

## C. Party

time limit per test: 3 seconds  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

A company has  $n$  employees numbered from 1 to  $n$ . Each employee either has no immediate manager or exactly one immediate manager, who is another employee with a different number. An employee  $A$  is said to be the superior of another employee  $B$  if at least one of the following is true:

- Employee  $A$  is the immediate manager of employee  $B$
- Employee  $B$  has an immediate manager employee  $C$  such that employee  $A$  is the superior of employee  $C$ .

The company will not have a managerial cycle. That is, there will not exist an employee who is the superior of his/her own immediate manager.

Today the company is going to arrange a party. This involves dividing all  $n$  employees into several groups: every employee must belong to exactly one group. Furthermore, within any single group, there must not be two employees  $A$  and  $B$  such that  $A$  is the superior of  $B$ .

What is the minimum number of groups that must be formed?

### Input

The first line contains integer  $n$  ( $1 \leq n \leq 2000$ ) — the number of employees.

The next  $n$  lines contain the integers  $p_i$  ( $1 \leq p_i \leq n$  or  $p_i = -1$ ). Every  $p_i$  denotes the immediate manager for the  $i$ -th employee. If  $p_i$  is -1, that means that the  $i$ -th employee does not have an immediate manager.

It is guaranteed, that no employee will be the immediate manager of him/herself ( $p_i \neq i$ ). Also, there will be no managerial cycles.

### Output

Print a single integer denoting the minimum number of groups that will be formed in the party.

### Examples

input
5 -1 1 2 1 -1
output
3

### Note

For the first example, three groups are sufficient, for example:

- Employee 1
- Employees 2 and 4
- Employees 3 and 5