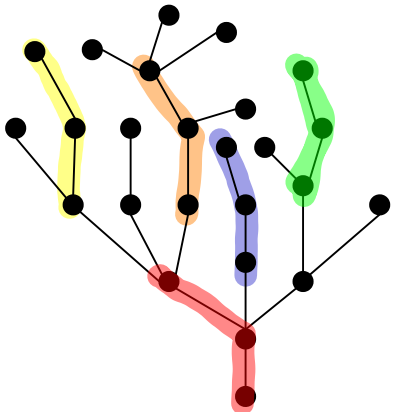
D - Tree Painting

Source file name: `tree.py`
Time limit: 1 second

Elisa got tired of drawing trees on paper and decided to paint real ones. With 'little' help from her dad (he will be the one actually doing the tree climbing and painting), she plans on coloring the almond tree in backyard.

The overall goal can be explained on a rooted tree T, where each node corresponds to a tree joint and an edge corresponds to a part of the trunk connected between two joints. The painting of the tree converges as it goes down from the leaves, leading to a unique joint, represented by the root of T. Elisa decided to enforce the following rule: to color exactly k consecutive nodes (in a path to the root) with a given color. The coloring can begin at any node. However, no two colors are allowed for a node. Therefore, the painting of two paths is necessarily disjoint because a colored path cannot intersect another one. For example, consider the tree depicted below with 5 disjoint colored paths of length $k = 2$.



Given the description of a tree T and the length k of the paths to paint each with a different color, your task is to determine the maximum number of disjoint paths in T of length k. The answer is 6 for the tree above.

Input

The input consists of several test cases. Each test case begins with a line containing three blank-separated integers N, M, and k ($1 \leq N \leq 10^4$, $0 \leq M < N$, and $1 \leq k \leq 10^4$) denoting the number of nodes in T, the number of lines to follow in the test case, and the length of the paths to paint, respectively. Each of the following M lines contains a list of blank-separated integers of the form $n\ c_1\ \cdots\ c_m$ ($0 \leq n < N$, $0 \leq c_i < N$, $c_i \neq n$ for $i = 1, \ldots, m$) defining that the children of n in T are the nodes $c_1, \ldots, c_m$. You can assume that the root of T is the node 0, and that the input of each test case represents a tree.

The input must be read from standard input.

Output

For each test case, output a single line with the maximum number of disjoint paths in T of length k.

The output must be written to standard output.

Sample Input	**Sample Output**
25 14 2 0 1 1 2 3 4 2 5 6 3 7 6 11 12 4 8 9 10 7 13 8 14 9 15 10 17 16 11 18 14 19 20 16 21 20 22 23 24	6