

New Equipments III

Input file: **standard input**
Output file: **standard output**
Time limit: 4 seconds
Memory limit: 512 megabytes

Little Q's factory recently purchased n pieces of new equipment, labeled by $1, 2, \dots, n$.

There are n workers in the factory, labeled by $1, 2, \dots, n$. Each worker can be assigned to no more than one piece of equipment, and no piece of equipment can be assigned to multiple workers. If Little Q assigns the i -th worker to the j -th piece of equipment, they will bring $p_{i,j}$ profits. However, these workers are not so experienced, so most of the values in matrix p are equal to zero, except m cells. You will be given these m cells.

Now please for every k ($1 \leq k \leq n$) find k pairs of workers and pieces of equipment, then assign workers to these pieces of equipment, such that the total profits for these k pairs are maximized.

Input

The input contains only a single case.

The first line contains two integers n and m ($1 \leq n \leq 50\,000$, $1 \leq m \leq 200\,000$), denoting the number of workers/pieces of new equipment and the number of special cells in p .

Each of the following m lines contains three integers u_i, v_i and w_i ($1 \leq u_i, v_i \leq n$, $1 \leq w_i \leq 5$), denoting the $p_{u_i, v_i} = w_i$. Each pair of u_i and v_i will be described at most once.

Output

Output n lines, the k -th ($1 \leq k \leq n$) of which containing an integer, denoting the maximum possible total profits for k pairs of workers and pieces of equipment.

Examples

standard input	standard output
2 3 1 1 4 1 2 2 2 1 3	4 5
2 3 1 1 5 1 2 2 2 1 2	5 5