(1) You are given an array of N elements. Each element can be very large (<= 10^9). For every prefix of the array, print the number of distinct elements.
Your program must have time complexity of O(NlogN).

Sample Input
6
1 3 1 2 100 100

Sample Output

1 2 2 3 4 4

Explanation:

The prefixes and the number of distinct elements are as follows:

[1] : 1
[1, 3] : 2
[1, 3, 1] : 2
[1, 3, 1, 2] : 3
[1, 3, 1, 2, 100] : 4
[1, 3, 1, 2, 100, 100] : 4

(2) You have two arrays. The elements in each array are large (<= 10^9) and distinct. Find the elements that occur in both arrays. **Your program must have time complexity of O(NlogN).**

Sample Input
6
200 100 1000 10000 100000
7
100 2 3 200 100000 30 40

Sample Output
200 100 100000

Explanation:
A = [**200**, **100**, 1000, 10000, **100000**]
B = [**100**, 2, 3, **200**, **100000**, 30, 40]
Common elements are shown in bold above. [200, 100, 100000]

(3) There are N numbers on the whiteboard. You do the following until there are at least two numbers on the board.
   (a) At first you pick the smallest two numbers
   (b) Then you erase them from the board
   (c) Finally you write the sum of those numbers on the board

Print which numbers are erased at each step.

Your program's time complexity must be O(NlogN).

Sample Input	Sample Output
6	
3 7 2 7 3 3	
	2 3
	3 3
	5 6
	7 7
	11 14

Explanation:
Initial Numbers = [3, 7, 2, 7, 3, 3]

On the 1st step, you erase 2, 3 and add 2+3 = 5 on the board.
The board looks like, [7, 7, 3, 3, 5]

On the 2nd step, you erase 3, 3 and add 3+3 = 6 on the board.
The board looks like, [7, 7, 5, 6]

On the 3rd step, you erase 5, 6 and add 5+6 = 11 on the board.
The board looks like, [7, 7, 11]

On the 4th step, you erase 7, 7 and add 7+7 = 14 on the board.
The board looks like, [11, 14]

On the 5th step, you erase 11, 14 and add 11+14 = 25 on the board.
The board looks like, [25]

(4) You have a list of N movies. You know the durations of those movies in minutes. You want to watch **at most two different movies** but do not want to spend more than T minutes. Can you find what is the maximum time in minutes you can spend watching movies ? **You can assume that all the durations are distinct**.

Your program must have O(NlogN) time complexity.

First line contains N and T.
Then in the next line, there are N integers denoting the duration of the movies.

Sample Input   **Sample Output**

5 100
50 74 40 75 10

90

Explanation: You have 100 minutes to watch movies. The best option is to watch movies with duration 50 and 40.