



## Task Matching

You are given  $N$ , where  $N$  is even, points on a plane that have integer coordinates. For each integer  $a$ , there are at most two points with coordinates  $(a, x)$ . Analogously, for each integer  $b$ , there are at most two points with coordinates  $(x, b)$ .

You are able to draw horizontal or vertical line segments between pairs of given points. Is it possible to draw  $\frac{N}{2}$  lines such that each of the given points is an endpoint of exactly one line segment and that no two line segments intersect?

### Input

The first line contains an even integer  $N$  ( $2 \leq N \leq 100\,000$ ) from the task description.

The  $i$ -th of the next  $N$  lines contains two integers  $X_i, Y_i$  ( $1 \leq X_i, Y_i \leq 100\,000$ ), coordinates of the  $i$ -th point.

### Output

If it is not possible to draw the line segments as explained in the task statement, you should output **"NE"** (NO in Croatian) in a single line.

Otherwise, you should output **"DA"** (YES in Croatian) in the first line. In each of the next  $\frac{N}{2}$  lines you should output two space-separated integers  $i$  and  $j$  ( $1 \leq i, j \leq N$ ), which represent indices of the points that are connected with a drawn line segment.

### Scoring

Subtask	Score	Constraints
1	5	$2 \leq N \leq 20$ , for each integer $a$ , there is an even number of points with coordinates $(a, x)$ and an even number of points with coordinates $(x, a)$ .
2	6	$2 \leq N \leq 20$
3	7	$2 \leq N \leq 40$
4	40	$2 \leq N \leq 2000$
5	52	No additional constraints.



## Examples

**input**

8  
1 1  
1 3  
2 2  
2 4  
3 1  
3 3  
4 2  
4 4

**output**

DA  
1 5  
3 7  
2 6  
4 8

**input**

6  
1 2  
1 3  
2 1  
2 4  
3 2  
3 3

**output**

DA  
1 2  
3 4  
5 6

**input**

2  
1 1  
2 2

**output**

NE