Concert Ticket

Time: 1 sec / Memory: 256 MB

Problem Statement

There are n concert tickets available, each with a certain price. Then, m customers arrive, one after another.
Each customer announces the maximum price they are willing to pay for a ticket, and after this, they will get a ticket with the nearest possible price such that it does not exceed the maximum price.

Input

The first input line contains integers n and m, the number of tickets and the number of customers. ($1 \leq n, m \leq 2 \times 10^5$)
The next line contains n integers $h_1, h_2, \ldots, h_n$, the price of each ticket. ($1 \leq h_i \leq 10^9$)
The last line contains m integers $t_1, t_2, \ldots, t_m$, the maximum price for each customer in the order they arrive. ($1 \leq t_i \leq 10^9$)

Output

Print, for each customer, the price that they will pay for their ticket. After this, the ticket cannot be purchased again. If a customer cannot get any ticket, print -1.

Example

Input:

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5 3
5 3 7 8 5
4 8 3
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Output:

3
8
-1