Chocolate Bar

Angus and Kevin are very excited to share a tasty chocolate bar. The bar is divided into N sections, numbered $1, 2, \ldots, N$ from left to right. The ith section has a *tastiness* of a_i, which may be negative.

Angus and Kevin will share the chocolate bar by breaking it into **exactly two pieces**. They feel it would be fairest if the absolute difference in the total tastiness of the two pieces is as small as possible. What is the minimum absolute difference achievable?

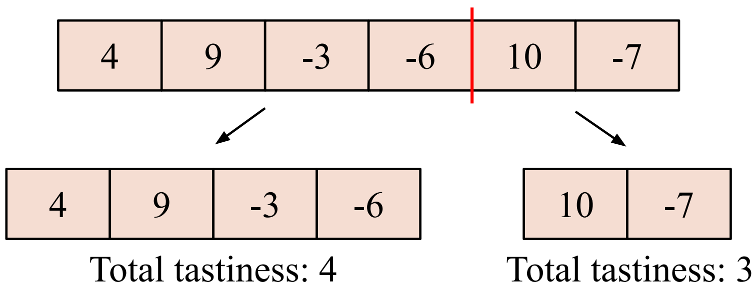

Figure 1: Sample Input 1

Subtasks and Constraints

For all subtasks:

- $2 \le N \le 100\,000$.
- $-10\,000 \le a_i \le 10\,000$ for all i.

Additional constraints for each subtask are given below.

Subtask	Points	Additional constraints
1	40	$N \le 2000$
2	30	$a_i > 0$ for all i
3	30	No additional constraints.

Input

- The first line of input contains the integer N.
- The second line contains N integers $a_1, a_2, \ldots, a_N$.

Output

Output a single integer, the minimum absolute difference achievable.

Sample Input 1

```
6
4 9 -3 -6 10 -7
```

Sample Output 1

```
1
```

Sample Input 2

```
7
5 -2 1 -1 -40 -2 12
```

Sample Output 2

```
33
```

Sample Input 3

```
4
10 20 0 -100
```

Sample Output 3

```
90
```

Explanation

In Sample Input 1, Angus and Kevin can break the bar into `[4 9 -3 -6]` and `[10 -7]`. The total tastiness is $4 + 9 - 3 - 6 = 4$ and $10 - 7 = 3$ respectively, for an absolute difference of $|4 - 3| = 1$.

In Sample Input 2, Angus and Kevin can break the bar into `[5 -2]` and `[1 -1 -40 -2 12]`. The total tastiness is $5 - 2 = 3$ and $1 - 1 - 40 - 2 + 12 = -30$ respectively, for an absolute difference of $|3 - (-30)| = 33$.

In Sample Input 3, Angus and Kevin can break the bar into `[10]` and `[20 0 -100]`. The total tastiness is $10 = 10$ and $20+0-100 = -80$ respectively, for an absolute difference of $|10-(-80)| = 90$.