

## Problem C. Tree Circles

Input file: *standard input*  
 Output file: *standard output*  
 Time limit: 2 seconds  
 Memory limit: 256 mebibytes

You have a tree on  $n$  vertices, edges are numbered by distinct integers from 1 to  $n - 1$ .

Let's call a circle from  $v$  with radius  $r$  a set of vertices in the connected component of  $v$  if you will leave only edges with numbers  $\leq r$ .

You need to answer several queries on the given tree.

In each query you are given  $k$  and  $k$  vertices  $v_1, v_2, \dots, v_k$ .

You need to find the number of ways to pick a radius for each given vertex, such that all circles won't intersect.

In other words, you need to calculate the number of tuples  $(r_1, r_2, \dots, r_k)$  ( $0 \leq r_1, r_2, \dots, r_k \leq n - 1$ ) such that  $circle(v_i, r_i) \cap circle(v_j, r_j) = \emptyset$  for  $i \neq j$ .

As the number may very big, you only need to find it modulo 998 244 353.

### Input

The first line of input contains one integer  $n$  ( $2 \leq n \leq 300\,000$ ): the number of vertices in the given tree.

Next  $(n - 1)$  lines contain the description of edges, each line contain two integers  $u_i, v_i$  ( $1 \leq u_i, v_i \leq n; u_i \neq v_i$ ) describing edge connecting vertices  $u_i$  and  $v_i$  with number  $i$  in the tree.

It is guaranteed that the given graph is a tree.

The next line of input contains one integer  $q$  ( $1 \leq q \leq n$ ): the number of queries.

Next  $q$  lines contain the description of edges, each line contain one integer  $k$  ( $1 \leq k \leq n$ ), and  $k$  **distinct** integers after,  $v_1, v_2, \dots, v_k$  ( $1 \leq v_i \leq n$ ): the current query.

It is guaranteed that the sum of  $k$  is at most 300 000.

### Output

For each query output one integer: the number of tuples  $(r_1, r_2, \dots, r_k)$  ( $0 \leq r_1, r_2, \dots, r_k \leq n - 1$ ) such that  $circle(v_i, r_i) \cap circle(v_j, r_j) = \emptyset$  for  $i \neq j$ , modulo 998 244 353.

### Example

standard input	standard output
3	2
1 2	4
2 3	
2	
3 1 2 3	
2 1 3	