

Beef Tripe in Soup Pot?

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 256 megabytes

Students at the Trellis Hot Pot School are currently engaged in a heated discussion about which ingredients can be cooked in which type of hot pot.

There are two types of hot pots: spicy hot pots and soup pots. There are n types of ingredients, numbered from 1 to n . The cooking times for the i -th ingredient in the spicy hot pot and soup pot are denoted as a_i and b_i , respectively (it is guaranteed that all a_i and b_i are distinct). Based on the discussion results, they have determined which ingredients can be cooked in each type of hot pot.

The students at the Trellis Hot Pot School have a unique way of eating hot pots. They will wait until all n types of ingredients are ready and then decide whether each ingredient should be placed in the spicy hot pot or soup pot. If an ingredient can be placed in both pots, they will choose to place it in the pot with the shorter cooking time. After the discussion, all ingredients are put into the regarding pot. Due to the exhausting discussion process, when an ingredient is cooked, they will immediately fish it out and eat it.

The students at the Trellis Hot Pot School want to know the order in which the ingredients are fished out from the spicy hot pot and soup pot, respectively. Please output the answers in the order of fishing out time.

Input

The first line contains an integer n ($2 \leq n \leq 10^5$), indicating the number of types of ingredients.

For the next n lines, the i -th line describes the i -th type of ingredients, which contains four integers representing the cooking time a_i in the spicy hot pot, cooking time b_i in the soup pot, whether the ingredient can be cooked in the spicy hot pot c_i , and whether the ingredient can be cooked in the soup pot d_i . Here, $1 \leq a_i, b_i \leq 2 \times n$, $c_i, d_i \in \{0, 1\}$. It is guaranteed that each ingredient can be cooked in at least one type of hotpot, and for any $1 \leq i, j \leq n$, it is guaranteed that $a_i \neq a_j$, $b_i \neq b_j$, and $a_i \neq b_j$.

Output

Output two lines.

The first line should start with a number k , representing the number of ingredients cooked in the spicy hot pot, followed by k integers representing the type of the ingredients in the spicy hot pot, sorted by cooking time, separated by spaces.

The second line should start with a number c , representing the number of ingredients cooked in the soup pot, followed by c integers representing the type of the ingredients in the soup pot, sorted by cooking time, separated by spaces.

Example

standard input	standard output
8	5 4 7 8 3 6
9 11 0 1	3 2 1 5
1 8 0 1	
15 7 1 0	
3 13 1 1	
6 12 0 1	
16 5 1 0	
4 2 1 0	
10 14 1 0	