Problem H. Galactic Governments

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

Currently, there are n galactic governments in the k-dimensional cubic universe. The universe is a cube with two opposite vertices $(0, \ldots, 0)$ and $(C, \ldots, C)$ and sides parallel to coordinate axes. Formally, the set of points in the universe is

$$U = \{(x_1, \ldots, x_k) \in \mathbb{R}^k : 0 \le x_i \le C\}.$$

Each galactic government claims that its territory is a parallelepiped with sides parallel to coordinate axes. The i-th government claims a parallelepiped with two opposite vertices $(a_{i,1}, \ldots, a_{i,k})$ and $(b_{i,1}, \ldots, b_{i,k})$ such that $a_{i,j} < b_{i,j}$ for all j. Formally, the i-th government claims the set of points

$$G_i = \{(x_1, \ldots, x_k) \in U : a_{i,j} \le x_j \le b_{i,j}\}.$$

Note that some pieces of territory can be claimed by multiple governments.

Rick tries to find a point which is not claimed by any of the galactic governments. He has noticed that $a_{i,j}$ is an integer for all i from 1 to n and all j from 1 to k. Rick knows that it implies that an unclaimed point exists if and only if there exists an unclaimed point $\left(\alpha_1 + \frac{1}{2}, \alpha_2 + \frac{1}{2}, \ldots, \alpha_k + \frac{1}{2}\right)$ where α_i *are all integers*. Rick likes integers, so he asks you to find $\alpha_1, \ldots, \alpha_k$ such that $\left(\alpha_1 + \frac{1}{2}, \alpha_2 + \frac{1}{2}, \ldots, \alpha_k + \frac{1}{2}\right)$ is a point in the universe and it does not belong in any of the $G_1, \ldots, G_n$. If there are multiple such points, Rick wants to find the lexicographically smallest one.

Point $\left(\beta_1 + \frac{1}{2}, \ldots, \beta_k + \frac{1}{2}\right)$ is lexicographically smaller than $\left(\gamma_1 + \frac{1}{2}, \ldots, \gamma_k + \frac{1}{2}\right)$ if there exists such j $(1 \le j \le k)$ such that for all $i < j$ we have $\beta_i = \gamma_i$, and $\beta_j < \gamma_j$.

Input

The first line contains three integers n, k, and C ($1 \le n \le 18$, $1 \le k \le 10$, $1 \le C \le 1000$). The i-th of the next n lines contains $2k$ integers: $a_{i,1}, \ldots, a_{i,k}$, $b_{i,1}, \ldots, b_{i,k}$ ($0 \le a_{i,j} < b_{i,j} \le C$ for every j from 1 to k).

Output

Print "NO" if all points in the universe are claimed by galactic governments. Otherwise, print "YES" on the first line, and on the second line, print k integers $\alpha_1, \ldots, \alpha_k$ such that $\left(\alpha_1 + \frac{1}{2}, \alpha_2 + \frac{1}{2}, \ldots, \alpha_k + \frac{1}{2}\right)$ is a point in the universe and it does not belong in any of the $G_1, \ldots, G_n$. If there are multiple solutions, print the lexicographically smallest one.

Examples

standard input	standard output
2 2 3 0 0 2 2 1 1 3 3	YES 0 2
1 3 5 0 0 0 5 5 5	NO