Problem H: Theseus and the Minotaur

Allegedly, Theseus killed the Minotaur. Also allegedly, Ariadne assisted Theseus by giving him a ball of thread, to help him navigate his way back out of the Labyrinth.

But threads are notoriously unreliable contraptions and, in this day and age, it is possible to use more dependable methods for that purpose. Since the depth at which the labyrinth is located prevents accessing the GPS network, a solution is to use a device that records Theseus' steps on his way to meet the Minotaur, and which will then allow him to retrace them back to the entrance of the labyrinth.

Task

Given the sequence of steps taken by Theseus until he found the Minotaur, your task is to compute the minimum number of steps it will take Theseus to get back to the location from where he started. Note that, having drunk a full keg of hydromel to foster his courage before venturing into the Labyrinth, allegedly, Theseus began by losing the ball of thread and then wandered through the maze haphazardly, rather than systematically, possibly crossing his own path multiple times before coming face to face with the Minotaur.

Each of Theseus' steps is given by its direction, which may be one of North, East, South, and West. The four directions have their usual meaning and the geometry of the space is the normal one: North and South are opposite directions, as are East and West. If it is possible to move from one location to another by taking a step in some direction, then it is possible to move from the latter location to the former by taking a step in the opposite direction. All steps have the same length and if Theseus takes one step North, followed by one step East, one step South, and one step West, he ends up back in the location where he started.

Every step Theseus takes on his way back must correspond to a step he took on his way in, in either the same or the opposite direction.

Input

The input of the program consists of a line with a positive integer M, followed by M lines showing the K steps Theseus took from where he started to where he met the Minotaur, in order. The initial and final locations of his path may be any two locations in the labyrinth. Each step is identified by one of the characters `N`, `E`, `S`, or `W`, corresponding to the initial of the direction in which the step was taken.

All lines of input with Theseus' steps have length L except, possibly, the last line, which may have between 1 and L characters.

Constraints

$1 \leq K \leq 250\,000$	Number of steps
$L = 80$	Maximum number of steps on a line

Output

The output consists of a single line with the minimum number of steps it takes to go back from the location Theseus ended in to the location from where he started.

Sample Input 1

```
1
NNEEEENWNENNSEEEWWWSWSESWWWNNNNWWWSSNNNNEE
```

Sample Output 1

```
14
```

Sample Input 2

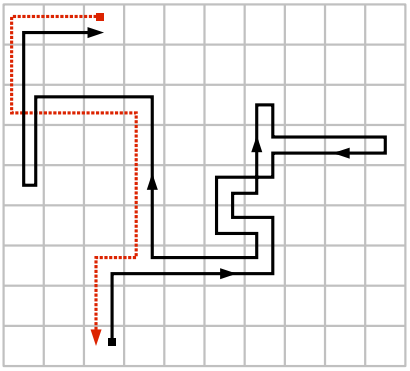
```
1
NEEENNWWWSSWNNEN
```

Sample Output 2

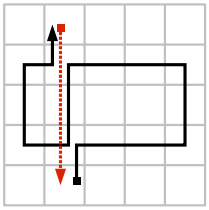
```
4
```

Explanation

Sample 1



Sample 2



Theseus' route.
Shortest path to starting location.