Book stack

When someone returns a borrowed book into the library, the librarian just throws it on the top of a large stack.

From time to time, she picks up the topmost book from the stack and carries it over to the shelf where it belongs.

Finally, she has a robotic arm to help her. The arm is able to grab the top K books in the stack (or the entire stack if there are less than K books in it) and flip it upside down.

Simulate this process.

Input

The input contains up to 1 000 000 lines.

The first line contains the integer K ($1 \leq K \leq 1\,000\,000$).

Each of the following lines contains a single integer representing an action.

- Each positive integer represents a book to be put onto the stack. (At some moments the book stack may contain multiple copies of the same book.)
- The number -1 means that the topmost book is removed.
- The number -2 means that the robotic arm is used.
- The number 0 terminates the input.

No book number will exceed 10^9. You will never be requested to remove a book from an empty stack.

Warning: The inputs are rather large. A good solution using `C++::iostream` or `Python::input()` should still pass, but we suggest to use standard I/O in C++ or `sys.stdin.readlines()` in Python.

Output

For each -1 in the input, output a single line with the number of the book that was removed in that step.

Example

input

```
3
12345
23456
34567
45678
-2
-1
98765
-2
-1
-1
-2
-1
0
```

output

```
23456
45678
34567
12345
```