Statement

Once the suspicious accounts have been identified, you discover that the agents are organized as a sprawling network that seems to be hierarchically organized with Dolan at its head!

Each account, with the exception of Dolan, is placed under the supervision of a single supervisor. In order to better understand how this network works and to pretend yourself off as one of them, you will need to produce a group analysis based on these hierarchical links.

Level 1 agents are those placed directly under Dolan Grump. Level 2 agents are those whose superior is level 1, and so on.

You must identify how many agents belong to each level of the hierarchy.

Data

Input

Row 1: The number of agents in network **N**, between 1 and 1000

Rows 2 to **N** : Two integers **A** and **B** separated by as space, meaning that agent **B** is the superior of agent **A**.

Output

10 integers separated by spaces, representing the number of agents on each level between 1 and 10.

Notes :

- There is a maximum of 1000 agents in the network.

- No agent has a level of more than 10

- Each agent has exactly one superior, except for Dolan, who has no superior.

- Dolan Grump is represented by the integer 0.

Example

For the input :

```
5

1 4

3 1

4 0

2 4
```

The output should be :

```
1 1 2 1 0 0 0 0 0 0
```

The corresponding hierarchy is as follows: