

Task Name

Center Balance Index 1

Difficulty

Easy

Problem Description

Find the leftmost index where the sum of values on the left equals the sum of values on the right.

Problem Statement

You are given an array of n integers.

An index i is called a center balance index if: - the sum of all elements strictly to the left of i is equal to - the sum of all elements strictly to the right of i

If i is at the left edge, then the left sum is 0. If i is at the right edge, then the right sum is 0.

Find the leftmost center balance index, or print -1 if no such index exists.

Input Format

- The first line contains a single integer n .
- The second line contains n space-separated integers.

Constraints

- $1 \leq n \leq 10^4$
- $-1000 \leq a[i] \leq 1000$

Output Format

Print one integer: the leftmost center balance index, or -1 if none exists.

Example 1

Input

6 1 7 3 6 5 6

Output

3

Explanation

At index 3: - left sum = $1 + 7 + 3 = 11$ - right sum = $5 + 6 = 11$

Example 2

Input

3 1 2 3

Output

-1

Explanation

There is no index where the left sum equals the right sum.

Tags

Arrays, Prefix Sums

Reference Solution Idea

Let **right** be the total sum of the array and **left** = 0. Scan the array from left to right. For each index: - remove the current value from **right** - if **left** == **right**, this is the answer - otherwise add the current value to **left**

Complexity

- Time: $O(n)$
- Space: $O(1)$ extra space

Suggested testcase roles

- input00/output00 -> Sample, strength 0
- input01/output01 -> Sample, strength 0
- input02/output02 -> Hidden, strength 34
- input03/output03 -> Hidden, strength 33
- input04/output04 -> Hidden, strength 33