Problem 1770: Maximum Score from Performing Multiplication Operations

Problem Information

Difficulty: Hard
Acceptance Rate: 42.85%
Paid Only: No
Tags: Array, Dynamic Programming

Problem Description

You are given two **0-indexed** integer arrays `nums` and `multipliers`**** of size `n` and `m` respectively, where `n >= m`.

You begin with a score of `0`. You want to perform **exactly** `m` operations. On the `ith` operation (**0-indexed**) you will:

* Choose one integer `x` from **either the start or the end** of the array `nums`. * Add `multipliers[i] * x` to your score. * Note that `multipliers[0]` corresponds to the first operation, `multipliers[1]` to the second operation, and so on. * Remove `x` from `nums`.

Return _the**maximum** score after performing _`m` _operations._

Example 1:

Input: nums = [1,2,3], multipliers = [3,2,1] **Output:** 14 **Explanation:** An optimal solution is as follows: - Choose from the end, [1,2,**_3_**], adding 3 * 3 = 9 to the score. - Choose from the end, [1,**_2_**], adding 2 * 2 = 4 to the score. - Choose from the end, [**_1_**], adding 1 * 1 = 1 to the score. The total score is 9 + 4 + 1 = 14.

Example 2:

Input: nums = [-5,-3,-3,-2,7,1], multipliers = [-10,-5,3,4,6] **Output:** 102 **Explanation:** An optimal solution is as follows: - Choose from the start, [_**-5**_ ,-3,-3,-2,7,1], adding -5 * -10 = 50 to the score. - Choose from the start, [**_-3_** ,-3,-2,7,1], adding -3 * -5 = 15 to the score. - Choose from the start, [**_-3_** ,-2,7,1], adding -3 * 3 = -9 to the score. - Choose from

the end, [-2,7,**_1_**], adding 1 * 4 = 4 to the score. - Choose from the end, [-2,**_7_**], adding 7 * 6 = 42 to the score. The total score is 50 + 15 - 9 + 4 + 42 = 102.

Constraints:

* `n == nums.length` * `m == multipliers.length` * `1 <= m <= 300` * `m <= n <= 105`` ` * `-1000 <= nums[i], multipliers[i] <= 1000`

Code Snippets

C++:

```
class Solution {
public:
int maximumScore(vector<int>& nums, vector<int>& multipliers) {

}
};
```

Java:

```
class Solution {
public int maximumScore(int[] nums, int[] multipliers) {

}
}
```

Python3:

```
class Solution:
def maximumScore(self, nums: List[int], multipliers: List[int]) -> int:
```