary of) H . Here, we say that an edge sees a point $q \in H$ if there is a vertical segment s connecting e to q that is lying inside H .

Let H be a histogram with n vertices, and consider a decomposition R of H into rectangles whose sides are vertical or horizontal. The vertices of the rectangles need not all be vertices of H : it is allowed to introduce additional vertices, on the boundary of H and/or in its interior. The stabbing number of a horizontal or vertical segment s inside H with respect to such a decomposition R is the number of rectangles from R whose interior (not just their boundaries) are intersected by s . The stabbing number of R is the maximum stabbing number of any horizontal or vertical segment s that lies inside H . The goal is to compute a decomposition R with the minimum stabbing number.

Input

The first line of the input contains two positive integers m and n ($1 \leq m, n \leq 50$) denoting the number of rows and the number of columns of the table illustrating the histogram, respectively. The next m lines, each contains exactly n characters. “*”s denote the boundary of the histogram. The rest is filled with dots (“.”). Each edge of the histogram contains at least three “*”s. You can assume the given histogram has at least four and at most 16 edges, and edges do not overlap, intersect or touch each other; i.e. each “*” is adjacent to exactly two other “*” characters.

Output

Print the stabbing number of the given histogram in one line.

Example

Standard Input	Standard Output
<pre> 10 13****.*..*...*..***.*...*..*...*** ...***.....* ...*.....* ****.....* *.....* ***** </pre>	<p>2</p>



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Standard Input	Standard Output
<pre> 8 15*****.***.*...*.*.*.*...*.*****.*. .*.....*.*****. </pre>	<pre> 2 </pre>