

Spin the Wheel

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 512 megabytes

There is a spinning wheel consisting of inner and outer wheels, both divided into n equal pieces. Pieces of the inner correspond to distinct pieces of the outer wheel. You may spin the inner wheel, but the outer wheel must stay fixed. The n pieces of the outer wheel have numbers $0, 1, \dots, n - 1$ written clockwise on it, respectively, while all n pieces of the inner wheel initially has numbers all zero written. We then refer to the outer wheel piece with number i ($0 \leq i \leq n - 1$) on it as the i -th piece of the outer wheel.

You can perform two kinds of operations:

1. Spin the (inner) wheel. After the spin, all pieces of the inner wheel must still correspond to distinct pieces of the outer wheel.
2. For every piece on the inner wheel, add the number on the corresponding piece of the outer wheel to the number on it . If the result is greater than or equal to n , subtract n from it.

Given n and $a_0, a_1, \dots, a_{n-1}$, find the minimum number of operations needed to make the number on the piece of the inner wheel that corresponds to the i -th piece of the outer wheel equals to a_i , or determine that this is impossible.

Input

The first line contains an integer n ($3 \leq n \leq 10^5$), denoting the number of pieces on both inner and outer wheels.

The next line contains n integers $a_0, a_1, \dots, a_{n-1}$ ($0 \leq a_i < n$), denoting the target number for the piece on the inner wheel that corresponds to the i -th piece of the outer wheel.

Output

Output a number in a line, denoting the minimum number of operations required to make the number on the piece of the inner wheel that corresponds to the i -th piece of the outer wheel equals to a_i . If it is impossible to do so, output -1 in a line instead.

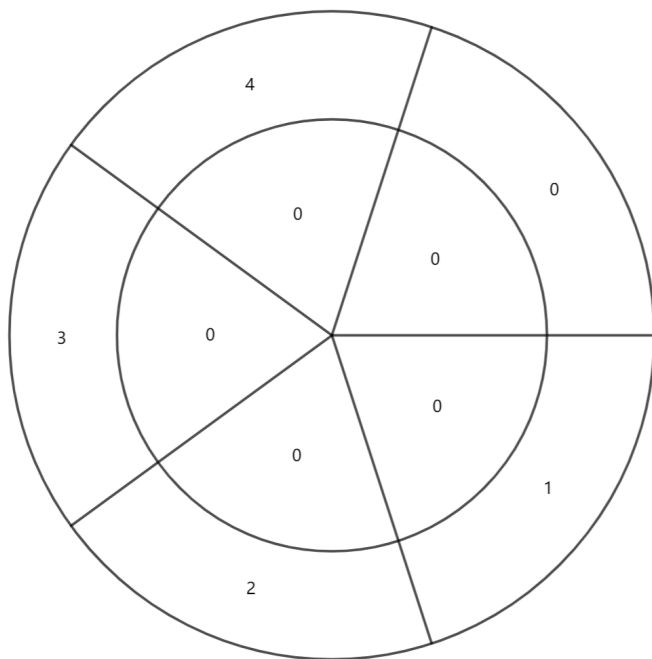
Example

standard input	standard output
5 1 3 0 2 4	3

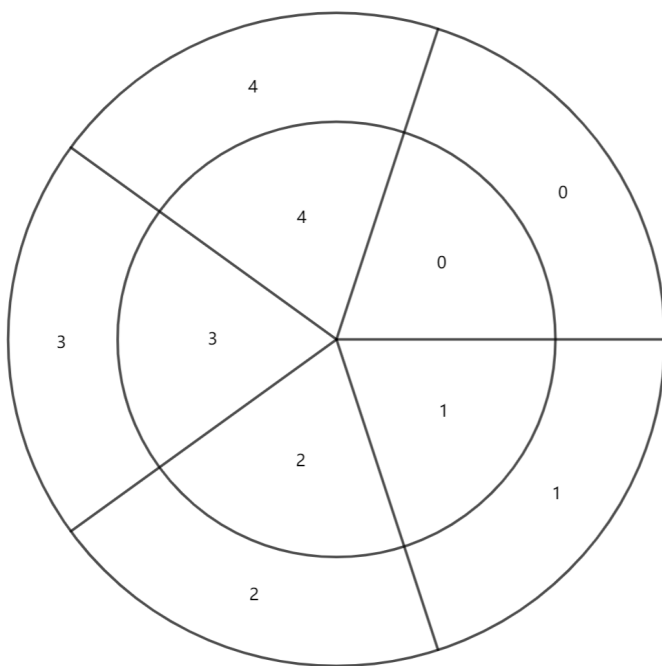
Note

A set of possible operations corresponding to the first example is shown below.

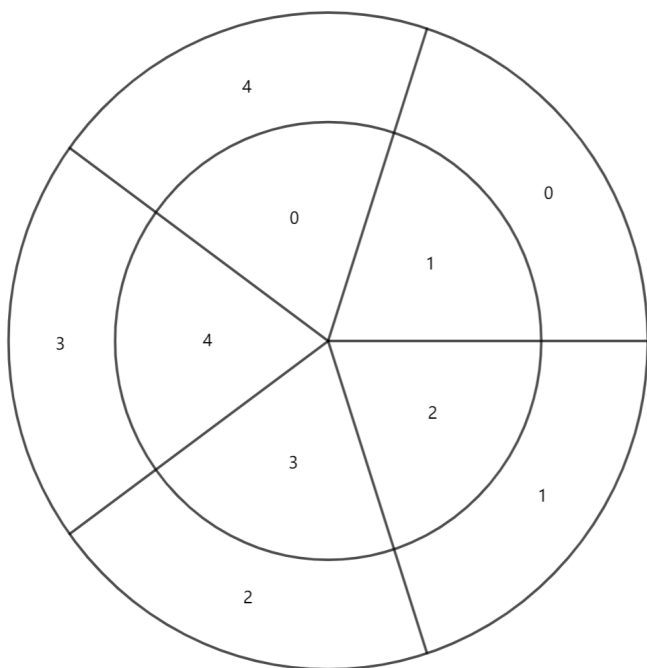
Before the first step, a picture of the spinning wheel is shown below:



The first operation we do is type two. After the first step, a picture of the spinning wheel is shown below:



The second operation we do is type one. We choose to spin it for 288° clockwise. After the second step, a picture of the spinning wheel is shown below:



The third operation we do is type two. After the third step, a picture of the spinning wheel is shown below:

