**Brief explanation of why the quadratic method(s) work :**

In Quadratic method we remove the duplicates by not considering the same value for the same index more than one time. (i.e., i or j or k should not refer to the same value in the array twice). let’s refer some value in array to ‘a’. once we have set the value of ‘a’ as i=a and find all b, c such that (a+b+c)=0, we no need to set the value to i once again for ‘a’. we can do this by sorting the array first and by skipping the duplicates in each loop.

For example:

S[] = [-1,1,0,2,-4,-1]

1. Sorted array

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| -4 | -1 | -1 | 0 | 1 | 2 |

↑i

2. once ‘I’ is pointed to -1 we can find the triplet -1, 0, -1 and also -1, -1, 2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| -4 | -1 | -1 | 0 | 1 | 2 |

↑ skipped ↑ i

3. when ‘i’ is pointed to next -1 we’ll find the same triplets. So, we skip the value and procced to next values

4. Then we will output all the triplets through a list.

**Here are the plots for Quadratic, Quadrithmic and cubic methods:**

1. Quadratic Approach:
2. Quadrithmic Approach
3. Cubic Approach