Task 1:
First I took a global variable c to count then I used merge sort technique to find pairs of aliens such that the condition match.

Task 2:
To find the maximum value I created a recursive function called get_max(). I set two base cases one is if the length of array is 1 then return minus infinity and if the length of array is 2 then it calculates the value. Then I used divide and conquer technique to find the desired value. Finally I took absolute value for the second part of the condition so that it square value gets maximum in total the function will return the max value.

Task 3:
Quick sort has 2 functions first one is Partition() and second one is Quick_sort(). In the partition function first it will select a random number as it's pivot in this case the pivot value is the last value of the array. Then there will be a variable i which will be p-1 after that a loop will run to check if the value of A[j] is less than or equal to pivot. If it is then those value will be swap and finally i+1 and pivot value will be swapped as well as will return i+1. Then Quick_sort() function will start, it checks it p which value is initially 0 is less than the last value of the array. If it is then partition function will be called then Quick_sort() will be recursively called for two times for two parts of the array. This is how it will sort the whole array in ascending order.

Task 4:
To find the k-th smallest number I have created a recursive function called find_kth_smallest. Here I set the base case if length of array is 1 then then return the value. If not then the first value of the array is saved in a variable called p. Then took two empty list to traverse and append if the current value is smaller than p in those empty list. Then there is recursive call based on some conditions. This is how we get the k-th smallest number.