

Problem I

Crown Shyness

Time limit: 5 seconds

Buenos Aires, Argentina

Crown shyness is a phenomenon where trees avoid touching each other. After a lovely visit to Plaza San Martín in Buenos Aires, the newly-formed Herbal Shyness Planning Committee (HSPC) has been inspired to plant a garden of eucalyptus trees to demonstrate this principle.

The garden layout can be represented as a finite, two-dimensional grid. Initially at time $t = 0$, trees start out as seedlings that occupy only one cell. At every time t , the trees grow. If some cell adjacent to some tree does not already contain a tree and is not adjacent to any other trees, that tree will expand into that cell at time $t + 1$.



Trees in Plaza San Martín in Buenos Aires
By Dag Peak - Flickr, CC BY 2.0, acquired from Wikimedia Commons.

The HSPC would like to know: at time $t = 10^{2025}$, what is the total *leaf exposure* of all trees? The leaf exposure of a tree is the number of cell boundaries adjacent to exactly one cell containing that tree.

Trees cannot expand past the boundary of the grid, but cell boundaries on the boundary of the grid do count for leaf exposure calculations.

Input

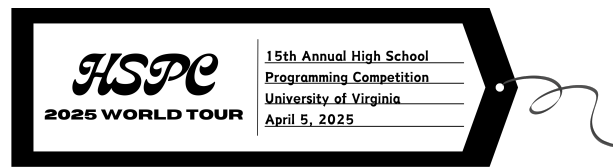
On the first line are two integers h, w , the height and width of the garden ($1 \leq h, w \leq 100\,000, w \cdot h \leq 100\,000$).

The following h lines consist of w characters describing the state of the garden at time $t = 0$. An empty cell is written with a single E, while a cell containing a seed is written with a single S.

Output

On one line, print the total leaf exposure of all trees at time $t = 10^{2025}$.

| Sample Input 1 | Sample Output 1 |
|----------------------|-----------------|
| <pre>2 2 SS EE</pre> | <pre>12</pre> |
| Sample Input 2 | Sample Output 2 |
| <pre>2 2 SE ES</pre> | <pre>8</pre> |



Sample Input 3

```
3 7
EEEEEE
SEEEEE
EEEEEE
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Sample Output 3

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24
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