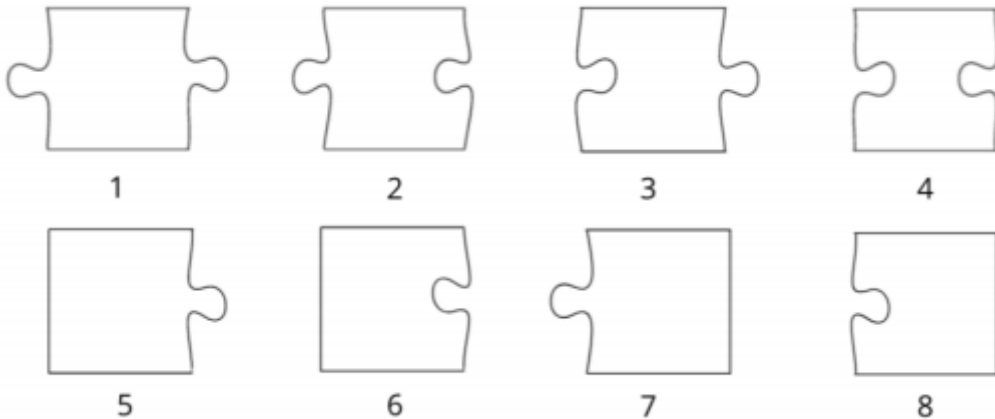# COCI '19 Contest 2 #2 Slagalica

Time limit: 1.0s   **Memory limit:** 512M

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.
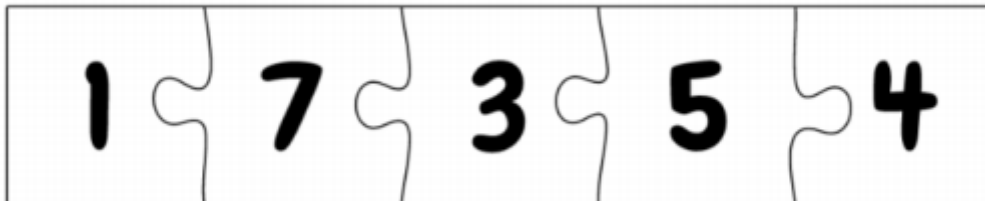
Sample Input 1

```
5
1 5
2 7
2 3
8 4
6 1
```

Sample Output 1

```
1 3 7 5 4
```

Explanation For Sample 1

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.

Sample Input 2

```
3
5 1
7 2
4 3
```

Sample Output 2

```
1 3 2
```

Sample Input 3

```
5
2 5
2 7
2 3
8 4
6 1
```

Sample Output 3

```
-1
```