

P. Valeriy and Deque

time limit per test: 6 seconds
memory limit per test: 256 megabytes

Recently, on the course of algorithms and data structures, Valeriy learned how to use a deque. He built a deque filled with n elements. The i -th element is a_i ($i = 1, 2, \dots, n$). He gradually takes the first two leftmost elements from the deque (let's call them A and B , respectively), and then does the following: if $A > B$, he writes A to the beginning and writes B to the end of the deque, otherwise, he writes to the beginning B , and A writes to the end of the deque. We call this sequence of actions an operation.

For example, if deque was $[2, 3, 4, 5, 1]$, on the operation he will write $B = 3$ to the beginning and $A = 2$ to the end, so he will get $[3, 4, 5, 1, 2]$.

The teacher of the course, seeing Valeriy, who was passionate about his work, approached him and gave him q queries. Each query consists of the singular number m_j ($j = 1, 2, \dots, q$). It is required for each query to answer which two elements he will pull out on the m_j -th operation.

Note that **the queries are independent** and for each query the numbers A and B should be **printed in the order in which they will be pulled out of the deque**.

Deque is a data structure representing a list of elements where insertion of new elements or deletion of existing elements can be made from both sides.

Input

The first line contains two integers n and q ($2 \leq n \leq 10^5$, $0 \leq q \leq 3 \cdot 10^5$) — the number of elements in the deque and the number of queries. The second line contains n integers a_1, a_2, \dots, a_n , where a_i ($0 \leq a_i \leq 10^9$) — the deque element in i -th position. The next q lines contain one number each, meaning m_j ($1 \leq m_j \leq 10^{18}$).

Output

For each teacher's query, output two numbers A and B — the numbers that Valeriy pulls out of the deque for the m_j -th operation.

Examples

input	Copy
5 3 1 2 3 4 5 1 2 10	
output	Copy
1 2 2 3 5 2	

input	Copy
2 0 0 0	
output	Copy

Note

- Consider all 10 steps for the first test in detail:
- $[1, 2, 3, 4, 5]$ — on the first operation, A and B are 1 and 2, respectively.
So, 2 we write to the beginning of the deque, and 1 — to the end.

We get the following status of the deque: $[2, 3, 4, 5, 1]$.
 - $[2, 3, 4, 5, 1] \Rightarrow A = 2, B = 3$.
 - $[3, 4, 5, 1, 2]$
 - $[4, 5, 1, 2, 3]$
 - $[5, 1, 2, 3, 4]$
 - $[5, 2, 3, 4, 1]$
 - $[5, 3, 4, 1, 2]$
 - $[5, 4, 1, 2, 3]$
 - $[5, 1, 2, 3, 4]$
 - $[5, 2, 3, 4, 1] \Rightarrow A = 5, B = 2$.

ICPC Assiut University Training - Juniors Phase 1 Sheets-2022

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→ Group Contests

- Juniors Phase 1 Practice #5 (Bitmask, Bitset, Bits)
- Juniors Phase 1 Practice #4 (Binary search , Two pointers)
- Juniors Phase 1 Practice #3 (STL 2)
- Juniors Phase 1 Practice #2 (STL 1)
- Juniors Phase 1 Practice #1 (Prefix sum , Frequency Array)

Juniors Phase 1 Practice #2 (STL 1).

Finished

Practice

→ About Time Scaling

This contest uses time limits scaling policy (depending on a programming language). The system automatically adjusts time limits by the following multipliers for some languages. Despite scaling (adjustment), the time limit cannot be more than 30 seconds. Read the details by the [link](#).

→ Virtual participation

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Start virtual contest

→ Submit?

Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
310220203	Mar/12/2025 10:43	Accepted
310220082	Mar/12/2025 10:42	Wrong answer on test 1
310182973	Mar/12/2025 03:10	Wrong answer on test 4