## 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 $N\left(2 \leq N \leq 10^{5}\right)$ from the task description.
The next $N$ lines contain two integers $X_{i}\left(1 \leq X_{i} \leq 8\right)$ and $A_{i}\left(1 \leq A_{i} \leq 10^{9}\right)$ 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 | input | input |
| :---: | :---: | :---: |
| 5 | 3 | 5 |
| 15 | 51 | 25 |
| 27 | 72 | 27 |
| 23 | 43 | 23 |
| 84 |  | 84 |
| 61 | output | 61 |
| output | 132 | output |
| 13754 |  | -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.

