Coding Area

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Minimum Queens

Problem Description

Imagine a chess board of size N x N where M Queens are placed on the chess board at different squares (i, j) where i is the row and j is the column. Pick a queen that can attack maximum other queens. If a queen is attacked it goes off the board. Minimize number of queens that remain on the board.

A Queen can move diagonally, horizontally and vertically.

A Queen can be moved only to attack another Queen and the path completes once this Queen cannot attack any other Queen on the board

Your aim is to print the minimum number of Queens that can remain on the board after choosing one path.

Constraints

3 <= N <= 50 1 <= M <= (N*N)

Input Format

First line contains two integers, N (size of board) and M (number of queens) delimited by comma (,)

Next M Lines, contain two integers and a string representing the coordinates of the position of queens and the name of the queen. For example 8,8,Q1, Here 8,8 is the position of Q1.

Refer diagrams in Example section for understanding the coordinate system of the board. Top left corner of the board is (1, 1) and bottom right is (N, N).

Output

One line containing minimum number of Queens that can remain on the board after all the possible attacks in one path are completed

Test Case

Explanation

Example 1

Input

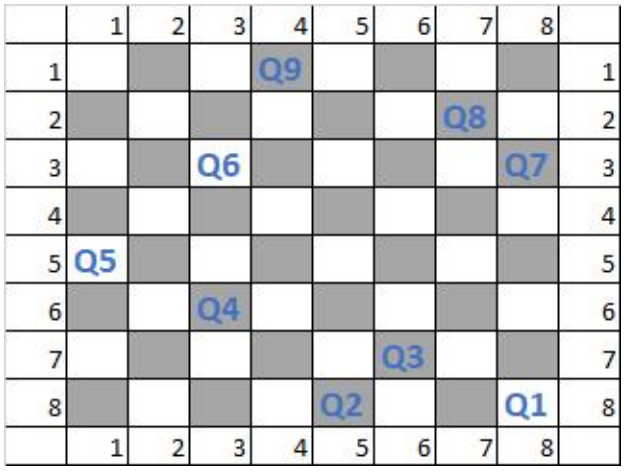
8,9 8,8,Q1 8,5,Q2 7,6,Q3 6,3,Q4 5,1,Q5 3,3,Q6 3,8,Q7 2,7,Q8 1,4,Q9

Output

2

Explanation

There are total 9 Queens in the given scenario. **If you pick Q1,** It can kill 2 queens, if Path#1 (Q1 ==> Q6 ==> Q5) is followed It can kill 5 queens, if Path#2 (Q1 ==> Q7 ==> Q6 ==> Q4 ==> Q2 ==> Q3) is followed **If you pick Q3,** It can kill 7 queens, if Path#3 (Q3 ==> Q2 ==> Q1 ==> Q7 ==> Q8 ==> Q4 ==> Q6 ==> Q5) is followed Similarly, there can arise 'n' number of different paths if different Queens are chosen. The best path here is Path#3 that can kill 7 Queens & leaves only 2 queens on the board. So, 2 is the answer.



Input

8,6 8,8,Q1 8,5,Q2 7,6,Q3 5,1,Q6 3,1,Q5 1,3,Q4

Output

4

Explanation

Path#1 - Q1 -> Q2 -> Q3 Path#2 - Q4 -> Q5 -> Q6 But not both of them. After choosing either of the path, 1 + 3(from other path) remain on the table. So Answer here is 4.