Problem 3732: Maximum Product of Three Elements After One Replacement

Problem Information

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

Problem Description

You are given an integer array

nums

.

You

must

replace

exactly one

element in the array with

any

integer value in the range

[-10

5

, 10

5

]

(inclusive).

After performing this single replacement, determine the

maximum possible product

of

any three

elements at

distinct indices

from the modified array.

Return an integer denoting the

maximum product

achievable.

Example 1:

Input:

nums = [-5,7,0]

Output:

3500000

Explanation:

Replacing 0 with -10

5

gives the array

[-5, 7, -10

5

]

, which has a product

(-5) * 7 * (-10

5

) = 3500000

. The maximum product is 3500000.

Example 2:

Input:

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

Output:

1200000

Explanation:

Two ways to achieve the maximum product include:

[-4, -2, -3]

→ replace -2 with 10

5

→ product =

(-4) * 10

5

* (-3) = 1200000

.

[-4, -1, -3]

→ replace -1 with 10

5

→ product =

(-4) * 10

5

* (-3) = 1200000

.

The maximum product is 1200000.

Example 3:

Input:

nums = [0,10,0]

Output:

0

Explanation:

There is no way to replace an element with another integer and not have a 0 in the array. Hence, the product of all three elements will always be 0, and the maximum product is 0.

Constraints:

3 <= nums.length <= 10

5

-10

5

<= nums[i] <= 10

5

Code Snippets

C++:

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

}
};
```

Java:

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

}
}
```

Python3:

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

Python:

```
class Solution(object):
def maxProduct(self, nums):
"""
:type nums: List[int]
:rtype: int
"""
```

JavaScript:

```
/**
* @param {number[]} nums
* @return {number}
*/
var maxProduct = function(nums) {

};
```

TypeScript:

```
function maxProduct(nums: number[]): number {

};
```

C#:

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

}
}
```

C:

```
long long maxProduct(int* nums, int numsSize) {

}
```

Go:

```
func maxProduct(nums []int) int64 {

}
```

Kotlin:

```
class Solution {
fun maxProduct(nums: IntArray): Long {

}
}
```

Swift:

```
class Solution {
func maxProduct(_ nums: [Int]) -> Int {

}
}
```

Rust:

```
impl Solution {
pub fn max_product(nums: Vec<i32>) -> i64 {

}
}
```

Ruby:

```
# @param {Integer[]} nums
# @return {Integer}
def max_product(nums)

end
```

PHP:

```
class Solution {

/**
```

```
* @param Integer[] $nums
* @return Integer
*/
function maxProduct($nums) {

}
}
```

Dart:

```
class Solution {
int maxProduct(List<int> nums) {

}
}
```

Scala:

```
object Solution {
def maxProduct(nums: Array[Int]): Long = {

}
}
```

Elixir:

```
defmodule Solution do
@spec max_product(nums :: [integer]) :: integer
def max_product(nums) do

end
end
```

Erlang:

```
-spec max_product(Nums :: [integer()]) -> integer().
max_product(Nums) ->
.
```

Racket:

```
(define/contract (max-product nums)
(-> (listof exact-integer?) exact-integer?)
)
```

Solutions

C++ Solution:

```
/*
* Problem: Maximum Product of Three Elements After One Replacement
* Difficulty: Medium
* Tags: array, greedy, math, sort
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

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

}
};
```

Java Solution:

```
/**
* Problem: Maximum Product of Three Elements After One Replacement
* Difficulty: Medium
* Tags: array, greedy, math, sort
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

class Solution {
public long maxProduct(int[] nums) {

}
```

```
}
```

Python3 Solution:

```
"""
Problem: Maximum Product of Three Elements After One Replacement
Difficulty: Medium
Tags: array, greedy, math, sort

Approach: Use two pointers or sliding window technique
Time Complexity: O(n) or O(n log n)
Space Complexity: O(1) to O(n) depending on approach
"""

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

Python Solution:

```
class Solution(object):
def maxProduct(self, nums):
"""
:type nums: List[int]
:rtype: int
"""
```

JavaScript Solution:

```
/**
* Problem: Maximum Product of Three Elements After One Replacement
* Difficulty: Medium
* Tags: array, greedy, math, sort
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

/**
```

```
* @param {number[]} nums
* @return {number}
*/
var maxProduct = function(nums) {

};
```

TypeScript Solution:

```
/**
* Problem: Maximum Product of Three Elements After One Replacement
* Difficulty: Medium
* Tags: array, greedy, math, sort
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

function maxProduct(nums: number[]): number {

};
```

C# Solution:

```
/*
* Problem: Maximum Product of Three Elements After One Replacement
* Difficulty: Medium
* Tags: array, greedy, math, sort
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

public class Solution {
public long MaxProduct(int[] nums) {

}
}
```

C Solution:

```
/*
* Problem: Maximum Product of Three Elements After One Replacement
* Difficulty: Medium
* Tags: array, greedy, math, sort
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

long long maxProduct(int* nums, int numsSize) {

}
```

Go Solution:

```
// Problem: Maximum Product of Three Elements After One Replacement
// Difficulty: Medium
// Tags: array, greedy, math, sort
//
// Approach: Use two pointers or sliding window technique
// Time Complexity: O(n) or O(n log n)
// Space Complexity: O(1) to O(n) depending on approach

func maxProduct(nums []int) int64 {

}
```

Kotlin Solution:

```
class Solution {
fun maxProduct(nums: IntArray): Long {

}
}
```

Swift Solution:

```
class Solution {
func maxProduct(_ nums: [Int]) -> Int {
```

```
}
}
```

Rust Solution:

```
// Problem: Maximum Product of Three Elements After One Replacement
// Difficulty: Medium
// Tags: array, greedy, math, sort
//
// Approach: Use two pointers or sliding window technique
// Time Complexity: O(n) or O(n log n)
// Space Complexity: O(1) to O(n) depending on approach

impl Solution {
pub fn max_product(nums: Vec<i32>) -> i64 {

}
}
```

Ruby Solution:

```
# @param {Integer[]} nums
# @return {Integer}
def max_product(nums)

end
```

PHP Solution:

```
class Solution {

/**
* @param Integer[] $nums
* @return Integer
*/
function maxProduct($nums) {

}
}
```

Dart Solution:

```
class Solution {
int maxProduct(List<int> nums) {

}
}
```

Scala Solution:

```
object Solution {
def maxProduct(nums: Array[Int]): Long = {

}
}
```

Elixir Solution:

```
defmodule Solution do
@spec max_product(nums :: [integer]) :: integer
def max_product(nums) do

end
end
```

Erlang Solution:

```
-spec max_product(Nums :: [integer()]) -> integer().
max_product(Nums) ->
.
```

Racket Solution:

```
(define/contract (max-product nums)
(-> (listof exact-integer?) exact-integer?)
)
```