

# 3 Sum

Imp-

$n = 6$

0	1	2	3	4	5
-2	0	2	4	-2	-8

$$arr[i] + arr[j] + arr[k] = 0$$

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

$$target = -arr[k]$$

Step 1 Sort the arr

arr =

-8	-2	-2	0	2	4
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o/p  $\rightarrow$

-2, 0, 2
-2, -2, 4

```

public static void target(int arr[], int n){

    Arrays.sort(arr);

    for(int k = 0; k < n; k++){
        int i = k+1;
        int j = n - 1;
        int target = -1 * arr[k];
        while(i < j){
            int sum = arr[i] + arr[j];
            if(sum < target){
                i++;
            }
            else if(sum > target){
                j--;
            }
            else if(sum == target){
                System.out.println(arr[k] + " " + arr[i] + " " + arr[j]);
                i++;
                j--;
                while(i < j && arr[i] == arr[i-1]){
                    i++;
                }
                while(i < j && arr[j] == arr[j+1]){
                    j--;
                }
            }
        }
        while(k+1 < n && arr[k] == arr[k+1]){
            k++;
        }
    }
}

```

$$T.C \rightarrow O(n \log n) + n^2$$

$$T.C \cong O(n^2)$$

$$S.C \rightarrow O(1)$$

$$-2, 0, 2$$

$$-2 + 0 + \textcircled{2} = 0$$

$$\cancel{-2} + 0 = \cancel{-2} = 0$$

$$\boxed{-2 + 0} = \textcircled{-2}$$

$$-2 + 0 = 0$$

$$\underline{-2 + 0 = -2}$$

$$arr[i] + arr[j] + arr[k]$$

$$arr[i] + arr[j] = -arr[k]$$