Students
Problem ID: students

It's time for lunch break at a certain school, and the n^2 students are out and about in the playground. This playground is an $n \times n$ grid, and there is one student standing on each cell of the grid. Since the students have been playing and chatting with each other for awhile, some m pairs of adjacent (cells sharing an edge) students have become friends. The teacher wants to take some of the students on a field trip, but does not want it to be too rowdy, so no student on the field trip can be friends with any other student on the trip.

Write a program to find the maximum number of students the teacher can take on the field trip.

Input

Your program will receive input from standard input.

The first line of the input contains two space-separated integers, n and m.

m lines follow. The i-th line contains 4 space separated integers $x_{i,1}, y_{i,1}, x_{i,2}, y_{i,2}$ indicating that the student located in row $x_{i,1}$, column $y_{i,1}$ and the student located in row $x_{i,2}$, column $y_{i,2}$ are friends.

Output

Your program should write to standard output.

Print exactly one line containing the maximum number of students the teacher can take on the field trip.

Constraints

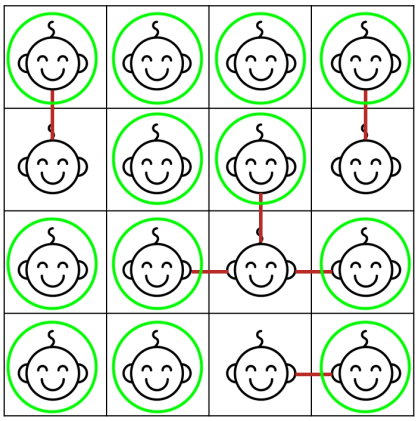
- $2 \leq n \leq 3 \cdot 10^3$
- $0 \leq m \leq \min(2n(n-1), 2 \cdot 10^5)$
- $1 \leq x_{i,1}, y_{i,1}, x_{i,2}, y_{i,2} \leq n$
- $|x_{i,1} - x_{i,2}| + |y_{i,1} - y_{i,2}| = 1$

Subtasks

You will get points for each subtask when you pass all of the testcases of the subtask.

1. $n \leq 5$ (21 points)
2. $n \leq 100$ (26 points)
3. No additional constraints (53 points)

Sample Explanation



This image illustrates the sample Input/Output. Friendships are indicated by the red lines. The students circled in green illustrate one possible optimal group the teacher could choose to take on the field trip.

Sample Input 1	Sample Output 1
4 6 3 2 3 3 3 3 3 4 4 3 4 4 1 1 2 1 1 4 2 4 2 3 3 3	12