

2002. Stone Game VIII

Difficulty : Hard

<https://leetcode.com/problems/stone-game-viii>

Alice and Bob take turns playing a game, with **Alice starting first**.

There are n stones arranged in a row. On each player's turn, while the number of stones is **more than one**, they will do the following:

1. Choose an integer $x > 1$, and **remove** the leftmost x stones from the row.
2. Add the **sum** of the **removed** stones' values to the player's score.
3. Place a **new stone**, whose value is equal to that sum, on the left side of the row.

The game stops when **only one** stone is left in the row.

The **score difference** between Alice and Bob is (Alice's score - Bob's score). Alice's goal is to **maximize** the score difference, and Bob's goal is the **minimize** the score difference.

Given an integer array `stones` of length n where `stones[i]` represents the value of the i^{th} stone **from the left**, return *the score difference between Alice and Bob if they both play **optimally***.

Example 1:

Input: `stones = [-1,2,-3,4,-5]`

Output: 5

Explanation:

- Alice removes the first 4 stones, adds $(-1) + 2 + (-3) + 4 = 2$ to her score, and places a stone of value 2 on the left. `stones = [2,-5]`.
- Bob removes the first 2 stones, adds $2 + (-5) = -3$ to his score, and places a stone of value -3 on the left. `stones = [-3]`.

The difference between their scores is $2 - (-3) = 5$.

Example 2:

Input: `stones = [7,-6,5,10,5,-2,-6]`

Output: 13

Explanation:

- Alice removes all stones, adds $7 + (-6) + 5 + 10 + 5 + (-2) + (-6) = 13$ to her score, and places a stone of value 13 on the left. `stones = [13]`.

The difference between their scores is $13 - 0 = 13$.

Example 3:

Input: `stones = [-10,-12]`

Output: -22

Explanation:

- Alice can only make one move, which is to remove both stones. She adds $(-10) + (-12) = -22$ to her score and places a stone of value -22 on the left. `stones = [-22]`.

The difference between their scores is $(-22) - 0 = -22$.

Constraints:

- $n == \text{stones.length}$
- $2 \leq n \leq 10^5$
- $-10^4 \leq \text{stones}[i] \leq 10^4$