STUDENT REPORT

DETAILS

Name

SHAIKH MOHAMMAD KAIF

Roll Number

KUB23CSE131

EXPERIMENT

Title

NUMBER OF COMBINATIONS LEADING TO A PRODUCT

Description

Problem Statement:

You are given an array arr and a product m. Your task is to find the number of possible unique triplets whose product of elements is m.

Input Format:

- The first line contains the integer, n
- The second line contains space seperated integers of the array, arr
- The third line contains the product m.

The input will be read from the STDIN by the candidate

Output Format:

The output consists of a single integer, i.e. the count of unique triplets having product m.

The output will be matched to the candidate's output printed on the STDOUT

Example:

Input:

7

5 3 20 10 1 4 2

60

Output:

3

Explanation:

Product m:60

Possible triplets for product m: (5,4,3),(20,3,1), (10,3,2)

The count of unique triplets is 3.

Source Code:

```
def count_unique_triplets(arr, m):
    arr.sort()  # Sort the array
    unique_triplets = set()  # Use a set to store unique triplets
    n = len(arr)

    for i in range(n):
        # Avoid using the same element for the triplet
        if i > 0 and arr[i] == arr[i - 1]:
            continue

        # Using two pointers for the other two elements
        left, right = i + 1, n - 1

        while left < right:
            product = arr[i] * arr[left] * arr[right]
            if product == m:
                # Found a valid triplet
                triplet = (arr[i], arr[left], arr[right])
                unique_triplets.add(triplet)
                # Move both pointers to look for new pairs
                left += 1
                right -= 1
                # Skip duplicates on left
                while left < right and arr[left] == arr[left - 1]:
                    left += 1
                # Skip duplicates on right
                while left < right and arr[right] == arr[right + 1]:
                    right -= 1
            elif product < m:
                left += 1  # We need a larger product
            else:
                right -= 1  # We need a smaller product

    return len(unique_triplets)  # Return the count of unique triplets

# Reading inputs
import sys
input = sys.stdin.read
data = input().splitlines()
n = int(data[0])
arr = list(map(int, data[1].split()))
m = int(data[2])

# Calculating and printing the result
result = count_unique_triplets(arr, m)
print(result)
```

RESULT

6 / 6 Test Cases Passed | 100 %