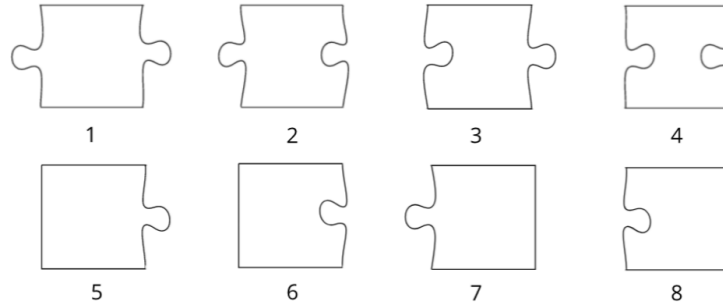




## Task Slagalica

Little Fabian got a one-dimensional jigsaw puzzle that consists of  $N$  pieces. He quickly realized that each piece belongs to one of the following types:



Additionally, it is known that among those  $N$  pieces there is exactly one piece of either type 5 or type 6 (left border) and exactly one piece of either type 7 or type 8 (right border).

Fabian wishes to arrange all of the pieces into a single row such that the first (leftmost) piece is of type 5 or 6 and the last (rightmost) piece is of type 7 or 8. Two pieces can be placed next to each other if and only if their neighbouring borders are of different shapes, i.e., one has a bump (also called *outie* or *tab*) and the other has a hole (also called *innie* or *blank*).

Simply solving the puzzle would be too easy for Fabian so he decided to write a unique positive integer on each of the pieces. Now he is interested in finding the lexicographically smallest solution to the jigsaw puzzle. The solution  $A$  is considered lexicographically smaller than solution  $B$  if at the first position (from the left)  $i$  where they differ it holds that the number written on  $i$ -th puzzle in  $A$  is smaller than the number written on  $i$ -th puzzle in  $B$ .

**Note:** the pieces cannot be rotated.

### Input

The first line contains an integer  $N$  ( $2 \leq N \leq 10^5$ ) from the task description.

The next  $N$  lines contain two integers  $X_i$  ( $1 \leq X_i \leq 8$ ) and  $A_i$  ( $1 \leq A_i \leq 10^9$ ) which represent the type of the  $i$ -th piece and the number Fabian wrote on it. All numbers  $A_i$  will be different.

### Output

If Fabian cannot solve the jigsaw puzzle, you should output  $-1$  in a single line.

Otherwise, you should output the numbers that are written on the pieces in the lexicographically smallest solution to the puzzle.

### Scoring

In test cases worth a total of 5 points it will hold  $N \leq 4$ .

In test cases worth additional 5 points it will hold  $N \leq 10$ .

In test cases worth additional 10 points pieces of types 2 and 3 will not appear in the input.

In test cases worth additional 20 points there will be at most one piece of type 1 or 4.

If for some test case in which the solution to the puzzle exists, you output the correctly solved puzzle but your solution is not lexicographically smallest, you will get 40% of the points intended for that test case.



## Examples

**input**

5  
1 5  
2 7  
2 3  
8 4  
6 1

**output**

1 3 7 5 4

**input**

3  
5 1  
7 2  
4 3

**output**

1 3 2

**input**

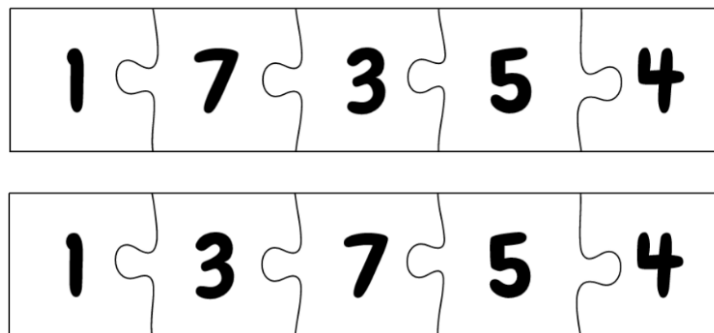
5  
2 5  
2 7  
2 3  
8 4  
6 1

**output**

-1

### Clarification of the first example:

There are only two possible solutions to the puzzle:



We can see that the second depicted solution has a smaller number written on the second piece. Therefore, that is the lexicographically smallest solution.