

## Problem M : Stabbing Number

A histogram is a simple rectilinear polygon  $H$  (i.e. the interior angle at each vertex is either  $90^\circ$  or  $270^\circ$ ) 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>	<pre> 2 </pre>

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