

### Task: 1

Here I used merge sort. It divide the array into two and find the permutation of aliens height.

### Task: 2

Here I used a single while loop to find  $arr[i] + arr[j]^2$ . it is  $O(n)$ .

### Task: 3

Here Quick Sort and partition two ~~for~~ method represents a sorted array. partition method ensure that all the number are less than pivot and others are bigger than pivot. all less element sit before the pivot and bigger element sit after the pivot. it is  $O(n \log n)$  time complexity.

Task: 4 Here we use partition method  
of quick sort and find the  $k^{th}$   
smallest value. Here it is  $O(n)$   
complexity.