

Lab 9C

Problem 1: Xenia and Ringroad

In the whimsical city of Circleton, there exists a peculiar neighborhood known as Ring Road, where houses are arranged in a perfect circle. The city planners, in their infinite wisdom (or perhaps their love for traffic simplicity), designed the road to be one-way only - clockwise, always clockwise.

Enter Xenia, a spirited young woman who just moved into house number 1. Like any newcomer eager to integrate into their community, she's determined to meet all her neighbors. However, Ring Road has its own unique customs and challenges:

The neighborhood association, known for their love of order and tradition, has provided Xenia with a specific sequence in which she must meet her neighbors. It's not enough to simply wave as she passes by - each meeting must be a proper visit, entering each house in turn. Adding to the complexity, the association insists that before meeting any neighbor on the list, she must have already met everyone earlier in the sequence.

Making things more interesting, the city's one-way traffic rule means Xenia can only travel clockwise along Ring Road. Sometimes, this means passing the same houses multiple times to reach her next destination. "Time waits for no one," the locals always say, and Xenia, being the efficient person she is, wants to complete her neighborhood tour as quickly as possible.

Given her starting point at house number 1 and knowing it takes exactly one minute to travel between adjacent houses, can you help Xenia figure out the minimum time she'll need to meet all her neighbors according to the association's strict requirements?

Input

In input.txt file, first line contains n integers ($2 \leq n \leq 10^6$), representing the order in which Xenia must visit the houses. These numbers form a permutation of $[1...n]$

Output

Print a single integer — the minimum time in minutes Xenia needs to complete her neighborhood tour.

Examples

Input

2 3 5 4 1

Output

10

Example Explained: In this case, Xenia must travel: $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 1$, taking exactly 10 minutes to complete her neighborhood tour according to the association's requirements.

Note

Time limit per test: 2 seconds

Memory limit per test: 256 megabytes

Problem 2: Student Marks Adjustment

You've found a file called `data.txt` that contains the academic records of you and your friends. You noticed that your marks aren't as good as you hoped, and neither are your friends' marks. You decided to help everyone by slightly modifying the lowest mark in each of their records.

Here's what you decided to do:

- Find the lowest mark in the records for yourself and your friends.
- Replace the lowest mark with the average of the other three marks.
- Backup the original records into a file called `backup.txt` before making any changes.
- Save the updated records into the original file, `data.txt`.

Use structs to represent the student records.

Input

The input will consist of the following: - The first line contains an integer, `n`, representing the

number of friends (including yourself). - The next n lines contains roll numbers of the students whose records need to be modified. The file **data.txt** contains student records in the following format:

```
RollNumber Name Marks1 Marks2 Marks3 Marks4
```

Output

After performing the necessary modifications, the program should: Create a backup of the original records in the file **backup.txt**.

Save the modified student records back into **data.txt**.

Example

Content of data.txt

```
101 John 80 70 60 90
102 Alex 75 80 65 85
103 Mark 90 70 80 75
```

Input

```
1
101
```

Output

Content of backup.txt

```
101 John 80 70 60 90
102 Alex 75 80 65 85
103 Mark 90 70 80 75
```

Content of data.txt

```
101 John 80 70 80 90
102 Alex 75 80 65 85
103 Mark 90 70 80 75
```

Note

In this example, the lowest marks for each student are replaced with the average of the other three marks. For instance, John had the marks 80, 70, 60, and 90; the lowest mark is 60, and it's replaced with the average of 80, 70, and 90, which is 70.

