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349. Intersection of Two Arrays 2

March 1, 2019 | 116.8K views Average Rating: 3.93 (55 votes)

Example 1:

Given two arrays, write a function to compute their intersection.

```
Input: nums1 = [1,2,2,1], nums2 = [2,2]
 Output: [2]
Example 2:
```

## **Input:** nums1 = [4,9,5], nums2 = [9,4,9,8,4]

```
Output: [9,4]
Note:
```

- · Each element in the result must be unique. The result can be in any order.

## Approach 1: Two Sets

Solution

### The naive approach would be to iterate along the first array nums1 and to check for each value if this value

nums2 = [9, 4, 9, 8, 4]

time complexity, where n and m are arrays' lengths.

### in nums2 or not. If yes - add the value to output. Such an approach would result in a pretty bad $\mathcal{O}(n \times m)$

Intuition

To solve the problem in linear time, let's use the structure set, which provides in/contains operation in  $\mathcal{O}(1)$  time in average case.

The idea is to convert both arrays into sets, and then iterate over the smallest set checking the presence of

each element in the larger set. Time complexity of this approach is  $\mathcal{O}(n+m)$  in the average case.

nums1 = [4, 9, 5]

```
Implementation
 Java
       Python
  1 class Solution:
         def set_intersection(self, set1, set2):
```

return [x for x in set1 if x in set2]

def intersection(self, nums1, nums2):

:type nums1: List[int]

:type nums2: List[int] :rtype: List[int]

if len(set1) < len(set2):

return self.set\_intersection(set1, set2)

return self.set\_intersection(set2, set1)

set1 = set(nums1)

set2 = set(nums2)

# average case.

Implementation

Java

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Comments: 33

Preview

Python

class Solution:

**Complexity Analysis** 

6

8

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16 17

Approach 2: Built-in Set Intersection Intuition

• Time complexity:  $\mathcal{O}(n+m)$ , where n and m are arrays' lengths.  $\mathcal{O}(n)$  time is used to convert

• Space complexity :  $\mathcal{O}(m+n)$  in the worst case when all elements in the arrays are different.

nums1 into set,  $\mathcal{O}(m)$  time is used to convert nums2, and contains/in operations are  $\mathcal{O}(1)$  in the

There are built-in intersection facilities, which provide  $\mathcal{O}(n+m)$  time complexity in the average case and

def intersection(self, nums1, nums2):

:type nums1: List[int] :type nums2: List[int] :rtype: List[int]

set1 = set(nums1)

In Python it's intersection operator, in Java - retainAll() function.

 $\mathcal{O}(n \times m)$  time complexity in the worst case.

```
set2 = set(nums2)
 10
             return list(set2 & set1)
Complexity Analysis
  • Time complexity : \mathcal{O}(n+m) in the average case and \mathcal{O}(n \times m) in the worst case when load factor is
     high enough.
  • Space complexity : \mathcal{O}(n+m) in the worst case when all elements in the arrays are different.
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```

Then they ask you to solve it under these constraints: O(n) time and O(1) space (the resulting array of intersections is not taken into consideration). Read More 446 A V C Share Share Reply **SHOW 44 REPLIES** JAMESJJ78 \* 207 • April 10, 2019 7:45 PM Sometimes I feel like a rocket scientist when I see all the maths formulas 79 A V C Share Reply benkemal \* 24 O October 21, 2019 1:07 AM Here is a solution which is faster than 98% of the submissions: Actually we don't need the second set, 1 set is enough, then we need to compare second array against

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They ask for the intersection, which has a trivial solution using a hash or a set.

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This is a Facebook interview question.

**SHOW 6 REPLIES** terrible\_whiteboard 🖈 633 🗿 May 19, 2020 6:27 PM I made a video if anyone is having trouble understanding the solution (clickable link) https://youtu.be/Wo7dbhMEw0o

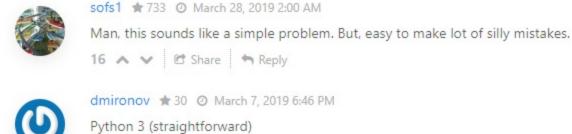
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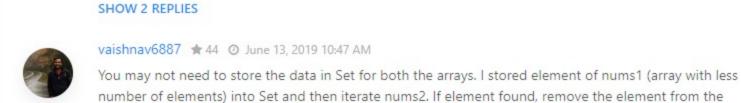
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Here is my javascript solution.

directly?



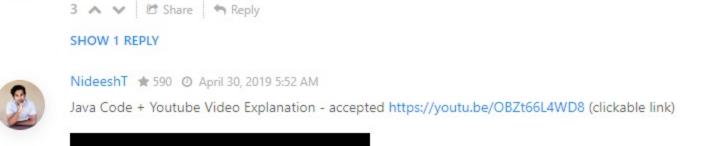


set, and add the current element to an Array to be returned.

return list(set(nums2)-(set(nums2) - set(nums1)))

10 A V 🖰 Share 🥱 Reply **SHOW 3 REPLIES** dragonpolice 🖈 154 🧿 April 29, 2019 1:34 PM Why in the end of the first approach, it returns Arrays.copyOf(output, idx) instead of output array

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