DMOPC '18 Contest 4 P2 - Dr. Henri and Responsibility

Time limit: 1.0s (Python: 2.5s) **Memory limit:** 64M (Python: 128M)

Dr. Henri is a very busy person. He has N responsibilities to attend to over the next two days. Being a very organized person, he wants to split the tasks evenly between the two days. More specifically, if the tasks on day 1 take t_1 seconds, and the tasks on day 2 take t_2 seconds, he wants to minimize the value of $|t_1 - t_2|$.

The i^{th} task takes him A_i seconds, and **must be completed within a single day**. Dr. Henri, being very busy with these tasks, then asks you: what is the minimum value of $|t_1 - t_2|$ if he partitions his tasks optimally?

Constraints

$0 \leq A_i \leq 700$

Subtask 1 [20%]

$1 \leq N \leq 20$

Subtask 2 [80%]

$1 \leq N \leq 700$

Input Specification

The first line of input will contain a single integer, N.
The next and final line of input will contain N space separated integers: $A_1, A_2, \ldots, A_N$.

Output Specification

Output the minimum value of $|t_1 - t_2|$ if Dr. Henri partitions the tasks optimally.

Sample Input

```
6
4 2 3 1 1 1
```

Sample Output

```
0
```

Explanation for Sample Output

If he partitions the task as $\{2, 3, 1\}$ and $\{4, 1, 1\}$, they both sum to 6, and thus the difference is 0.