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Grokking the Coding Interview: Patterns for Coding Questions

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Triplet Sum Close to Target (medium)

We'll cover the following ^

- Problem Statement
- Try it yourself
- Solution
 - Code
 - Time complexity
 - Space complexity

Problem Statement

Given an array of unsorted numbers and a target number, find a **triplet in the array whose sum is as close to the target number as possible**, return the sum of the triplet. If there are more than one such triplet, return the sum of the triplet with the smallest sum.

Example 1:

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Input: [-2, 0, 1, 2], target=2

Output: 1

Explanation: The triplet [-2, 1, 2] has the closest sum to the target.



Example 2:

Input: [-3, -1, 1, 2], target=1

Output: 0

Explanation: The triplet [-3, 1, 2] has the closest sum to the target.

Example 3:

Input: [1, 0, 1, 1], target=100

Output: 3

Explanation: The triplet [1, 1, 1] has the closest sum to the target.

Try it yourself

Try solving this question here:

Java

Python3

JS

C++


```
1 import java.util.*;
2
3 class TripletSumCloseToTarget {
4
5     public static int searchTriplet(int[] arr, int target) {
6         // TODO: Write your code here
7         Arrays.sort(arr);
8         int n = arr.length, ans = Integer.MAX_VALUE;
9         for(int i=0; i<arr.length-2; i++)
10         {
11             int start = i+1, end = n-1;
12             while(start<end) {
```



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```
12 while(start<end) {
13     int diff = targetSum-arr[i]-arr[start]-arr|
14     if(diff==0){
15         return targetSum-diff;
16     }
17     ans = Math.min(ans, Math.abs(diff));
18     if(diff>0){
19         start++;
20     }
21     else{
22         end--;
23     }
24 }
25 }
26 return targetSum-ans;
27 }
28 }
```

Test

Save *


Reset



Show Results

Show Console

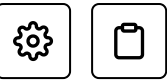


 3 of 3 Tests Passed

Result	Input	Expected Output	Actual Output	Reason
✓	searchTriplet([-2, 0, 1, 2], 2)	1	1	Succeeded
✓	searchTriplet([-3, -1, 1, 2], 1)	0	0	Succeeded
✓	searchTriplet([1, 0, 1, 1], 100)	3	3	Succeeded

3.883s

Solution



This problem follows the **Two Pointers** pattern and is quite similar to Triplet Sum to Zero

(<https://www.educative.io/collection/page/5668639101419520/5671464854355968/5679549973004288/>).

We can follow a similar approach to iterate through the array, taking one number at a time. At every step, we will save the difference between the triplet and the target number, so that in the end, we can return the triplet with the closest sum.

Code

Here is what our algorithm will look like:

Java

Python3

C++

JS

```
1 import java.util.*;
2
3 class TripletSumCloseToTarget {
4
5     public static int searchTriplet(int[] arr, int targetSum) {
6         if (arr == null || arr.length < 3)
7             throw new IllegalArgumentException();
8
9         Arrays.sort(arr);
10        int smallestDifference = Integer.MAX_VALUE;
11        for (int i = 0; i < arr.length - 2; i++) {
12            int left = i + 1, right = arr.length - 1;
13            while (left < right) {
14                // comparing the sum of three numbers to the targetSum
15                // so, we will try to find a target difference
16                int targetDiff = targetSum - arr[i] - arr[left] - arr[right];
17                if (targetDiff == 0) // we've found a triplet with sum equals to the targetSum
18                    return targetSum - targetDiff; // return the sum of the triplet
19            }
20        }
21        // if no triplet is found, return the smallest difference
22        return smallestDifference;
```



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```
20 // the second part of the above 'if' is to
21 if (Math.abs(targetDiff) < Math.abs(smallestDifference))
22     || (Math.abs(targetDiff) == Math.abs(smallestDifference) && targetDiff < 0)
23     smallestDifference = targetDiff; // save the smallest difference
24
25 if (targetDiff > 0)
26     left++; // we need a triplet with a bigger sum
27 else
28     right--; // we need a triplet with a smaller sum
29 }
30 }
31 return targetSum - smallestDifference;
```

Run

Save

Reset



Time complexity

Sorting the array will take $O(N * \log N)$. Overall `searchTriplet()` will take $O(N * \log N + N^2)$, which is asymptotically equivalent to $O(N^2)$.

Space complexity

The space complexity of the above algorithm will be $O(N)$ which is required for sorting.

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Triplet Sum to Zero (medium)

[Next →](#)

Triplets with Smaller Sum (medium)

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