Triple Sums

You're given a sequence **s** of **N** distinct integers.
Consider all the possible sums of three integers from the sequence at three different indicies.
For each obtainable sum output the number of different triples of indicies that generate it.

Constraints:
N <= 40000, $|s_i|$ <= 20000

Input

The first line of input contains a single integer N.
Each of the next N lines contain an element of s.

Output

Print the solution for each possible sum in the following format:
sum_value : number_of_triples

Smaller sum values should be printed first.

Example

Input:

5
-1
2
3
0
5

Output:

1 : 1
2 : 1
4 : 2
5 : 1
6 : 1
7 : 2
8 : 1
10 : 1

Explanation:
4 can be obtained using triples (0, 1, 2) and (0, 3, 4).
7 can be obtained using triples (0, 2, 4) and (1, 3, 4).

Note: a triple is considered the same as any of its permutations.