Problem: QRC
QR Codes

The Mayor of Limonia is a great fan of all sorts of computer novelties. Lately he noticed that there are more and more QR codes (*Quick Response*) appearing around him. After looking into the topic, he decided to use these codes for encoding the numbers of official letters. Your team got the opportunity to prove yourselves in front of the Mayor by writing generator for such codes.

QR code is a square with side length of n, divided into $n \times n$ cells. Every cell can be either bright or dark (which carries one bit of information). Not all of the layouts of bright and dark cells are equally easily recognizable by decoding algorithm. In particular, large groups of cells of the same brightness are undesirable. Therefore, the specification of the QR codes defines the set of masks that can be applied to the generated code — such a mask changes the brightness of selected cells. In order to estimate how well certain mask works, a metric has been implemented. It penalizes undesirable layouts of cells. To determine the metric, one should, among other things, sum up all the areas of all rectangles consisting of cells of the same brightness.

It turns out not to be such an easy task. Peeping at competitors' solutions did not help either — it appears that available implementations can only give an approximate metric by counting only the rectangles with sizes of 2×2. The Mayor does not agree to half-measures and requires full implementation of the specification. Convince him that you are ready to face this challenge!

Input

In the first line of the input file there are two integers n and m ($1 \leqslant n \leqslant 20\,000$, $0 \leqslant m \leqslant 200\,000$) which specify the square side length and the number of dark cells. In the next m lines there are descriptions of the dark cells: in the i-th line there are two integers w_i and k_i ($1 \leqslant w_i, k_i \leqslant n$) which specify the row and the column of the i-th dark cell. Every cell appears in the file no more than once.

Output

The output file should contain one integer that will convince the Mayor about your competence. It is supposed to be the remainder of dividing the number of the all summed up areas of one-coloured rectangles by $1\,000\,000\,007$.
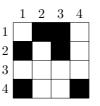
Scoring

Scoring of this problem is binary; in case of the correct answer, the score for a test is 1. The percentage of guaranteed points is 50%.

Example

For the input data:

```
4 6
1 2
1 3
2 1
2 3
4 1
4 4
```

	1	2	3	4
1		■	■	
2	■		■	
3				
4	■			■

the correct result is:

```
58
```

Explanation of the example: The total area of dark rectangles is 10 (6 rectangles with area of 1 and 2 rectangles with area of 2), and the area of bright rectangles equals 48.