



8301 Harry Potter and The Vector Spell

Harry Potter has found another strange spell in Half-blood Prince diary, that could generate a different binary vector of size M . As he is not the best magician, this spell does not work perfectly so he could generate only vectors where exactly 2 elements are non zero.

Harry has used this spell N times and he has constructed a matrix of M rows and N columns, where all generated vectors are columns.

Now Harry has a class of Magical Matrix Theory, where the professor asked him to calculate the rank of such a matrix. You are here to help him!

Operations in Magical Matrix Theory satisfied next rules:

+	0	1
0	0	1
1	1	0

*	0	1
0	0	0
1	0	1

The rank of a matrix A corresponds to the maximal number of linearly independent columns of A . The vectors in a set $T = \{\vec{v}_1, \vec{v}_2, \dots, \vec{v}_k\}$ are said to be linearly independent if the equation

$$a_1 \vec{v}_1 + a_2 \vec{v}_2 + \dots + a_k \vec{v}_k = \vec{0},$$

where $a_i = \{0, 1\}$ for $i = 1, \dots, k$ can only be satisfied by $a_i = 0$ for $i = 1, \dots, k$.

Input

The input file contains several test cases, each of them as described below.

On the first line two integers — M (size of vectors) and N (number of vectors generated by Harry).

Each of the next M lines has the format: $k_i c_1 c_2 \dots c_{k_i}$, where k_i is the number of non-zero elements in row i . The next k_i numbers are column indexes ($1 \leq c_j \leq N$, $j = 1, \dots, k_i$), which are non-zero in this row. For more details, see examples.

Constraints:

- $1 \leq N \leq 10^5$
- $1 \leq M \leq 10^5$
- $0 \leq k_i \leq N$

Output

For each test case, on a line by itself, write to the output the rank of the corresponding matrix.

Note for the Sample:

In first example, Harry has generated 3 vectors:

$$\vec{v}_1 = (1, 1, 0), \vec{v}_2 = (0, 1, 1), \vec{v}_3 = (1, 0, 1)$$

and the matrix is:

$$\begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 0 \\ 0 & 1 & 1 \end{bmatrix}$$

But $\vec{v}_1 + \vec{v}_2 + \vec{v}_3 = 0$.

Sample Input

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

Sample Output

```
2
3
```