Problem 3404: Count Special Subsequences

Problem Information

Difficulty: Medium
Acceptance Rate: 29.53%
Paid Only: No
Tags: Array, Hash Table, Math, Enumeration

Problem Description

You are given an array `nums` consisting of positive integers.

A **special subsequence** is defined as a subsequence of length 4, represented by indices `(p, q, r, s)`, where `p < q < r < s`. This subsequence **must** satisfy the following conditions:

* `nums[p] * nums[r] == nums[q] * nums[s]` * There must be _at least_ **one** element between each pair of indices. In other words, `q - p > 1`, `r - q > 1` and `s - r > 1`.

Return the _number_ of different **special** **subsequences** in `nums`.

Example 1:

Input: nums = [1,2,3,4,3,6,1]

Output: 1

Explanation:

There is one special subsequence in `nums`.

* `(p, q, r, s) = (0, 2, 4, 6)`: * This corresponds to elements `(1, 3, 3, 1)`. * `nums[p] * nums[r] = nums[0] * nums[4] = 1 * 3 = 3` * `nums[q] * nums[s] = nums[2] * nums[6] = 3 * 1 = 3`

Example 2:

Input: nums = [3,4,3,4,3,4,3,4]

Output: 3

Explanation:

There are three special subsequences in `nums`.

* `(p, q, r, s) = (0, 2, 4, 6)`: * This corresponds to elements `(3, 3, 3, 3)`. * `nums[p] * nums[r] = nums[0] * nums[4] = 3 * 3 = 9` * `nums[q] * nums[s] = nums[2] * nums[6] = 3 * 3 = 9` * `(p, q, r, s) = (1, 3, 5, 7)`: * This corresponds to elements `(4, 4, 4, 4)`. * `nums[p] * nums[r] = nums[1] * nums[5] = 4 * 4 = 16` * `nums[q] * nums[s] = nums[3] * nums[7] = 4 * 4 = 16` * `(p, q, r, s) = (0, 2, 5, 7)`: * This corresponds to elements `(3, 3, 4, 4)`. * `nums[p] * nums[r] = nums[0] * nums[5] = 3 * 4 = 12` * `nums[q] * nums[s] = nums[2] * nums[7] = 3 * 4 = 12`

Constraints:

* `7 <= nums.length <= 1000` * `1 <= nums[i] <= 1000`

Code Snippets

C++:

```
class Solution {
public:
long long numberOfSubsequences(vector<int>& nums) {

}
};
```

Java:

```
class Solution {
public long numberOfSubsequences(int[] nums) {

}
}
```

Python3:

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