

Problem A – Automated Vehicle Search.

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ITSURIN has invented a rails system which resembles a scale train, this allows him to store without any problem his priceless collection of $1/64$ scale vehicles.

Even when the vehicles are at scale he has a lot of them, so the rails system takes a lot of space of ITSURIN house, this is why he usually takes a lot of time to find a vehicle. As the good engineer he is, ITSURIN decided to implement a mechanism using arduino, sensors, servomotors, and an integrated interface where he can input the ID of the vehicle he is looking for and then the system will find and retrieve such vehicle if it exists.

ITSURIN always stores the vehicles in the system by increasing order of ID, so he decided to use a pretty clever search algorithm to find the vehicles, his algorithm is as follows:

1. Let $S = \text{int}(\text{sqrt}(N))$ where N is the number of vehicles in ITSURIN's collection, and $\text{int}(X)$ is a function that returns the integer part of the real number X .
2. Let K be the input ID the mechanism will search for.
3. Put the ID scanner in position 0 just before the first vehicle.
4. While the ID read by the scanner is less than K and the scanner position is less than N , move S steps forward.
5. If the ID read by the scanner equals K . Retrieve the vehicle and stop.
6. Move S steps backwards.
7. While the ID read by the scanner is less than K , move 1 step forward.
8. If the ID read by the scanner equals K . Retrieve the vehicle and stop.

ITSURIN has been running some experiments with his algorithm, and he believes it takes a lot of steps to find a given ID. He wants your help to calculate how many times the scanner will move before the mechanism stops.

Input

The first line of input contains two integer numbers separated by a space N ($1 \leq N \leq 10^6$) and Q ($1 \leq Q \leq 10^5$), representing the number of cars in ITSURIN's collection and the number of IDs ITSURIN will query. Each of the next N lines contains an integer number a_i ($1 \leq a_i \leq 10^9$ and $a_i < a_{i+1}$ for all i) representing the ID of the i -th positioned vehicle in ITSURIN's collection. Each of the following Q lines contains an integer number K_i ($1 \leq K_i \leq 10^9$), representing the ID of ITSURIN's i -th query.

Output

For each query in the input print a line with an integer number representing the number of times the scanner will move before the mechanism stops, if the mechanism will not stop with ITSURIN's algorithm print -1 for that query.

Sample input 1	Sample output 1
6 6	5
100	1
105	3
109	3
205	-1
300	2
700	
300	
105	
100	
700	
500	
205	