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## COT2 - Count on a tree II

#tree ( /problems/tag/tree )

You are given a tree with **N** nodes. The tree nodes are numbered from **1** to **N**. Each node has an integer weight.

We will ask you to perform the following operation:

- **u v** : ask for how many different integers that represent the weight of nodes there are on the path from **u** to **v**.

### Input

In the first line there are two integers **N** and **M**. (**N** ≤ 40000, **M** ≤ 100000)

In the second line there are **N** integers. The *i*-th integer denotes the weight of the *i*-th node.

In the next **N-1** lines, each line contains two integers **u v**, which describes an edge (**u**, **v**).

In the next **M** lines, each line contains two integers **u v**, which means an operation asking for how many different integers that represent the weight of nodes there are on the path from **u** to **v**.

### Output

For each operation, print its result.

### Example

#### Input:

```
8 2
105 2 9 3 8 5 7 7
1 2
1 3
1 4
3 5
3 6
3 7
4 8
2 5
7 8
```

#### Output:

```
4
4
```

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shahayush457 (/users/shahayush457): 2020-05-05 23:25:29

The only part missing in the problem statement is the range of the weight which is  $1 \leq w \leq 2^{31} - 1$ .

Coordinate compression is needed.



zorov2 (/users/zorov2): 2020-04-22 09:19:35

Anybody solved this problem in Java? I tried implementing Mo's algo in Java but getting TLE, tried all kinds of optimizations.



prmondal (/users/prmondal): 2020-04-18 08:05:36

@hacker\_sk: You saved my life. Thanks. Admin should update the range of N.



bhavyarustgi10 (/users/bhavyarustgi10): 2020-04-14 15:55:05

Constraints are as it is given in the problem itself .

Expected Time Complexity is  $O(\max(N \log N, M * \sqrt{N}))$



hacker\_sk (/users/hacker\_sk): 2020-04-06 22:51:21

NOTE:  $N \leq 100000$  (not 40000, got seg fault and wa because of this) and weight  $\leq 2^{31} - 1$ .



sangmai (/users/sangmai): 2020-03-25 04:49:02

Thanks @bekh compression overcomes TLE



aryan12 (/users/aryan12): 2020-03-20 19:31:16

Input has multiple test cases. Read until end of file...



abhimanyu\_1998 (/users/abhimanyu\_1998): 2020-02-11 07:25:31

if using mos algo then use block size 500



zhangzhongyu (/users/zhangzhongyu): 2019-09-26 05:02:40

**Last edit: 2019-09-26 05:44:22**



bekh (/users/bekh): 2019-07-06 18:34:06

Range of the weight is big and using map will get timelimit. Use compression.

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Added by: Fotile (/users/fotile)  
Date: 2012-02-17  
Time limit: 1.207s  
Source limit: 50000B  
Memory limit: 1536MB  
Cluster: Cube (Intel G860) (/clusters/)  
Languages: All except: ASM64  
Resource: Just for fun...

Own tags

#mos-algorithm-on-tree#path-queries##

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