ECE30018 Problem Solving Studio, Fall 2023

P2. Underwater Cable

| Submission due: 7:00 PM, 19 Sep Tue

Underwater Cable

Due to an earthquake, an underwater cable for Internet was broken down and split into N segments such that the length of the i-th segment is s_i kilometers. They are lying in sequence on the underwater surface.

You are planning to use an underwater welding robot to re-join all segments into one to recover the Internet connection. The robot performs electrical welding of two adjacent segments at a time, which takes a neglectable amount of time. Yet, after each welding operation, the robot must check along the whole joined segments whether any defect was introduced due to high voltage electric shock. After joining p kilometers and q kilometers segments, the robot takes $(p + q)$ hours to finish the defect-checking operations.

Write a program that finds the minimum required time in hours for the robot to accomplish rejoining the whole segments into one and completing the defect checking.

Requirements

Input. The input data is given to the standard input. The first line has a positive integer N for $3 \leq N \leq 500$, which indicates the number of cable segments. The following line contains a sequence of N positive integers delimitated by whitespace, that indicate the lengths N segments in kilometer. The length of a segment does not exceed 10000.

Output. Print out the solution to the standard output.

Example 1

Input file

```
4
3 4 4 2
```

Output file

```
26
```

Example 2

Input file

```
12
1 20 35 5 4 3 5 92 23 14 32 18
```

Output file

```
771
```