Longest Task Path

Problem Description

You are given a project consisting of different number of tasks with different ID's. You have to find the number of tasks in the longest path.

A project consists of a set of tasks. Each task could be numbered as follows:

- Each task has an ID
- IDs of tasks are serial numbers starting from 1 (the number order having no relation to task ordering and IDs can be of random order or there might be missing IDs)
- A task having ID 'n' and having preceding tasks is named as n.{list of IDs of preceding tasks}; a task having no predecessors is named as n.{}
- Tasks may have the same predecessors
- No two tasks can have the same ID

Given the project task structure, the challenge is to identify the number of tasks in the longest path of tasks. Output "error" if IDs are not unique/invalid or there is a cycle of tasks.

Constraints

ID > 0

Input

Input consists of comma separated taskID.{task list} where taskID is the number of the task and task list is the list of predecessors of that ID. Each value in the task list is also comma separated. Any space characters surrounding the taskID or the task list need to be trimmed.

Output

Display the total number of tasks from the longest task path. Longest task path is obtained from the input data.

Time Limit (secs)

1

Examples

Example 1

Input

1.{}, 2.{}, 3.{1,2}

Output

2

Explanation:

From the input, we can see that tasks 1 and 2 have no predecessors but task 3 has a task list (task1, task2) as predecessor. The structure is:

$$\begin{tikzcd} 1 \arrow[r] & 3 \\ 2 \arrow[r] & 3 \end{tikzcd}$$

We can see that both the paths have same number of tasks so there are two longest paths i.e. 1->3 and 2->3. In this case answer is 2 because number of tasks in the longest task path is 2.

Example 2

Input

1.{}, 2.{1,4}, 3.{2}, 4.{3}

Output

error

Explanation:

The task structure formed from the above input is cyclic (1-->2-->3-->4-->2-->3-->4... and so on). So, error output is produced.

Task structure:

$$\begin{tikzcd} 1 \arrow[r] & 2 \arrow[r] & 3 \arrow[r] & 4 \arrow[ll, bend left] \end{tikzcd}$$