In this exam, you are asked to complete the function definitions to sort the given array $**arr**$ with **descending** order.

- *Quicksort with Classical Partitioning*[30pts] is called using the function **quickSort()** with $**hoare**$**=false**. It should sort the array in **descending** order, count the number of $**swap**$ executed during sorting process, calculate the average distance between swap positions $**avg_dist**$, find the max distance between swap positions $**max_dist**$(which are all 0 if there are no swaps).
- *Quicksort with Hoare Partitioning*[30pts] is called using the function **quickSort()** with $**hoare**$**=true**. It should sort the array in **descending** order, count the number of $**swap**$ executed during sorting process, calculate the average distance between swap positions $**avg_dist**$, find the max distance between swap positions $**max_dist**$.
- *3-Way Quicksort*[40pts] is called using the function **quickSort3()**. It should sort the array in **descending** order, count the number of $**swap**$ executed during sorting process and count the number of $**comparison**$ executed during sorting proccess (Comparisons are only between the values to be sorted only, not your auxiliary comparisons) (which are all 0 if there are no swaps and comparisons).