

Count Triplets in C++

```
#include <iostream>
#include <algorithm>
using namespace std;

class CountTheTriplets {
public:
    static int countTriplets(int arr[], int n)
    {
        // Sort the array
        sort(arr, arr + n);
        int count = 0;

        // Traverse the array from the end to
        find triplets
        for (int i = n - 1; i >= 2; i--) {
            int left = 0, right = i - 1;

            // Two pointers technique to find
            triplets
            while (left < right) {
                if (arr[left] + arr[right] ==
                arr[i]) {
                    // If valid triplet is found
                    count++;
                    left++;
                    right--;
                } else if (arr[left] + arr[right] <
                arr[i]) {
                    // Move left pointer to
                    increase the sum
                    left++;
                } else {
                    // Move right pointer to
                    decrease the sum
                    right--;
                }
            }
        }

        return count;
    }
};

int main() {
    // Hardcoded input
    int n = 6;
    int arr[] = {1, 3, 5, 2, 7, 4};

    // Call the countTriplets method to
    count triplets
    int result =
    CountTheTriplets::countTriplets(arr, n);

    // Print the result
    cout << "Number of triplets: " << result
    << endl;

    return 0;
}
```

Count the number of **triplets (i, j, k)** in the array such that:

$$\text{arr}[i] + \text{arr}[j] == \text{arr}[k]$$

Where i, j, and k are **distinct indices**.

✓ Input Array:

arr[] = {1, 3, 5, 2, 7, 4}

n = 6

🔄 After Sorting:

arr[] = {1, 2, 3, 4, 5, 7}
 ↑ ↑ ↑ ↑ ↑ ↑
 0 1 2 3 4 5 (indexes)

📝 Dry Run Table:

i (arr[i])	left	right	arr[left] + arr[right]	Comparison	Action	Count
5 (7)	0	4	1 + 5 = 6	< 7	left++ → left=1	0
	1	4	2 + 5 = 7	= 7 → Triplet found!	count++, left++, right--	1
	2	3	3 + 4 = 7	= 7 → Triplet found!	count++, left++, right--	2
4 (5)	0	3	1 + 4 = 5	= 5 → Triplet found!	count++, left++, right--	3
	1	2	2 + 3 = 5	= 5 → Triplet found!	count++, left++, right--	4
3 (4)	0	2	1 + 3 = 4	= 4 → Triplet found!	count++, left++, right--	5
	1	1	loop ends			
2 (3)	0	1	1 + 2 = 3	= 3 → Triplet found!	count++, left++, right--	6

🏁 Final Output:

Number of triplets: 6

✓ Triplets Found:

- (2, 5) → 2 + 5 = 7

	<ul style="list-style-type: none"> • $(3, 4) \rightarrow 3 + 4 = 7$ • $(1, 4) \rightarrow 1 + 4 = 5$ • $(2, 3) \rightarrow 2 + 3 = 5$ • $(1, 3) \rightarrow 1 + 3 = 4$ • $(1, 2) \rightarrow 1 + 2 = 3$
Number of triplets: 6	