

Contest Duration: 2025-04-12(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250412T2100&p1=248>) - 2025-04-12(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250412T2240&p1=248>) (local time) (100 minutes)

[Back to Home \(/home\)](#)

[Top \(/contests/abc401\)](#)

[Tasks \(/contests/abc401/tasks\)](#)

[Clarifications \(/contests/abc401/clarifications\)](#) [Results ▾](#)

[Standings \(/contests/abc401/standings\)](#)

[Virtual Standings \(/contests/abc401/standings/virtual\)](#) [Editorial \(/contests/abc401/editorial\)](#)

[Discuss \(<https://codeforces.com/blog/entry/141741>\)](#)



F - Add One Edge 3

[Editorial \(/contests/abc401/tasks/abc401_f/editorial\)](#)

Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 500 points

Problem Statement

You are given two trees: tree 1 with N_1 vertices numbered 1 to N_1 , and tree 2 with N_2 vertices numbered 1 to N_2 . The i -th edge of tree 1 connects vertices $u_{1,i}$ and $v_{1,i}$ bidirectionally, and the i -th edge of tree 2 connects vertices $u_{2,i}$ and $v_{2,i}$ bidirectionally.

One can add a bidirectional edge between vertex i of tree 1 and vertex j of tree 2 to obtain a single tree. Let $f(i, j)$ be the diameter of this tree.

Find $\sum_{i=1}^{N_1} \sum_{j=1}^{N_2} f(i, j)$.

Here, the distance between two vertices of a tree is the minimum number of edges that must be used to move between them, and the diameter of a tree is the maximum distance between two vertices.

Constraints

- $1 \leq N_1, N_2 \leq 2 \times 10^5$
- $1 \leq u_{1,i}, v_{1,i} \leq N_1$
- $1 \leq u_{2,i}, v_{2,i} \leq N_2$
- Both given graphs are trees.
- All input values are integers.

2026-01-02 (Fri)
05:22:22 +11:00

Input

The input is given from Standard Input in the following format:

```
N1
u1,1 v1,1
⋮
u1,N1-1 v1,N1-1
N2
u2,1 v2,1
⋮
u2,N2-1 v2,N2-1
```

Output

Print the answer.

Sample Input 1

[Copy](#)

```
3
1 3
1 2
3
1 2
3 1
```

[Copy](#)

Sample Output 1

[Copy](#)

```
39
```

[Copy](#)

For example, one can connect vertex 2 of tree 1 and vertex 3 of tree 2 to obtain a tree of diameter 5. Thus, $f(2, 3)$ is 5.

The sum of $f(i, j)$ is 39.

Sample Input 2

[Copy](#)

[Copy](#)

2026-01-02 (Fri)
05:22:22 +11:00

```
7  
5 6  
1 3  
5 7  
4 5  
1 6  
1 2  
5  
5 3  
2 4  
2 3  
5 1
```

Sample Output 2

[Copy](#)

```
267
```

[Copy](#)

```
/#telegram)
```

```
#url=https%3A%2F%2Fatcoder.jp%2Fcontests%2Fabc401%2Ftasks%2Fabc401_f%3Flang%3Den&title=F%20-
```

[Rule \(/contests/abc401/rules\)](#) [Glossary \(/contests/abc401/glossary\)](#)

[Terms of service \(/tos\)](#) [Privacy Policy \(/privacy\)](#) [Information Protection Policy \(/personal\)](#) [Company \(/company\)](#)
[FAQ \(/faq\)](#) [Contact \(/contact\)](#)

Copyright Since 2012 ©AtCoder Inc. (<http://atcoder.co.jp>) All rights reserved.