**Merge sort**

**Description**

Write a program that sorts an array of integers using the [Merge sort](http://en.wikipedia.org/wiki/Merge_sort) algorithm.

**Input**

* On the first line you will receive the number **N**
* On the next **N** lines the numbers of the array will be given

**Output**

* Print the sorted array
  + Each number should be on a new line

**Constraints**

* 1 <= **N** <= 1024
* Time limit: **0.1s**
* Memory limit: **16MB**

**Sample tests**

| **Input** | **Output** |
| --- | --- |
| 6 **3 4 1 5 2 6** | 1 2 3 4 5 6 |
| 10 **36 10 1 34 28 38 31 27 30 20** | 1 10 20 27 28 30 31 34 36 38 |