

F. Pairs of Paths

time limit per test: 6 seconds

memory limit per test: 512 megabytes

input: standard input

output: standard output

You are given a tree consisting of  $n$  vertices, and  $m$  simple vertex paths. Your task is to find how many pairs of those paths intersect at exactly one vertex. More formally you have to find the number of pairs  $(i, j)$  ( $1 \leq i < j \leq m$ ) such that  $path_i$  and  $path_j$  have exactly one vertex in common.

Input

First line contains a single integer  $n$  ( $1 \leq n \leq 3 \cdot 10^5$ ).

Next  $n - 1$  lines describe the tree. Each line contains two integers  $u$  and  $v$  ( $1 \leq u, v \leq n$ ) describing an edge between vertices  $u$  and  $v$ .

Next line contains a single integer  $m$  ( $1 \leq m \leq 3 \cdot 10^5$ ).

Next  $m$  lines describe paths. Each line describes a path by it's two endpoints  $u$  and  $v$  ( $1 \leq u, v \leq n$ ). The given path is all the vertices on the shortest path from  $u$  to  $v$  (including  $u$  and  $v$ ).

Output

Output a single integer — the number of pairs of paths that intersect at exactly one vertex.

Examples

inputCopy

5  
1 2  
1 3  
1 4  
3 5  
4  
2 3  
2 4  
3 4  
3 5

outputCopy

2

inputCopy

1  
3  
1 1  
1 1  
1 1

outputCopy

3

inputCopy

5  
1 2  
1 3  
1 4

Codeforces Round #703 (Div. 2)

Contest is running

00:19:26

Contestant

→ Submit?

Language: GNU G++14 6.4.0

Choose file: 파일 선택 선택된 파일 없음

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

Submit

→ Score table

	Score
<a href="#">Problem A</a>	270
<a href="#">Problem B</a>	540
<a href="#">Problem C1</a>	405
<a href="#">Problem C2</a>	405
<a href="#">Problem D</a>	945
<a href="#">Problem E</a>	1215
<a href="#">Problem F</a>	1620
Successful hack	100
Unsuccessful hack	-50
Unsuccessful submission	-50
Resubmission	-50

\* If you solve problem on 01:55 from the first attempt

```

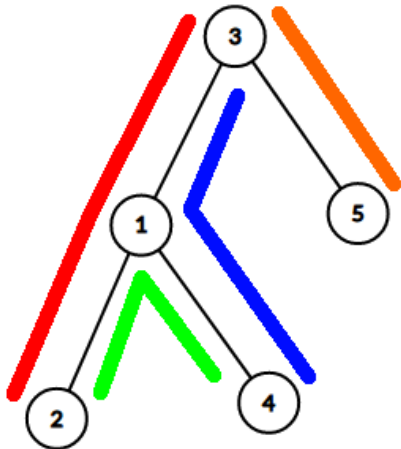
3 5
6
2 3
2 4
3 4
3 5
1 1
1 2

```

output

Copy

7

**Note**

The tree in the first example and paths look like this. Pairs (1, 4) and (3, 4) intersect at one vertex.

In the second example all three paths contain the same single vertex, so all pairs (1, 2), (1, 3) and (2, 3) intersect at one vertex.

The third example is the same as the first example with two additional paths. Pairs (1, 4), (1, 5), (2, 5), (3, 4), (3, 5), (3, 6) and (5, 6) intersect at one vertex.

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