Bonus Question (Afternoon lab) : Children & Shoes

N children have been playing in a swimming pool, after leaving their shoes at poolside. When it is time to leave, all the shoes look identical; the only way for a child to identify his/her shoes is to try one on (doesn't matter which one, left or right) and see if the shoe fits EXACTLY (neither too tight nor too loose). Assume that the foot-sizes of all the children are distinct. If two different shoes are too tight, he/she can't tell which one is tighter. Similarly, if two different shoes are too loose, the child cannot tell which one is looser.

Develop an efficient solution (with average complexity O(N lgN)) to match the children and the shoe array.

You're given two input arrays **C** and **S** each of length **N** where C[i] represents the ID of i^{th} child (note that it's the ID, and not foot size) and S[i] represents the model number of the i^{th} shoe (again note that it's the model number, NOT the shoe size). You're also provided with a comparison function **DoesFit (int s, int c)** which returns **-1** if the shoe with **s** as the model number is tight in the feet of child with ID as **c**, returns **0** if it fits and returns **1** if it is loose.

You're given a **template of the solution**. It is available here: foobar.iiitd.edu.in/bonus_template.c

You can make changes only in the section that's marked for changes. No changes can be made beyond the allowed region.
In the allowed segment, you should no where access A and B arrays. **They should mean nothing to you**. The only way to know if a shoe fits a child for you is by calling the DoesFit function.
You can use only the arrays that have been provided as the arguments to the findMatch function.
We will be verifying for this.

Input:
First line of the input will contain N, the number of children.
Each of the next 4 lines contain space-separated N numbers, with first line containing array **C**, second line containing array **S**, third line containing array **A**, and fourth line containing array **B**.

It is guaranteed that input will be valid (All C[i]s and S[i]s being distinct, and following the constraints). It is also guaranteed that input will be such that a perfect match for all children will exist.

Output:
Output will consist of N lines with each line representing the correct match of child with shoe (ID of child followed by model number of shoe, separated by a space).
The order of the output should be such that the child with the smallest shoe should appear first while the one with the largest shoe should appear at the end.

Constraints:
$1 \leq N \leq 10^6$
$0 \leq S[i], C[i] \leq N-1$
$1 \leq A[i], B[i] \leq 10^9$

Sample Input:
4
3 2 1 0
0 1 3 2
999 99 876 645
876 99 645 999

Sample Output:
1 1
3 2
2 0
0 3