Problem 1458: Max Dot Product of Two Subsequences

Problem Information

Difficulty: Hard
Acceptance Rate: 0.00%
Paid Only: No

Problem Description

Given two arrays

nums1

and

nums2

.

Return the maximum dot product between

non-empty

subsequences of nums1 and nums2 with the same length.

A subsequence of a array is a new array which is formed from the original array by deleting some (can be none) of the characters without disturbing the relative positions of the remaining characters. (ie,

[2,3,5]

is a subsequence of

[1,2,3,4,5]

while

[1,5,3]

is not).

Example 1:

Input:

nums1 = [2,1,-2,5], nums2 = [3,0,-6]

Output:

18

Explanation:

Take subsequence [2,-2] from nums1 and subsequence [3,-6] from nums2. Their dot product is (2*3 + (-2)*(-6)) = 18.

Example 2:

Input:

nums1 = [3,-2], nums2 = [2,-6,7]

Output:

21

Explanation:

Take subsequence [3] from nums1 and subsequence [7] from nums2. Their dot product is (3*7) = 21.

Example 3:

Input:

nums1 = [-1,-1], nums2 = [1,1]

Output:

-1

Explanation:

Take subsequence [-1] from nums1 and subsequence [1] from nums2. Their dot product is -1.

Constraints:

1 <= nums1.length, nums2.length <= 500

-1000 <= nums1[i], nums2[i] <= 1000

Code Snippets

C++:

```
class Solution {
public:
int maxDotProduct(vector<int>& nums1, vector<int>& nums2) {

}
};
```

Java:

```
class Solution {
public int maxDotProduct(int[] nums1, int[] nums2) {

}
}
```

Python3:

```
class Solution:
def maxDotProduct(self, nums1: List[int], nums2: List[int]) -> int:
```

Python:

```
class Solution(object):
def maxDotProduct(self, nums1, nums2):
"""
:type nums1: List[int]
:type nums2: List[int]
:rtype: int
"""
```

JavaScript:

```
/**
* @param {number[]} nums1
* @param {number[]} nums2
* @return {number}
*/
var maxDotProduct = function(nums1, nums2) {

};
```

TypeScript:

```
function maxDotProduct(nums1: number[], nums2: number[]): number {

};
```

C#:

```
public class Solution {
public int MaxDotProduct(int[] nums1, int[] nums2) {

}
}
```

C:

```
int maxDotProduct(int* nums1, int nums1Size, int* nums2, int nums2Size) {

}
```

Go:

```
func maxDotProduct(nums1 []int, nums2 []int) int {

}
```

Kotlin:

```
class Solution {
fun maxDotProduct(nums1: IntArray, nums2: IntArray): Int {

}
}
```

Swift:

```
class Solution {
func maxDotProduct(_ nums1: [Int], _ nums2: [Int]) -> Int {

}
}
```

Rust:

```
impl Solution {
pub fn max_dot_product(nums1: Vec<i32>, nums2: Vec<i32>) -> i32 {

}
}
```

Ruby:

```
# @param {Integer[]} nums1
# @param {Integer[]} nums2
# @return {Integer}
def max_dot_product(nums1, nums2)

end
```

PHP:

```
class Solution {

/**
* @param Integer[] $nums1
```

```
* @param Integer[] $nums2
* @return Integer
*/
function maxDotProduct($nums1, $nums2) {

}
}
```

Dart:

```
class Solution {
int maxDotProduct(List<int> nums1, List<int> nums2) {

}
}
```

Scala:

```
object Solution {
def maxDotProduct(nums1: Array[Int], nums2: Array[Int]): Int = {

}
}
```

Elixir:

```
defmodule Solution do
@spec max_dot_product(nums1 :: [integer], nums2 :: [integer]) :: integer
def max_dot_product(nums1, nums2) do

end
end
```

Erlang:

```
-spec max_dot_product(Nums1 :: [integer()], Nums2 :: [integer()]) ->
integer().
max_dot_product(Nums1, Nums2) ->
.
```

Racket:

```
(define/contract (max-dot-product nums1 nums2)
(-> (listof exact-integer?) (listof exact-integer?) exact-integer?)
)
```

Solutions

C++ Solution:

```
/*
* Problem: Max Dot Product of Two Subsequences
* Difficulty: Hard
* Tags: array, dp
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(n) or O(n * m) for DP table
*/

class Solution {
public:
int maxDotProduct(vector<int>& nums1, vector<int>& nums2) {

}
};
```

Java Solution:

```
/**
* Problem: Max Dot Product of Two Subsequences
* Difficulty: Hard
* Tags: array, dp
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(n) or O(n * m) for DP table
*/

class Solution {
public int maxDotProduct(int[] nums1, int[] nums2) {

}
```

```
}
```

Python3 Solution:

```
"""
Problem: Max Dot Product of Two Subsequences
Difficulty: Hard
Tags: array, dp

Approach: Use two pointers or sliding window technique
Time Complexity: O(n) or O(n log n)
Space Complexity: O(n) or O(n * m) for DP table
"""

class Solution:
def maxDotProduct(self, nums1: List[int], nums2: List[int]) -> int:
# TODO: Implement optimized solution
pass
```

Python Solution:

```
class Solution(object):
def maxDotProduct(self, nums1, nums2):
"""
:type nums1: List[int]
:type nums2: List[int]
:rtype: int
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JavaScript Solution:

```
/**
* Problem: Max Dot Product of Two Subsequences
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*/
```

```
/**
* @param {number[]} nums1
* @param {number[]} nums2
* @return {number}
*/
var maxDotProduct = function(nums1, nums2) {

};
```

TypeScript Solution:

```
/**
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function maxDotProduct(nums1: number[], nums2: number[]): number {

};
```

C# Solution:

```
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* Time Complexity: O(n) or O(n log n)
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*/

public class Solution {
public int MaxDotProduct(int[] nums1, int[] nums2) {

}
```

```
}
```

C Solution:

```
/*
* Problem: Max Dot Product of Two Subsequences
* Difficulty: Hard
* Tags: array, dp
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(n) or O(n * m) for DP table
*/

int maxDotProduct(int* nums1, int nums1Size, int* nums2, int nums2Size) {

}
```

Go Solution:

```
// Problem: Max Dot Product of Two Subsequences
// Difficulty: Hard
// Tags: array, dp
//
// Approach: Use two pointers or sliding window technique
// Time Complexity: O(n) or O(n log n)
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func maxDotProduct(nums1 []int, nums2 []int) int {

}
```

Kotlin Solution:

```
class Solution {
fun maxDotProduct(nums1: IntArray, nums2: IntArray): Int {

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class Solution {
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impl Solution {
pub fn max_dot_product(nums1: Vec<i32>, nums2: Vec<i32>) -> i32 {

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Ruby Solution:

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# @param {Integer[]} nums1
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# @return {Integer}
def max_dot_product(nums1, nums2)

end
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```
class Solution {

/**
* @param Integer[] $nums1
* @param Integer[] $nums2
* @return Integer
*/
function maxDotProduct($nums1, $nums2) {
```

```
}
}
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