

Binary Search Near Repeat

Time limit: 1 sec

Given a sorted array of **N** elements of possibly non-distinct positive integers, our task is to process **M** queries. Each query is a number **X_i** and we have to find the largest index of the member of A not exceeding **X_i** .

The index of the array starts at 0.

Input

- The first line of input contains two integers **N** and **M** ($1 \leq N, M \leq 100\,000$) that give the number of element in the array and the number of queries.
- The second line contains **N** positive integer not more than 1,000,000 in non-decreasing order representing the elements in the array.
- The third line contains **M** integers representing the queries.

Output

There must be exactly **M** lines. Each line must contain the answer of each query where it is either the largest element of the array not exceeding **X_i** or a value of -1 indicating that no such element can be found.

Remark

For this problem, you shall not use the standard library of the languages that provides binary search, hashing or sorting, either directly or indirectly.

Example

Input	Output
10 8	-1
10 13 14 14 14 15 16 16 18 200	0
9 10 11 14 0 200 20 16	0
	4
	-1
	9
	8
	7