

INTERVIEW QUESTION AND ANSWER



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Q.

Given an array of integers and a value, determine if there are any three integers in the array whose sum equals the given value.



Consider this array and the target sums

3	7	1	2	8	4	5
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Target Sum = 20 $5+7+8 = 20$

Target Sum = 21 no 3 values sum up to 21

Try it yourself below before checking the solution

A.

```
bool find_sum_of_two(vector<int>& A, int val,
size_t start_index) {
    for (int i = start_index, j = A.size() - 1; i < j;) {
        int sum = A[i] + A[j];
        if (sum == val) {
            return true;
        }

        if (sum < val) {
            ++i;
        } else {
            --j;
        }
    }

    return false;
}

bool find_sum_of_three_v3(vector<int> arr,
int required_sum) {

    std::sort(arr.begin(), arr.end());

    for (int i = 0; i < arr.size() - 2; ++i) {
        int remaining_sum = required_sum - arr[i];
        if (find_sum_of_two(arr, remaining_sum, i + 1)) {
            return true;
        }
    }
}
```



A.

```
    return false;
}

int main(){
    vector<int> arr = {-25, -10, -7, -3, 2, 4, 8, 10};

    cout<<"-8: " <<find_sum_of_three_v3(arr, -8)<<endl;
        cout<<"-25: " <<find_sum_of_three_v3(arr,
-25)<<endl;
        cout<<"0: " <<find_sum_of_three_v3(arr, 0)<<endl;
        cout<<"-42: " <<find_sum_of_three_v3(arr,
-42)<<endl;
        cout<<"22: " <<find_sum_of_three_v3(arr, 22)<<endl;
        cout<<"-7: " <<find_sum_of_three_v3(arr, -7)<<endl;
        cout<<"-3: " <<find_sum_of_three_v3(arr, -3)<<endl;
        cout<<"2: " <<find_sum_of_three_v3(arr, 2)<<endl;
        cout<<"4: " <<find_sum_of_three_v3(arr, 4)<<endl;
        cout<<"8: " <<find_sum_of_three_v3(arr, 8)<<endl;
        cout<<"7: " <<find_sum_of_three_v3(arr, 7)<<endl;
        cout<<"1: " <<find_sum_of_three_v3(arr, 1)<<endl;

    return 0;
}
```

In this solution, we sort the **array**. Then, fix one element **e** and find a pair (a, b) in the remaining array so that **required_sum - e** is $a + b$.

Start with first element **e** in the array and try to find such a pair (a, b) in the remaining array (i.e **A[i + 1]** to **A[n - 1]**) that satisfies the condition: **$a+b = required_sum - e$** . If we find the pair, we have found the solution: **a**, **b** and **e**. Now we can stop the iteration.

Otherwise, we repeat the above steps for all elements **e** at **index i = 1** to **n - 3** until we find a pair that meets the condition.

Runtime Complexity: Quadratic, $O(n^2)$
Memory Complexity: Constant, $O(1)$

HOPE THIS CONTENT HELPED YOU!

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WITH **SKILLSLASH**

