Chess

SEASON 10 - SIXTH ROUND

Dinko likes to play chess. Also, he likes to do programming. That's why he decided to write a program that plays chess. However, he finds the game on an 8 by 8 board too simple, so he uses an infinite one instead. The first task he faced is to check whether the king is in check. Dinko doesn't know how to implement this so he asks you to help.

Consider that an infinite chess board contains one white king and a number of black pieces. There are only rooks, bishops and queens, as the other pieces are not supported yet. The white king is said to be in check if at least one black piece can reach the cell with the king in one move. Help Dinko and write a program that for a given position determines whether the white king is in check.

Reminder, on how chess pieces move:
- Bishop moves any number of cells diagonally, but it can't "leap" over occupied cells.
- Rook moves any number of cells horizontally or vertically, but it also can't "leap" over occupied cells.
- Queen is able to move any number of cells horizontally, vertically or diagonally, but it also can't "leap".

Input (chess.in)
The first line of the input contains a single integer n — the number of black pieces. The second line contains two integers x_0 and y_0 — coordinates of the white king. Then, n lines follow, each of them contains a character and two integers x_i and y_i — the type of the i-th black piece and its position. Character 'B' stands for bishop, 'R' for rook and 'Q' for queen. It's guaranteed that no two pieces occupy the same position.
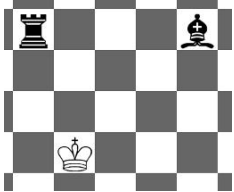
Output (chess.out)
The only line of the output should contain "YES" (without quotes) if the white king is in check and "NO" (without quotes) otherwise.

Constraints
$1 \le n \le 500\ 000$
$-10^9 \le x_0, y_0, x_i, y_i \le 10^9$

Examples

Input	Output	Picture	Input	Output	Picture
2 4 2 R 1 1 B 1 5	YES		2 4 2 R 3 3 B 1 5	NO	