3776. Minimum Moves to Balance Circular Array

Solved ●

Medium   🏷 Topics   📑   📍 Hint

You are given a **circular** array `balance` of length `n`, where `balance[i]` is the net balance of person `i`.

In one move, a person can transfer **exactly** 1 unit of balance to either their left or right neighbor.

Return the **minimum** number of moves required so that every person has a **non-negative** balance. If it is impossible, return `-1`.

Note: You are guaranteed that **at most** 1 index has a **negative** balance initially.

Example 1:

Input: balance = [5,1,-4]

Output: 4

Explanation:

One optimal sequence of moves is:

- Move 1 unit from `i = 1` to `i = 2`, resulting in `balance = [5, 0, -3]`
- Move 1 unit from `i = 0` to `i = 2`, resulting in `balance = [4, 0, -2]`
- Move 1 unit from `i = 0` to `i = 2`, resulting in `balance = [3, 0, -1]`
- Move 1 unit from `i = 0` to `i = 2`, resulting in `balance = [2, 0, 0]`

Thus, the minimum number of moves required is 4.

Example 2:

Input: balance = [1,2,-5,2]

Output: 6

Explanation:

One optimal sequence of moves is:

- Move 1 unit from `i = 1` to `i = 2`, resulting in `balance = [1, 1, -4, 2]`
- Move 1 unit from `i = 1` to `i = 2`, resulting in `balance = [1, 0, -3, 2]`
- Move 1 unit from `i = 3` to `i = 2`, resulting in `balance = [1, 0, -2, 1]`
- Move 1 unit from `i = 3` to `i = 2`, resulting in `balance = [1, 0, -1, 0]`
- Move 1 unit from `i = 0` to `i = 1`, resulting in `balance = [0, 1, -1, 0]`
- Move 1 unit from `i = 1` to `i = 2`, resulting in `balance = [0, 0, 0, 0]`

Thus, the minimum number of moves required is 6.

Example 3:

Input: balance = [-3,2]

Output: -1

Explanation:

It is impossible to make all balances non-negative for `balance = [-3, 2]`, so the answer is -1.

Constraints:

- `1 <= n == balance.length <= 10^5`
- `-10^9 <= balance[i] <= 10^9`
- There is at most one negative value in `balance` initially.

Seen this question in a real interview before?   1/5

Yes   No

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Topics   ⌄

凸   ⌄

Hint 1   ⌄

Hint 2   ⌄

Hint 3   ⌄

Discussion (49)   ⌄

凸   ⌄