3721 Islands

The ideal holiday for many people involves being on the white sand of a sunny beach on a tropical island, drinking cocktails under the palm trees and swimming, snorkelling and diving in the clear blue waves. The Algorithmic Archipelago is the ideal place for such a holiday as it consists of countless beautiful islands. Since many tourists spend their holidays (and money) on these islands, you decided to enter the tourism industry and buy an island. The cost of an island is proportional to its area, but the number of tourists that visit an island is proportional to the length of its beaches, i.e., the perimeter of the island. Your task is to select the island where the profit per investment ratio is the highest: where the ratio of the perimeter and the area is maximum. Out of curiosity, you would like the determine the minimum of this ratio aswell.

In the input you are given the map of the archipelago as an $n \times n$ matrix. Each cell contains either water or land. An island is a connected area of land.

- Two cells sharing only a corner are not considered to be neighbours. (Therefore, there are 3 islands in the sample input).
- It can happen that an island contains one or more lakes. The perimeter of these lakes also contribute to the perimeter of the island.
- It can happen that the lake on an island contains further islands. These are considered to be separate islands, and the area of these islands does not contribute to the area of the island containing them.
- We assume that there is water in the area outside the map.

Input

The input contains several blocks of test cases. Each case begins with a line containing a single integer $1 \leq n \leq 400$, the size of the map. This is followed by n lines, each containing n characters. Character '`.`' means water and character '`X`' means land. It can be assumed that the map contains not only water. The input is terminated by a test case with $n = 0$.

Output

For each test case, you have to output a line containing two real numbers, separated by a space: the maximum and the minimum of the ratio of the perimeter and the area. To avoid rounding problems, we accept solutions with a maximum of ± 0.001 error.

Sample Input

```
8
....XXXX
.XXX.XXX
XX.XX...
XX...XX.
X.XXX.XX
X.XXX.XX
X....XX.
```

```
XXXXXX..
0
```

Sample Output

```
1.923 1.66613
```