B. Sereja and Tree

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Sereja adores trees. Today he came up with a revolutionary new type of binary root trees.

His new tree consists of n levels, each vertex is indexed by two integers: the number of the level and the number of the vertex on the current level. The tree root is at level 1, its index is $(1, 1)$. Here is a pseudo code of tree construction.

```
//the global data are integer arrays cnt[], left[][], right[][]

cnt[1] = 1;
fill arrays left[][], right[][] with values -1;
for(level = 1; level < n; level = level + 1){
    cnt[level + 1] = 0;
    for(position = 1; position <= cnt[level]; position = position + 1){
        if(the value of position is a power of two){ // that is, 1, 2, 4, 8...
            left[level][position] = cnt[level + 1] + 1;
            right[level][position] = cnt[level + 1] + 2;
            cnt[level + 1] = cnt[level + 1] + 2;
        }else{
            right[level][position] = cnt[level + 1] + 1;
            cnt[level + 1] = cnt[level + 1] + 1;
        }
    }
}
```

After the pseudo code is run, cell `cnt[level]` contains the number of vertices on level $level$. Cell `left[level][position]` contains the number of the vertex on the level $level + 1$, which is the left child of the vertex with index $(level, position)$, or it contains -1, if the vertex doesn't have a left child. Similarly, cell `right[level][position]` is responsible for the right child. You can see how the tree with $n = 4$ looks like in the notes.

Serja loves to make things complicated, so he first made a tree and then added an empty set $A(level, position)$ for each vertex. Then Sereja executes m operations. Each operation is of one of the two following types:

- The format of the operation is "$1\ t\ l\ r\ x$". For all vertices $level, position$ $(level = t;\ l \le position \le r)$ add value x to set $A(level, position)$.
- The format of the operation is "$2\ t\ v$". For vertex $level, position$ $(level = t, position = v)$, find the union of all sets of vertices that are in the subtree of vertex $(level, position)$. Print the size of the union of these sets.

Help Sereja execute the operations. In this problem a set contains only distinct values like std::set in C++.

Input

The first line contains integers n and m $(1 \le n, m \le 7000)$.

Next m lines contain the descriptions of the operations. The operation of the first type is given by five integers: $1\ t\ l\ r\ x$ $(1 \le t \le n;\ 1 \le l \le r \le cnt[t];\ 1 \le x \le 10^6)$. The operation of the second type is given by three integers: $2\ t\ v$ $(1 \le t \le n;\ 1 \le v \le cnt[t])$.

Output

For each operation of the second type, print the answer on a single line.

Examples

input
4 5 1 4 4 7 1 1 3 1 2 2 2 1 1 2 4 1 2 3 3

output
2 0 1

Note

You can find the definitions that are used while working with root trees by this link: http://en.wikipedia.org/wiki/Tree_(graph_theory)

You can see an example of a constructed tree at $n = 4$ below.