

Problem 3489: Zero Array Transformation IV

Problem Information

Difficulty: **Medium**

Acceptance Rate: 0.00%

Paid Only: No

Problem Description

You are given an integer array

`nums`

of length

`n`

and a 2D array

`queries`

, where

`queries[i] = [l`

`i`

, `r`

`i`

, `val`

`i`

]

.

Each

queries[i]

represents the following action on

nums

:

Select a

subset

of indices in the range

[l

i

, r

i

]

from

nums

.

Decrement the value at each selected index by

exactly

val

i

.

A

Zero Array

is an array with all its elements equal to 0.

Return the

minimum

possible

non-negative

value of

k

, such that after processing the first

k

queries in

sequence

,

nums

becomes a

Zero Array

. If no such

k

exists, return -1.

Example 1:

Input:

nums = [2,0,2], queries = [[0,2,1],[0,2,1],[1,1,3]]

Output:

2

Explanation:

For query 0 (l = 0, r = 2, val = 1):

Decrement the values at indices

[0, 2]

by 1.

The array will become

[1, 0, 1]

.

For query 1 (l = 0, r = 2, val = 1):

Decrement the values at indices

[0, 2]

by 1.

The array will become

[0, 0, 0]

, which is a Zero Array. Therefore, the minimum value of

k

is 2.

Example 2:

Input:

nums = [4,3,2,1], queries = [[1,3,2],[0,2,1]]

Output:

-1

Explanation:

It is impossible to make nums a Zero Array even after all the queries.

Example 3:

Input:

nums = [1,2,3,2,1], queries = [[0,1,1],[1,2,1],[2,3,2],[3,4,1],[4,4,1]]

Output:

4

Explanation:

For query 0 ($l = 0$, $r = 1$, $val = 1$):

Decrement the values at indices

[0, 1]

by

1

.

The array will become

[0, 1, 3, 2, 1]

.

For query 1 ($l = 1$, $r = 2$, $val = 1$):

Decrement the values at indices

[1, 2]

by 1.

The array will become

[0, 0, 2, 2, 1]

.

For query 2 ($l = 2$, $r = 3$, $val = 2$):

Decrement the values at indices

[2, 3]

by 2.

The array will become

[0, 0, 0, 0, 1]

.

For query 3 (l = 3, r = 4, val = 1):

Decrement the value at index 4 by 1.

The array will become

[0, 0, 0, 0, 0]

. Therefore, the minimum value of

k

is 4.

Example 4:

Input:

nums = [1,2,3,2,6], queries = [[0,1,1],[0,2,1],[1,4,2],[4,4,4],[3,4,1],[4,4,5]]

Output:

4

Constraints:

$1 \leq \text{nums.length} \leq 10$

$0 \leq \text{nums}[i] \leq 1000$

$1 \leq \text{queries.length} \leq 1000$

```
queries[i] = [l
```

```
i
```

```
, r
```

```
i
```

```
, val
```

```
i
```

```
]
```

```
0 <= l
```

```
i
```

```
<= r
```

```
i
```

```
< nums.length
```

```
1 <= val
```

```
i
```

```
<= 10
```

Code Snippets

C++:

```
class Solution {  
public:  
    int minZeroArray(vector<int>& nums, vector<vector<int>>& queries) {
```



```
}  
};
```

Java:

```
class Solution {  
    public int minZeroArray(int[] nums, int[][] queries) {  
  
    }  
}
```

Python3:

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

Python:

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

JavaScript:

```
/**  
 * @param {number[]} nums  
 * @param {number[][]} queries  
 * @return {number}  
 */  
var minZeroArray = function(nums, queries) {  
  
};
```

TypeScript:

```
function minZeroArray(nums: number[], queries: number[][]): number {  
  
};
```

C#:

```
public class Solution {  
    public int MinZeroArray(int[] nums, int[][] queries) {  
  
    }  
}
```

C:

```
int minZeroArray(int* nums, int numsSize, int** queries, int queriesSize,  
int* queriesColSize) {  
  
}
```

Go:

```
func minZeroArray(nums []int, queries [][]int) int {  
  
}
```

Kotlin:

```
class Solution {  
    fun minZeroArray(nums: IntArray, queries: Array<IntArray>): Int {  
  
    }  
}
```

Swift:

```
class Solution {  
    func minZeroArray(_ nums: [Int], _ queries: [[Int]]) -> Int {  
  
    }  
}
```

Rust:

```
impl Solution {  
    pub fn min_zero_array(nums: Vec<i32>, queries: Vec<Vec<i32>>) -> i32 {  
  
    }  
}
```

```
}
```

Ruby:

```
# @param {Integer[]} nums
# @param {Integer[][]} queries
# @return {Integer}
def min_zero_array(nums, queries)

end
```

PHP:

```
class Solution {

    /**
     * @param Integer[] $nums
     * @param Integer[][] $queries
     * @return Integer
     */
    function minZeroArray($nums, $queries) {

    }

}
```

Dart:

```
class Solution {
  int minZeroArray(List<int> nums, List<List<int>> queries) {

  }
}
```

Scala:

```
object Solution {
  def minZeroArray(nums: Array[Int], queries: Array[Array[Int]]): Int = {

  }
}
```

Elixir:

```

defmodule Solution do
  @spec min_zero_array(nums :: [integer], queries :: [[integer]]) :: integer
  def min_zero_array(nums, queries) do

  end

end

```

Erlang:

```

-spec min_zero_array(Nums :: [integer()], Queries :: [[integer()]]) ->
integer().
min_zero_array(Nums, Queries) ->
.

```

Racket:

```

(define/contract (min-zero-array nums queries)
  (-> (listof exact-integer?) (listof (listof exact-integer?)) exact-integer?)
  )

```

Solutions

C++ Solution:

```

/*
 * Problem: Zero Array Transformation IV
 * Difficulty: Medium
 * 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 minZeroArray(vector<int>& nums, vector<vector<int>>& queries) {

    }

};

```

Java Solution:

```
/**
 * Problem: Zero Array Transformation IV
 * Difficulty: Medium
 * 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 minZeroArray(int[] nums, int[][] queries) {

}
}
```

Python3 Solution:

```
"""
Problem: Zero Array Transformation IV
Difficulty: Medium
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 minZeroArray(self, nums: List[int], queries: List[List[int]]) -> int:
# TODO: Implement optimized solution
pass
```

Python Solution:

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

```
"""
```

JavaScript Solution:

```
/**
 * Problem: Zero Array Transformation IV
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 * Approach: Use two pointers or sliding window technique
 * Time Complexity: O(n) or O(n log n)
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 */

/**
 * @param {number[]} nums
 * @param {number[][]} queries
 * @return {number}
 */
var minZeroArray = function(nums, queries) {

};
```

TypeScript Solution:

```
/**
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 * Difficulty: Medium
 * Tags: array, dp
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 * 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
 */

function minZeroArray(nums: number[], queries: number[][]): number {

};
```

C# Solution:

```

/*
 * Problem: Zero Array Transformation IV
 * Difficulty: Medium
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 * Time Complexity: O(n) or O(n log n)
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 */

public class Solution {
    public int MinZeroArray(int[] nums, int[][] queries) {

    }
}

```

C Solution:

```

/*
 * Problem: Zero Array Transformation IV
 * Difficulty: Medium
 * Tags: array, dp
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 * 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 minZeroArray(int* nums, int numsSize, int** queries, int queriesSize,
int* queriesColSize) {

}

```

Go Solution:

```

// Problem: Zero Array Transformation IV
// Difficulty: Medium
// 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 minZeroArray(nums []int, queries [][]int) int {

}

```

Kotlin Solution:

```

class Solution {
    fun minZeroArray(nums: IntArray, queries: Array<IntArray>): Int {

    }
}

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Swift Solution:

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class Solution {
    func minZeroArray(_ nums: [Int], _ queries: [[Int]]) -> Int {

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// Time Complexity: O(n) or O(n log n)
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impl Solution {
    pub fn min_zero_array(nums: Vec<i32>, queries: Vec<Vec<i32>>) -> i32 {

    }
}

```

Ruby Solution:

```

# @param {Integer[]} nums
# @param {Integer[][]} queries

```



```
# @return {Integer}
def min_zero_array(nums, queries)

end
```

PHP Solution:

```
class Solution {

    /**
     * @param Integer[] $nums
     * @param Integer[][] $queries
     * @return Integer
     */
    function minZeroArray($nums, $queries) {

    }

}
```

Dart Solution:

```
class Solution {
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object Solution {
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Elixir Solution:

```
defmodule Solution do
  @spec min_zero_array(nums :: [integer], queries :: [[integer]]) :: integer
  def min_zero_array(nums, queries) do
```

```
end  
end
```

Erlang Solution:

```
-spec min_zero_array(Nums :: [integer()], Queries :: [[integer()]]) ->  
integer().  
min_zero_array(Nums, Queries) ->  
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(define/contract (min-zero-array nums queries)  
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