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vo Sum Leetcode Solution

lty Level   Easy

ently asked in   Apple   ByteDance   Intuit   Microsoft   Oracle

Tags   algorithms   Binary Search   coding   Interview   interviewprep   LeetCode   LeetCodeSolutions   Two Pointer

In this problem, we have to find a pair of two distinct indices in a **sorted** array that their values add up to a given target. We can assume that the array has only **one** pair of integers that add up to the target sum. Note that the array is sorted in a **non-decreasing** manner.

X

🇬🇧 **English**

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Example

Approach(Brute Force)

Algorithm

Implementation of Two Sum Leetcode Solution

C++ Program

Java Program

Complexity Analysis of Two Sum Leetcode Solution

Time Complexity

Space complexity

Approach(Two Pointer)

Algorithm

Implementation of Two Sum Leetcode Solution

C++ Program

Java Program

Complexity Analysis of Two Sum Leetcode Solution

Time Complexity

X

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Input

```
Array = {1 , 2 , 3 , 4 , 5}
Target = 6
```

Output

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Input
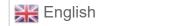
```
Array = {1 , 4 , 5 , 11 , 12}
Target = 9
```

tput

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proach(Brute Force)

This approach is straightforward. We can check for every pair in the array and if their sum is equal to the given target, print their indices. This kind of Brute Force solution needs to check every possible pair and number of possible pairs in the array = **n * (n − 1) / 2.** So, in the worst-case, this approach can be slow.

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Algorithm

1. Run a loop to maintain the first index of the solution in the array
2. Run another loop to maintain a second index of the solution for every first integer
3. If at any point, the sum of values of two indices is equal to the target
   - Print its indices

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C++ Program

Code

```
nclude <bits/stdc++.h>
ing namespace std;

ctor <int> targetSum(vector <int> &a , int &target)

    int n = a.size();
    for(int i = 0 ; i < n - 1 ; i++)
        for(int j = i + 1 ; j < n ; j++)
        {
            if(a[i] + a[j] == target)
                return {i + 1 , j + 1};
        }
    return {};
}
```

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```
for(int &x : targetSum(a , target))
        cout << x << " ";
    cout << '\n';
}
```

Java Program

Code

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```
static int[] targetSum(int []a , int target)
{
    for(int i = 0 ; i < a.length - 1 ; i++)
        for(int j = i + 1 ; j < a.length ; j++)
        {
            if(a[i] + a[j] == target)
                return new int[]{i + 1 , j + 1};
        }
    return new int[]{-1 , -1};
}


public static void main(String args[])
{
    int [] a = {1 , 4 , 5 , 11 , 12};
    int target = 9;

    for(int x : targetSum(a , target))
        System.out.print(x + " ");
}
```

X

Complexity Analysis of Two Sum Leetcode Solution

Time Complexity

O(N * N), where N = size of the array. As we check for possible pair, and the total number of pairs are: **N * (N – 1) / 2.**

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Space complexity

. Only constant space for variables is used.

proach(Two Pointer)

Algorithm

The give array is **sorted.** This is a special case because we know that if we have fixed a first index then the required value to fulfill the target an be found ahead in the array using **binary search.**

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are equal, then we have found the **only** solution. So, we return this index pair. Otherwise, if the sum of values is **less** than the target, we need to increment or dec rement one of the pointers. Obviously, we are bringing the **right** pointer from the end only. So, we should increment the **left** pointer and check for the same condition. Similarly, if sum of values is more target, we decrement the **right** pointer.

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...plementation of Two Sum Leetcode Solution

C++ Program

Code

```
#include <bits/stdc++.h>
using namespace std;
```

X

```
    while(left < right)
    {
        tempSum = a[left] + a[right];
        if(tempSum == target)
            return {left + 1 , right + 1};
        if(tempSum > target)
            right--;
        else
            left++;
    }
```

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```
int main()
{
    vector <int> a = {1 , 4 , 5 , 11 , 12};
    int target = 9;
    for(int &x : targetSum(a , target))
        cout << x << " ";
    cout << '\n';
```

a Program

Code

```
class target_sum
{
    static int[] targetSum(int []a , int target)
    {
        int left = 0 , right = a.length - 1 , tempSum;
```

X

```
        if(tempSum > target)
            right--;
        else
            left++;
    }
    return new int[]{-1 , -1};
}
```

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```
int [] a = {1 , 4 , 5 , 11 , 12};
int target = 9;

for(int x : targetSum(a , target))
    System.out.print(x + " ");
}
```

tput

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Complexity Analysis of Two Sum Leetcode Solution

Time Complexity

O(N), as even in the worst case, we visit all the elements in the array only once.

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Space complexity

O(1). We use constant space for variables.

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