Whose Land?

Input file:	`standard input`
Output file:	`standard output`
Time limit:	5 seconds
Memory limit:	1024 megabytes

Little Cyan Fish, also known as Xiao Qingyu, is the president of the Memoria Land. The Memoria Land consists of n cities, labeled by the integers from 1 to n. There are $n-1$ roads, where the i-th road connects cities u_i and v_i. It is guaranteed that for any two cities there is a path connecting them. In other words, the Memoria Land can be treated as a tree with n vertices. The distance between two cities x and y, denoted by $dis(x, y)$, is defined as the number of edges in the shortest path connecting these two cities. Specially, we have $dis(x, x) = 0$, as an empty path will meet the requirement.

As the anniversary of Memoria Land draws near, Little Cyan Fish is planning to show movies in selected cities to commemorate this special time. For the residents of city x, they can travel to city y to see a movie if and only if the city y is showing movies, and $dis(x, y) \leq k$.

Now the Little Cyan Fish wishes to make plans to show the movie. He has a total of q questions, and for the i-th question, he wants to know how many cities will be able to see the movie, if the movies are shown in all cities numbered from l_i to r_i.

Well, ah, handling all the tasks on the Memoria Land had made the Little Cyan Fish so tired that he no longer had the strength to answer these questions. Please help the Little Cyan Fish by answering all these questions.

Input

There are multiple test cases in a single test file. The first line of the input contains a single integer T ($1 \leq T \leq 10^5$), indicating the number of test cases.

For each test case, the first line of the input contains three integers n, k, and q ($1 \leq n \leq 10^5$, $1 \leq k \leq 20$, $1 \leq q \leq 5 \times 10^5$).

For the following $(n-1)$ lines, the i-th line contains two integers u_i and v_i ($1 \leq u_i, v_i \leq n$), indicating an edge connecting vertices u_i and v_i in the tree.

The next q lines describes all the queries. The i-th line of these lines contains two integers l_i and r_i ($1 \leq l_i \leq r_i \leq n$), indicating a query.

It is guaranteed that:

- The sum of n over all test cases does not exceed 5×10^5.

- The sum of q over all test cases does not exceed 5×10^5.

- The sum of $n \cdot k$ over all test cases does not exceed 2×10^6.

Output

For each query, output a single line contains a single integer, indicating the answer.

Example

standard input	standard output
2	4
5 1 2	5
1 2	7
1 3	8
2 4	6
2 5	
2 2	
2 3	
8 2 3	
1 2	
1 3	
2 4	
2 5	
4 6	
5 7	
7 8	
2 2	
2 5	
3 4	