K Smallest Sums

You're given k arrays, each array has k integers. There are k^k ways to pick exactly one element in each array and calculate the sum of the integers. Your task is to find the k smallest sums among them.

Input

There will be several test cases. The first line of each case contains an integer k (2<=k<=750). Each of the following k lines contains k positive integers in each array. Each of these integers does not exceed 1,000,000. The input is terminated by end-of-file (EOF). The size of input file does not exceed 5MB.

Output

For each test case, print the k smallest sums, in ascending order.

Sample Input

```
3
1 8 5
9 2 5
10 7 6
2
1 1
1 2
```

Sample Output

```
9 10 12
2 2
```