Police Investigation 2 (police2)

After managing to escape from the police in Terror Street, William is again hiding from them, this time in Crime Avenue. Crime Avenue is structured similarly to Terror Street, and consists of N houses numbered from 0 to $N-1$. William knows how the police works! They are searching for him going house by house: if William is not found in the i-th house, the people living there will be interrogated until they reveal to the officers that William may be hiding in house V_i. The police will then go there, and repeat the search.

Figure 1: Crime Avenue.

It's easy to prove that, no matter the hints of the inhabitants, the police will eventually reach an already visited house and therefore start looping! When the police notices that they are going in a loop, they stop and restart from a new, unvisited house. Eventually, the police will visit every house in the street.

William wants to know *how long is the longest loop* the police will stumble upon.

☞ Among the attachments of this task you may find a template file `police2.*` with a sample incomplete implementation.

Input

The first line contains the only integer N, the number of houses in the street. The second line contains N integers V_i, the number of the house the police will go to after visiting the house i.

Output

You need to write a single line with an integer: the number of houses in the longest loop.

Constraints

- $1 \leq N \leq 100\,000$.
- $0 \leq V_i < N$ for each $i = 0 \ldots N-1$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (10 points) $N \leq 10$.

– **Subtask 3** (25 points) There is only one loop.

– **Subtask 4** (25 points) Every house is part of a loop.

– **Subtask 5** (20 points) $N \leq 1000$.

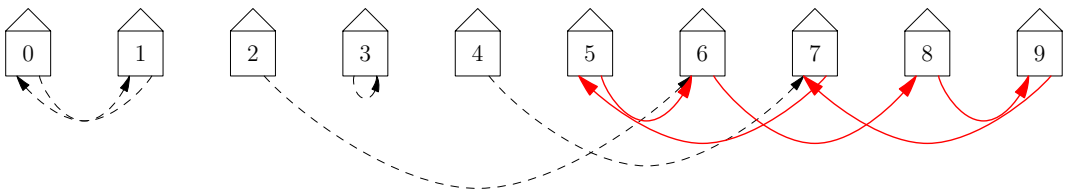
– **Subtask 6** (20 points) No additional limitations.

Examples

input	output
10 1 0 6 3 7 6 8 5 9 7	5
8 0 2 6 4 5 3 1 7	3

Explanation

In the **first sample case** the longest loop is 5 houses long: 5, 6, 8, 9, 7.



In the **second sample case** there are two loops 3 houses long: 1, 2, 6 and 3, 4, 5.