Rotating Mugs

Problem ID: rotatingmugs

At Lovables office, they have some really cool coffee mugs. Even though the mugs are so cool, we will model the mug as a simple object with 4 sides, 'North', 'West', 'South', 'East'.

You have M mugs indexed from 0 to $M-1$ infront of you, and you are now tasked with transforming the mugs infront of you such that the 'North' side is faced towards you. However, whoever gave you task allowed you to only do *Magical Rotations*. A Magical Rotation consists of the following 3 steps:

1. Pick an integer a $(0 \leq a < M)$, and another integer b $(0 \leq b < M-1)$, where $a \neq b$. Note that b cannot be the last index.
2. Switch the two mugs positioned at index a and index b without rotating any of them.
3. Finish by taking the mug that was at index a and the mug now to the right of it, and rotate both by 90 degrees.

When rotating a mug 90 degrees,

- A mug with 'North' side facing you now has its 'West' side facing you.
- A mug with 'West' side facing you now has its 'South' side facing you.
- A mug with 'South' side facing you now has its 'East' side facing you.
- A mug with 'East' side facing you now has its 'North' side facing you.

You wonder if it even is possible to rotate all the mugs infront of you such that the 'North' side is faced towards you by only using Magiacal Rotations. To impress whoever gave you this task, you would like to use as few Magical Rotations as possible.

Input

The first line contains one integer M $(2 \leq M \leq 5 \cdot 10^5)$, the number of cups infront of you.

The second line contains a string of M characters $c_1, c_2, \ldots, c_M$ $(c_i \in \{\text{"}N\text{"}, \text{"}W\text{"}, \text{"}S\text{"}, \text{"}E\text{"}\})$, the character representing the current side of the mug that is faced towards you.

Output

Print one integer, the minimum number of Magical Rotations such that all mugs has the 'North' side faced towards you. If it is impossible, print -1.

Scoring

Your solution will be tested on a set of test groups, each worth a number of points. Each test group contains a set of test cases. To get the points for a test group you need to solve all test cases in the test group.

Group	Points	Constraints
1	15	From the start, all mugs either have their 'North' or 'East' side facing you.
2	25	$M \leq 100$
3	60	No additional constraints.

Sample Input 1

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4
1 5 7 9
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Sample Output 1

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3
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Sample Input 2	Sample Output 2
1 987654321	1