Lab Exam-2

C) Find the lost Message

Santa wrote a joke for Banta which consists of N numbers, M_i. Santa encrypted the joke using a key which again consists of N integers K_i so that anyone else can't read the joke. Encrypted joke contains N integers E_i where E_i is $M_i \oplus K_i$. He sent the encrypted joke and key to Banta, but Banta received the key elements in a jumbled order i.e. a permutation of array K.

Banta now wants to decrypt the joke, but realises it is impossible to do so. You need to find the lexicographically smallest joke that could have resulted in the encrypted joke.

Input

First line contains one integer N.
Next line contains N integers which is encrypted joke E_i.
Next line contains N integers which is key K_i.

Output

Output N integers, lexicographically smallest joke that could have resulted in the encrypted joke. Note: The numbers should lie within the range $[0, 2^{30} - 1]$ (both inclusive).

Constraints

$1 \leq N \leq 300000$, Length of joke
$0 \leq E_i < 2^{30}$ (Encrypted joke)
$0 \leq K_i < 2^{30}$ (Key)

Sample Input 1

```
3
8 4 13
17 2 7
```

Sample Output 1

```
10 3 28
```

Sample Explanation 1

The solution is (10,3,28). Since $(8 \oplus 2 = 10)$, $(4 \oplus 7 = 3)$, and $(13 \oplus 17 = 28)$ and . Other possible permutations of key yield messages (25,6,10), (25,3,15), (10,21,10), (15,21,15) and (15,6,28), which are all lexicographically larger than the solution.

Sample Input 2

```
5
12 7 87 22 11
18 39 9 12 16
```

Sample Output 2

0 14 69 6 44

Limits

Time: 3 second

Memory: 256 MB