Problem D. Skyscrapers

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	256 mebibytes

At the main street of the city Yecho there are N skyscrapers, standing sequentially one next to other. If look leftside right, sequence of their height is $a_1, a_2, \ldots, a_N$.

Once Ugurbato, the sea monster, invaded this city. When Ugurbato hits the skyscraper, it is destroyed; moreover, Ugurbato is so strong that he creates a blast wave which is going to the left and to the right side from the skyscraper hit by monster.

Consider the left part of the blast wave. Let's say the skyscraper i was hit by Ugurbato. If blast wave meets already destroyed skyscraper, it decays. If blast wave meets non-destroyed skyscraper with number k, it is destroyed if and only if $a_i - a_k \geq |i-k|$ and blast wave does not decay at this skyscraper regardless of its destruction. For the right part of the blast wave process is similar.

Ugurbato hits M times, and each next hit is done when both blast waves decay.

Print the number of skyscrapers which are destroyed after each Ugurbato's hit.

Input

First line of the input contains one integer N ($1 \leq N \leq 10^5$) — number of the skyscrapers.

Second line contains N space-separated integers $a_1, a_2, ..., a_N$ — heights of the skyscrapes, listed leftside right ($1 \leq a_i \leq 10^9$).

Third line contains one integer M ($1 \leq M \leq N$) — number of Ugurbato's hits.

Fourth line contains M space-separated pairwise distinct integers $b_1, b_2, ..., b_M$ — nunmbers of the skyscrapers, which were hit by Ugurbato, in order (skyscrapers are numbered from left to right, starting from one). It is guaranteed that for any i skyscraper b_i was not destroyed by the blast wave before it was destroyed directly by Ugurbato's hit.

Output

Print M lines, each containing one integer — number of skyscrapers, destroyed after i'th hit of the monster.

Examples

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