

Task 1a: In this code I used two loops to check the combination for the sum which would match the required ~~out~~ sum. If it matches then it will write the output. Here time complexity is  $O(n^2)$ .

Task 1b: In this code I took two variable which would check from both sides to find the combination for the output. Here time complexity is  $O(N \log N)$ .

Task 2a: In this code I just ~~add the~~ added two sorted array into a big array and used ~~built in~~ builtin `sort()` function. Its complexity is  $O(N \log N)$ .

Task 2b: In this code I used ~~the~~ merge sort function to merge two array. In a loop, I checked for smaller values from two array and added to the new until I got a big sorted array. Time complexity is  $O(N)$ .

Task 3: In this code I used merge sort to solve the problem. Here if an array is broken until it has only one value then compare with other and finally added to the new array. It is based on divide and conquer. Time complexity of merge sort is  $O(\log N)$  and merge is  $O(N)$ . Total  $O(N \log N)$ .

Task 4: It is similar to task 3. I used merge sort to make the array smaller. After that I only added the largest value to the new list or array. Time complexity is  $O(\log N)$ .