

# Next and Prev

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            15 seconds  
Memory limit:         1024 megabytes

Let  $p_1, \dots, p_n$  be a permutation of  $[1, \dots, n]$ .

Let the  $q$ -subsequence of  $p$  be a permutation of  $[1, q]$ , whose elements are in the same relative order as in  $p_1, \dots, p_n$ . That is, we extract all elements not exceeding  $q$  together from  $p$  in the original order, and they make the  $q$ -subsequence of  $p$ .

For a given array  $a$ , let  $pre(i)$  be the largest value satisfying  $pre(i) < i$  and  $a_{pre(i)} > a_i$ . If it does not exist, let  $pre(i) = -10^{100}$ . Let  $next(i)$  be the smallest value satisfying  $next(i) > i$  and  $a_{next(i)} > a_i$ . If it does not exist, let  $next(i) = 10^{100}$ .

For each  $q$  such that  $1 \leq q \leq n$ , let  $a_1, \dots, a_q$  be the  $q$ -subsequence of  $p$ . For each  $i$  such that  $1 \leq i \leq q$ ,  $pre(i)$  and  $next(i)$  will be calculated as defined. Then, you will be given some integer values of  $x$ , and for each of them you have to calculate  $\sum_{i=1}^q \min(next(i) - pre(i), x)$ .

## Input

Each test contains multiple test cases. The first line contains the number of test cases  $t$  ( $1 \leq t \leq 10^4$ ). The description of the test cases follows.

The first line of each test case contains a single integer  $n$  ( $1 \leq n \leq 3 \cdot 10^5$ ) — the length of the permutation.

The second line of each test case contains  $n$  integers  $p_1, \dots, p_n$  ( $1 \leq p_i \leq n$ ) — the initial permutation.

Then, for each  $q$  such that  $1 \leq q \leq n$  in ascending order, you will be given an integer  $k$  ( $0 \leq k \leq 10^5$ ), representing the number of queries for the  $q$ -subsequence. Then  $k$  numbers in a line follow: each of them is the value of  $x$  for a single query ( $1 \leq x \leq q$ ).

It is guaranteed that the sum of  $n$  over all test cases does not exceed  $3 \cdot 10^5$  and the sum of  $k$  over all test cases does not exceed  $10^5$ .

## Output

For each test case, for each query, print a single line with an integer: the answer to the query.

## Example

standard input	standard output
1	1
7	9
6 1 4 3 2 5 7	8
1 1	5
0	10
1 3	14
1 2	16
3 1 2 3	14
1 3	30
2 2 6	

## Note

The 1-subsequence is  $[1]$ , and  $pre = [-10^{100}]$ ,  $next = [10^{100}]$ .  $ans(1) = \min(10^{100} - (-10^{100}), 1) = 1$ .

The 5-subsequence is  $[1, 4, 3, 2, 5]$ , and  $pre = [-10^{100}, -10^{100}, 2, 3, -10^{100}]$ ,  $next = [2, 5, 5, 5, 10^{100}]$ .  $ans(1) = 5$ ,  $ans(2) = 10$ ,  $ans(3) = 14$ .