Problem L. Tree

Consider a un-rooted tree T which is not the biological significance of tree or plant, but a *tree* as an undirected graph in graph theory with n nodes, labelled from 1 to n. If you cannot understand the concept of a tree here, please omit this problem.

Now we decide to colour its nodes with k distinct colours, labelled from 1 to k. Then for each colour $i = 1, 2, \cdots, k$, define E_i as the minimum subset of edges connecting all nodes coloured by i. If there is no node of the tree coloured by a specified colour i, E_i will be empty.

Try to decide a colour scheme to maximize the size of $E_1 \cap E_2 \cdots \cap E_k$, and output its size.

Input

The first line of input contains an integer T ($1 \leq T \leq 1000$), indicating the total number of test cases.

For each case, the first line contains two positive integers n which is the size of the tree and k ($k \leq 500$) which is the number of colours. Each of the following $n-1$ lines contains two integers x and y describing an edge between them. We are sure that the given graph is a tree.

The summation of n in input is smaller than or equal to 200000.

Output

For each test case, output the maximum size of $E_1 \cap E_1 \cdots \cap E_k$.

Sample

3 4 2 1 2 2 3 3 4 4 2 1 2 1 3 1 4 6 3 1 2 2 3 3 4 3 5 6 2	1 0 1

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