Mergesort

Simple. Sort the numbers on the standard input using the merge sort algorithm. Don't try to cheat by just calling your build in functions... I can see your source.

Input

On the standard input you will receive N (1 <= N <= 100000). Each number will fit in 32-bit integer

Output

Output the same integers in a sorted manner. Smallest to largest.

Example

Input:
7 3 2 5 4 3

Output:
2 3 3 4 5 7