

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 $i = 1, 2, \dots, k$, 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	1
4 2	0
1 2	1
2 3	
3 4	
4 2	
1 2	
1 3	
1 4	
6 3	
1 2	
2 3	
3 4	
3 5	
6 2	