

Simplified Chess Engine



Chess is a very popular game played by hundreds of millions of people. Nowadays, we have chess engines such as [Stockfish](#) and [Komodo](#) to help us analyze games. These engines are very powerful pieces of well-developed software that use intelligent ideas and algorithms to analyze positions and sequences of moves, as well as find tactical ideas. Consider the following *simplified version of chess*:

- **Board:** It's played on a 4×4 board between two players named *Black* and *White*.
- **Pieces and Movement:**
 - White initially has w pieces and Black initially has b pieces.
 - There are no Kings and no Pawns on the board. Each player has exactly *one* Queen, at most *two* Rooks, and at most *two* minor pieces (i.e., a Bishop and/or Knight).
 - Each piece's possible moves are the same as in classical chess, and each move made by any player counts as a single move.
 - There is no draw when positions are repeated as there is in classical chess.
- **Objective:** The goal of the game is to capture the opponent's Queen without losing your own.

Given m and the layout of pieces for g games of simplified chess, implement a very basic (in comparison to the real ones) engine for our simplified version of chess with the ability to determine whether or not White can win in $\leq m$ moves (regardless of how Black plays) if White always moves first. For each game, print **YES** on a new line if White can win under the specified conditions; otherwise, print **NO**.

Input Format

The first line contains a single integer, g , denoting the number of simplified chess games. The subsequent lines define each game in the following format:

- The first line contains three space-separated integers denoting the respective values of w (the number of White pieces), b (the number of Black pieces), and m (the maximum number of moves we want to know if White can win in).
- The $w + b$ subsequent lines describe each chesspiece in the format $t\ c\ r$, where t is a character $\in \{Q, N, B, R\}$ denoting the type of piece (where Q is Queen, N is Knight, B is Bishop, and R is Rook), and c and r denote the respective column and row on the board where the figure is placed (where $c \in \{A, B, C, D\}$ and $r \in \{1, 2, 3, 4\}$). These inputs are given as follows:
 - Each of the w subsequent lines denotes the type and location of a White piece on the board.
 - Each of the b subsequent lines denotes the type and location of a Black piece on the board.

Constraints

- It is guaranteed that the locations of all pieces given as input are distinct.
- $1 \leq g \leq 200$
- $1 \leq w, b \leq 5$
- $1 \leq m \leq 6$
- Each player initially has exactly one Queen, at most two Rooks and at most two minor pieces.

Output Format

For each of the g games of simplified chess, print whether or not White can win in $\leq m$ moves on a new line. If it's possible, print **YES**; otherwise, print **NO**.

Sample Input 0

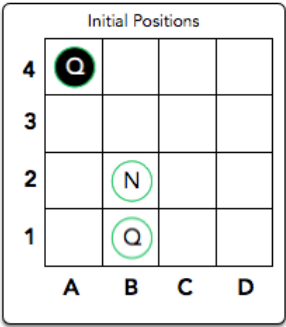
```
1
2 1 1
N B 2
Q B 1
Q A 4
```

Sample Output 0

```
YES
```

Explanation 0

We play $g = 1$ games of simplified chess, where the initial piece layout is as follows:



White is the next to move, and they can win the game in 1 move by taking their Knight to ~~A~~4 and capturing Black's Queen. Because it took 1 move to win and $1 \leq m$, we print YES on a new line.