Shortcut edges

We say that an edge (x, y) in a directed simple graph G is a *shortcut edge* when there is a path in G from x to y which length is at least 2. Let the *cost* of a shortcut edge (x, y) be the length of the longest path from x to y in G.

The task

Given a directed acyclic graph G determine the sum of costs of all its shortcut edges.

Input

The first line of input contains a single positive integer N representing the number of vertices of the input graph G. We suppose that the vertices of G are labeled 0, 1, ..., $N - 1$. Next follow the lines containing the list of edges of G. Each line contains two integers a, b separated by space and representing the edge (a, b). The list is terminated by a line which does not represent an edge and which contains two zeroes separated by space. The edges in the list are not in any particular order. It holds that $|V(G)| = N \leq 10^4$, $|E(G)| \leq 8 \cdot 10^5$.

Output

The output contains one text line with an integer equal to the sum of costs of all shortcut edges in the input graph.

Example 1

Input

```
9
5 4
5 1
5 6
6 2
6 7
7 3
7 8
3 2
3 0
3 8
2 0
2 1
0 1
1 4
0 0
```

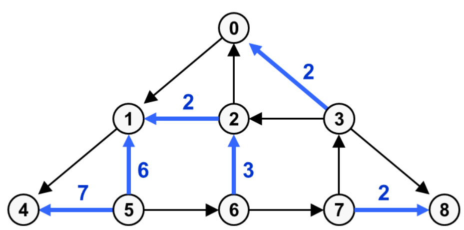

Image 1. The image depicts the graph in Example 1,
the shortcut edges are highlighted together with their costs.

Output

```
22
```

Example 2

Input

```
200
150 151
151 152
150 152
153 154
0 0
```

Output

```
2
```