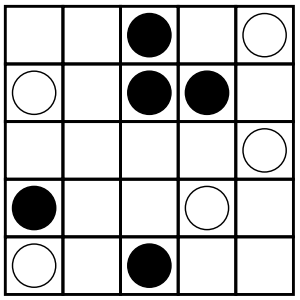
Problem G

Go−−

Go−− is similar do the traditional game of Go, but it is much simpler! It is played on a square grid of dimension N, initially empty, where two players, one playing with the black stones and the other with the white ones, alternate placing one stone at a time on any of the unoccupied cells. The match ends after each player has placed P stones on the grid. Consider all possible square subgrids of dimensions 1 to N. A square subgrid belongs to the player with the black stones if it contains at least one black stone and no white stones. A square subgrid belongs to the player with the white stones if it contains at least one white stone and no black stone. Note that some subgrids do not belong to any player. Those having no stone at all, or stones of both color.



In this problem, given the final position of the grid, your program has to compute how many square subgrids belong to each player, so we can know who won the match. In the picture, the player who plays with the black stones has 12 subgrids (five of dimension 1, six of dimension 2 and one of dimension 3). The player with the whites stones, who lost the match, has 10 subgrids.

Input

The first line of the input contains two integers N and P, $2 \leq N \leq 500$, $1 \leq P \leq 500$ and $P \leq N^2/2$, representing, respectively, the dimension of the grid and the number of stones each player has placed. Each one of the next P lines contains two integers X and Y defining the coordinates of the black stones. Then, each one of the following P lines contains two integers X and Y defining the coordinates of the white stones. All stones are placed at distinct cells.

Output

Output one line containing two integers indicating how many square subgrids belong to the player with black stones and how many to the player with the white stones.

Examples

Examples

Input	Output
2 1 1 1 2 2 5 5 1 3 2 3 2 4 4 1 5 3 1 5 2 1 3 5 4 4 5 1 500 3 500 498 500 499 500 500 120 124 251 269 499 498	1 1 12 10 4 12463784