Problem C. New Equipments III

Input file:	*standard input*
Output file:	*standard output*
Time limit:	4 seconds
Memory limit:	1024 mebibytes

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

There are n workers in the factory, labeled by $1, 2, \ldots, n$. 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 $(1 \le k \le n)$ 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 $(1 \le n \le 50\,000,\ 1 \le m \le 200\,000)$, 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 $(1 \le u_i, v_i \le n,\ 1 \le w_i \le 5)$, 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 $(1 \le k \le n)$ 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