

## Problem I. Tickets

Input file: *standard input*  
Output file: *standard output*  
Time limit: 3 seconds (5 seconds for Java)  
Memory limit: 512 mebibytes

There are  $n$  cities in Berland, which are enumerated from 1 to  $n$ . City number 1 is a capital of Berland. Cities are connected by  $n - 1$  trains,  $i$ -th of them connects city  $a_i$  with city  $b_i$ . Berland train system allows you to get from every city to any other, possibly, using more than one train.

There are  $m$  types of the tickets:  $i$ -th of them can be bought in city  $v_i$  for  $w_i$  berland dollars and allows to travel from  $v_i$  to any city  $x$  such that the distance from  $v_i$  to  $x$  is less or equal to  $k_i$ . The distance is measured in trains used during the travel.

Your task is to find minimal cost to get from some cities to capital.

### Input

In the first line you are given three integers  $n, m, q$  ( $1 \leq n \leq 10^5, 0 \leq m \leq 10^5, 1 \leq q \leq 10^5$ ) – number of cities in Berland, number of different type of tickets, number of queries correspondingly.

Each of next  $n - 1$  lines contain integers  $a_i$  and  $b_i$  ( $1 \leq a_i, b_i \leq n$ ) – cities connected by  $i$ -th train.

In the next  $m$  lines types of tickets are described:  $i^{th}$  contains three integers  $v_i$  ( $1 \leq v_i \leq n$ ) – city where one could buy and use it,  $k_i$  ( $1 \leq k_i \leq n - 1$ ) – maximum distance one could travel using this ticket,  $w_i$  ( $0 \leq w_i \leq 10^9$ ) – price of the ticket.

In the next  $q$  lines are described queries:  $i^{th}$  of them contains integer  $q_i$  ( $1 \leq q_i \leq n$ ) – city, from which you want to calculate cost to get to capital.

### Output

For every query output single line with integer – required cost to get from city to capital. If it's impossible to get to the capital using such tickets, print `Impossible` (without quotes).

### Examples

standard input	standard output
5 4 5	0
1 2	100
2 3	41
3 4	1
3 5	11
5 2 10	
3 1 40	
4 3 1	
2 1 100	
1	
2	
3	
4	
5	
2 0 2	0
1 2	Impossible
1	
2	

## Note

In the first sample, to get to the capital from the city 5, we need to perform the following actions:

- Buy a ticket with type 1 for 10 dollars and travel to the city 4.
- Buy a ticket with type 3 for 1 dollar and travel to the capital city 1.

Note that it's also possible to travel to the cities 3 and 2 using a ticket with type 1 (the distance between 5 and 3 is one train, while the distance between 5 and 2 is two trains, which is less or equal to 2), and get to the capital using tickets 2 or 4, but it would be a lot more expensive to travel to the capital this way.