

Problem K

Emma's Array Balancing Challenge

Time limit: 1 second
Memory limit: 512 megabytes

Emma is a data analyst working for a tech startup that specializes in creating balanced datasets for machine learning applications. Her company has developed a revolutionary algorithm that requires perfectly balanced numerical arrays to function optimally.

Emma has an array $[a_0, a_1, a_2, \dots, a_{n-1}]$ of size n where n is an even number representing critical sensor data from IoT devices. An array is balanced if the sum of the left half of the array elements is equal to the sum of right half - what her team calls "*balanced arrays*."

For example:

- **Balanced Array:** $[1, 2, 5, 2, 4, 2]$ where left half sum $= 1 + 2 + 5 = 8$ and right half sum $= 2 + 4 + 2 = 8$
- **Unbalanced Array:** $[1, 2, 1, 2, 1, 3]$ where left half sum $= 1 + 2 + 1 = 4$ and right half sum $= 2 + 1 + 3 = 6$

Unfortunately, the raw sensor data rarely comes in balanced form. Emma has discovered that she can fix unbalanced arrays by adding non-negative values to any elements in the array. However, her company wants to minimize data modification to preserve the integrity of the original sensor readings.

To balance an array, Emma can increase exactly one element a_i by a non-negative integer x . Your task is to help Emma find the smallest value of x that makes the array balanced, ensuring the AI algorithm can process the data while maintaining maximum data authenticity.

Input

The first line contains an even integer n .

The second line contains the n integer elements of the array $a_0, a_1, a_2, \dots, a_{n-1}$.

Constraints

- $1 \leq n \leq 100000$
- $0 \leq a_i \leq 1000$
- n is an even number.

Output

Print the minimum value of x on a single line.

Sample Input	Sample Output
6 1 2 1 2 1 3	2

Explanation

To balance the array, Emma needs to add 2 to a_2 : For example:

- Adding 2 to a_2 : $[1, 2, 3, 2, 1, 3]$ gives left sum $= 1 + 2 + 3 = 6$ and right sum $= 2 + 1 + 3 = 6$

The array is now balanced with minimum addition of $x = 2$.