Long Permutation

HackerRank

Consider an inifite array, a, of positive numbers, $a_1, a_2, \ldots$, where each $a_i = i$. You can apply a permutation, p, of size n (i.e., n different numbers $1 \le p_1, \ldots, p_n \le n$) to the n-element subset of your array from a_1 through a_n in the following way:

$$(a_1, \ldots, a_n) \to (a_{p_1}, \ldots, a_{p_n}).$$

To get infinite array b, you must apply permutation p to the first n elements (a_1 to a_n), then to elements a_2 through a_{n+1}, then to elements a_3 through a_{n+2}, and so on, infinitely many times.

Given the values of n, m, and p, find and print the value of b_m. See the *Explanation* section below for more detail.

Note: This challenge uses 1-based array indexing.

Input Format

The first line contains 2 space-separated integers, n and m, respectively.
The second line contains n space-separated integers describing the respective values of $p_1, p_2, \ldots, p_n$.

Constraints

- $1 \le n \le 10^5$
- $1 \le m \le 10^{18}$
- $1 \le p_1, p_2, \ldots, p_n \le n$, and each p_i is unique.

Output Format

Print a single integer denoting the value of b_m.

Sample Input 0

```
2 10
2 1
```

Sample Output 0

```
11
```

Sample Input 1

```
3 1
2 3 1
```

Sample Output 1

```
2
```

Sample Input 2

```
3 10
2 3 1
```

Sample Output 2

```
10
```

Explanation

Sample Case 0 has the following sequence of array transformations:

$\mathbf{1}\ \mathbf{2}\ 3\ 4\ 5\ 6\ 7\ 8\ 9\ 10\ 11\ 12 \ldots$

$2\ \mathbf{1}\ \mathbf{3}\ 4\ 5\ 6\ 7\ 8\ 9\ 10\ 11\ 12 \ldots$

$2\ 3\ \mathbf{1}\ \mathbf{4}\ 5\ 6\ 7\ 8\ 9\ 10\ 11\ 12 \ldots$

$2\ 3\ 4\ \mathbf{1}\ \mathbf{5}\ 6\ 7\ 8\ 9\ 10\ 11\ 12 \ldots$

$2\ 3\ 4\ 5\ \mathbf{1}\ \mathbf{6}\ 7\ 8\ 9\ 10\ 11\ 12 \ldots$

$2\ 3\ 4\ 5\ 6\ \mathbf{1}\ \mathbf{7}\ 8\ 9\ 10\ 11\ 12 \ldots$

$2\ 3\ 4\ 5\ 6\ 7\ \mathbf{1}\ \mathbf{8}\ 9\ 10\ 11\ 12 \ldots$

$2\ 3\ 4\ 5\ 6\ 7\ 8\ \mathbf{1}\ \mathbf{9}\ 10\ 11\ 12 \ldots$

$2\ 3\ 4\ 5\ 6\ 7\ 8\ 9\ \mathbf{1}\ \mathbf{10}\ 11\ 12 \ldots$

$2\ 3\ 4\ 5\ 6\ 7\ 8\ 9\ 10\ \mathbf{1}\ \mathbf{11}\ 12 \ldots$

$2\ 3\ 4\ 5\ 6\ 7\ 8\ 9\ 10\ 11\ \mathbf{1}\ \mathbf{12}\ \ldots$

As you can see, each $b_i = a_i + 1 = i + 1$. Thus, we know that $b_m = m + 1 = 10 + 1 = 11$.

Sample Case 1 and *Sample Case 2* have the following sequence of array transformations:

$\mathbf{1}\ \mathbf{2}\ \mathbf{3}\ 4\ 5\ 6\ 7\ 8\ 9\ 10\ 11\ 12\ 13 \ldots$

$2\ \mathbf{3}\ \mathbf{1}\ \mathbf{4}\ 5\ 6\ 7\ 8\ 9\ 10\ 11\ 12\ 13 \ldots$

$2\ 1\ \mathbf{4}\ \mathbf{3}\ \mathbf{5}\ 6\ 7\ 8\ 9\ 10\ 11\ 12\ 13 \ldots$

$2\ 1\ 3\ \mathbf{5}\ \mathbf{4}\ \mathbf{6}\ 7\ 8\ 9\ 10\ 11\ 12\ 13 \ldots$

$2\ 1\ 3\ 4\ \mathbf{6}\ \mathbf{5}\ \mathbf{7}\ 8\ 9\ 10\ 11\ 12\ 13 \ldots$

$2\ 1\ 3\ 4\ 5\ \mathbf{7}\ \mathbf{6}\ \mathbf{8}\ 9\ 10\ 11\ 12\ 13 \ldots$

$2\ 1\ 3\ 4\ 5\ 6\ \mathbf{8}\ \mathbf{7}\ \mathbf{9}\ 10\ 11\ 12\ 13 \ldots$

$2\ 1\ 3\ 4\ 5\ 6\ 7\ \mathbf{9}\ \mathbf{8}\ \mathbf{10}\ 11\ 12\ 13 \ldots$

$2\ 1\ 3\ 4\ 5\ 6\ 7\ 8\ \mathbf{10}\ \mathbf{9}\ \mathbf{11}\ 12\ 13 \ldots$

$2\ 1\ 3\ 4\ 5\ 6\ 7\ 8\ 9\ \mathbf{11}\ \mathbf{10}\ \mathbf{12}\ 13 \ldots$

$2\ 1\ 3\ 4\ 5\ 6\ 7\ 8\ 9\ 10\ \mathbf{12}\ \mathbf{11}\ \mathbf{13}\ \ldots$

As you can see, $b_1 = 2$ and $b_{10} = 10$.