

Q10. Quick sort / Max heap sort

For this problem, you need to implement quick sort and heap sort for integers.

In this lab, you need to build the project on your own, and we will give you the main.cpp file.

You can add any files or functions if you need.

Note that:

For the max heap sort, this question can be solved by array or linked list. Normally, array is more preferred. However, you can also use linked list to practice in this lab.

Input Format

The first line is the number of the test cases.

And then, the next two lines are one of the test cases.

The first line is the number of integers.

The second line is the value of integers.

See sample input for details.

Please implement the file I/O part.

Read the file to get input.

The file name should be "input1.txt".

DO NOT use any sort functions from the standard or other libraries.

If you use other ways to sort, your score will be 0.

Output Format

Show the sorted integer in increasing order.

See more detail from Sample output.

Sample Input (input.txt)

```
2
10
21 6 -5 9 4 26 -50 -70 64 99
10
10 9 8 7 6 5 4 3 2 1
```

Sample Output

Max Heap Sort : -70 -50 -5 4 6 9 21 26 64 99

Quick Sort : -70 -50 -5 4 6 9 21 26 64 99

Max Heap Sort : 1 2 3 4 5 6 7 8 9 10

Quick Sort : 1 2 3 4 5 6 7 8 9 10

Hint

For the quick sort, you can see the p02_06_Sorting.ppt from page 17 to page 53 or the link below.

https://www.tutorialspoint.com/data_structures_algorithms/quick_sort_algorithm.htm

For the max heap sort, you can see the link below.

https://www.tutorialspoint.com/data_structures_algorithms/heap_data_structure.htm