Lab8. Max Heap Sort

In this lab, you need to implement a heap sort for integers.
Note that:
1.Make sure you can read pseudocode. It will be very useful in the next few weeks.
2.This question can be solved by array or linked list. Normally, array is more prefered. However, you can also use linked list to practice this lab.

Input Format

Read file to get input.
The first line is the number of integer. The following lines are the value of integers.

Output Format

Show the sorted integer in descending order.

Sample Input

10
1 3 2 9 5 7 8 4 6 0

Output Input

9 8 7 6 5 4 3 2 1 0

Hint

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

Pseudo Code

```
Heapsort(A) {
   BuildHeap(A)
   for i <- length(A) downto 2 {
      exchange A[1] <-> A[i]
      heapsize <- heapsize -1
      Heapify(A, 1)
}

BuildHeap(A) {
   heapsize <- length(A)
   for i <- floor( length/2 ) downto 1
```

```
      Heapify(A, i)
}

Heapify(A, i) {
   le <- left(i)
   ri <- right(i)
   if (le<=heapsize) and (A[le]>A[i])
      largest <- le
   else
      largest <- i
   if (ri<=heapsize) and (A[ri]>A[largest])
      largest <- ri
   if (largest != i) {
      exchange A[i] <-> A[largest]
      Heapify(A, largest)
   }
}
```