DMPG '16 G2 - Kabane Apocalypse

The world is in turmoil, undead zombies are roaming the Earth, and there's no time for a fancy legend. You are in charge of planning where to develop a human stronghold to fight back against the zombies.

You know there are 5 essential things humanity needs to establish a stronghold: food, water, ammunition, building supplies, and a power source. For simplicity, we will assign a letter from A to E to represent each of these essentials, in that order. Since it's well known that the world is square and flat, you can view it as a 2 dimensional grid of N rows of N cells each. Each cell may be empty, or it may contain one of the essentials for a stronghold.

The human stronghold should be located in an axis-aligned sub-grid of the original grid that contains at least one of each of the five essentials. How many ways can you choose a sub-grid such that each of the five essentials appear at least once in it?

Input Specification

The first line of input will contain N.
The next N lines of input will contain N characters each, each one either an uppercase letter from 'A' to 'E' or a period ('.'). Letters represent that the cell contains the one of the five essentials that is represented by the letter, and a period represents that none of the five essentials is present in that cell.

Output Specification

Output the number of ways to choose a sub-grid for the human stronghold.

Constraints

For all subtasks,
$1 \leq N \leq 1\,000$

[Subtask 1 - 15%]

$1 \leq N \leq 20$

[Subtask 2 - 15%]

Each of the five essentials will appear only once in the grid.

[Subtask 3 - 70%]

No additional constraints.

Sample Input

```
4
.A.E
..D.
.CB.
E..A
```

Sample Output

```
6
```