Tree Tasks

Time limit: 1.0s **Memory limit:** 128M
Java 8: 1.4s

Given a weighted tree with N vertices and $N-1$ edges, your task is to find the diameter and radius of the tree.

We say the **diameter** of the tree is the **largest distance** between any two points.

We say the **radius** of a tree is the **minimum** of the **maximum** distances for **all points**.

Input Specification

First line, one integer N $(3 \leq N \leq 5 \times 10^5)$, denoting the number of vertices.

The next $N-1$ lines will have three integers u, v, w $(1 \leq u, v \leq N, 1 \leq w \leq 10^3, u \neq v)$, denoting that there is an edge between vertices u and v, with a weight of w.

Output Specification

On separate lines, output the diameter, and the radius of the tree in that order.

Sample Input

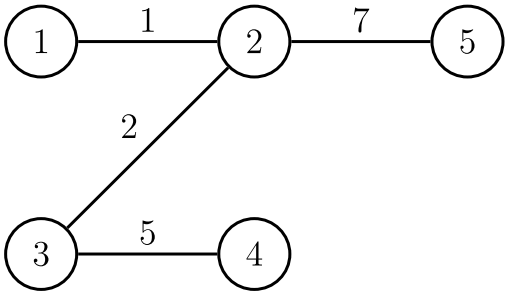
```
5
1 2 1
2 3 2
3 4 5
2 5 7
```

Sample Output

```
14
7
```

Sample Explanation

The graph is depicted below:



We can see that the distance between node 4 and 5 is the greatest distance, thus 14 is the diameter.

We can see that the minimum value between the maximum distances along the diameter are $\min(\max(7,7), \max(9,5), \max(14,0))$, thus 7 is the radius.