

Sum of Subarray Ranges

You are given an integer array `nums`. The **range** of a subarray of `nums` is the difference between the largest and smallest element in the subarray.

Return *the sum of all subarray ranges* of `nums`.

A subarray is a contiguous **non-empty** sequence of elements within an array.

Example 1:

Input: `nums = [1,2,3]`

Output: 4

Explanation: The 6 subarrays of `nums` are the following:

`[1]`, range = largest - smallest = $1 - 1 = 0$

`[2]`, range = $2 - 2 = 0$

`[3]`, range = $3 - 3 = 0$

`[1,2]`, range = $2 - 1 = 1$

`[2,3]`, range = $3 - 2 = 1$

`[1,2,3]`, range = $3 - 1 = 2$

So the sum of all ranges is $0 + 0 + 0 + 1 + 1 + 2 = 4$.

Example 2:

Input: `nums = [1,3,3]`

Output: 4

Explanation: The 6 subarrays of `nums` are the following:

`[1]`, range = largest - smallest = $1 - 1 = 0$

`[3]`, range = $3 - 3 = 0$

`[3]`, range = $3 - 3 = 0$

`[1,3]`, range = $3 - 1 = 2$

`[3,3]`, range = $3 - 3 = 0$

`[1,3,3]`, range = $3 - 1 = 2$

So the sum of all ranges is $0 + 0 + 0 + 2 + 0 + 2 = 4$.

Example 3:

Input: nums = [4,-2,-3,4,1]

Output: 59

Explanation: The sum of all subarray ranges of nums is 59.

Constraints:

- $1 \leq \text{nums.length} \leq 1000$
- $-10^9 \leq \text{nums}[i] \leq 10^9$