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2208. Minimum Operations to Halve Array Sum

Medium

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You are given an array `nums` of positive integers. In one operation, you can choose **any** number from `nums` and reduce it to **exactly** half the number. (Note that you may choose this reduced number in future operations.)

Return the *minimum* number of operations to reduce the sum of `nums` by **at least** half.

Example 1:

Input: `nums = [5,19,8,1]`

Output: 3

Explanation: The initial sum of `nums` is equal to $5 + 19 + 8 + 1 = 33$.
The following is one of the ways to reduce the sum by at least half:
Pick the number 19 and reduce it to 9.5.
Pick the number 9.5 and reduce it to 4.75.
Pick the number 8 and reduce it to 4.
The final array is `[5, 4.75, 4, 1]` with a total sum of $5 + 4.75 + 4 + 1 = 14.75$.
The sum of `nums` has been reduced by $33 - 14.75 = 18.25$, which is at least half of the initial sum, $18.25 \geq 33/2 = 16.5$.
Overall, 3 operations were used so we return 3.
It can be shown that we cannot reduce the sum by at least half in less than 3 operations.

Example 2:

Input: `nums = [3,8,20]`

Output: 3

Explanation: The initial sum of `nums` is equal to $3 + 8 + 20 = 31$.
The following is one of the ways to reduce the sum by at least half:
Pick the number 20 and reduce it to 10.
Pick the number 10 and reduce it to 5.
Pick the number 3 and reduce it to 1.5.
The final array is `[1.5, 8, 5]` with a total sum of $1.5 + 8 + 5 = 14.5$.
The sum of `nums` has been reduced by $31 - 14.5 = 16.5$, which is at least half of the initial sum, $16.5 \geq 31/2 = 16.5$.
Overall, 3 operations were used so we return 3.
It can be shown that we cannot reduce the sum by at least half in less than 3 operations.

Constraints:

- $1 \leq \text{nums.length} \leq 10^5$
- $1 \leq \text{nums}[i] \leq 10^7$

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1

class Solution {

2

public int halveArray(int[] nums) {

3

4

}

5

}

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