
Easy DP Problem

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 512 megabytes

lqybxz is weak in dynamic programming. One day, his roommate gives him a sequence b_1, b_2, \dots, b_m and he asks lqybxz to do a dynamic programming. There are $(m + 1)^2$ states $dp[i][j]$ where $0 \leq i, j \leq m$, and the transition equation is:

$$dp[i][j] = \begin{cases} 0 & (i = 0) \\ i^2 + dp[i - 1][j] & (i > 0, j = 0) \\ i^2 + \max(dp[i - 1][j], dp[i - 1][j - 1] + b[i]) & (i > 0, j > 0) \end{cases}$$

lqybxz can't solve this easy DP problem, so he turns to you for help. You are given a sequence a_1, a_2, \dots, a_n and q queries. In the i -th query, you are given three integers l_i, r_i and k_i . Please write a program to figure out the value of $dp[m_i][k_i]$ when lqybxz's roommate chooses $a_{l_i}, a_{l_i+1}, \dots, a_{r_i}$ as the initial sequence b . Here, $m_i = r_i - l_i + 1$ and $b_j = a_{l_i+j-1}$ for every j satisfying $1 \leq j \leq m_i$.

Input

The input contains multiple cases. The first line of the input contains a single integer T ($1 \leq T \leq 100$), the number of cases.

For each case, the first line of the input contains a single integer n ($1 \leq n \leq 10^5$), the length of the sequence. The second line contains n integers a_1, a_2, \dots, a_n ($1 \leq i \leq n, 1 \leq a_i \leq 10^6$). The third line contains a single integer q ($1 \leq q \leq 10^5$), the number of queries. Each of the next q lines contains three integers l_i, r_i and k_i ($1 \leq i \leq q, 1 \leq l_i \leq r_i \leq n, 1 \leq k_i \leq r_i - l_i + 1$), denoting a query.

It is guaranteed that the sum of all n over all cases does not exceed 5×10^5 , and the sum of q over all cases does not exceed 5×10^5 .

Output

For each case, print q lines, where the i -th ($1 \leq i \leq q$) line contains a single integer, the value of $dp[m_i][k_i]$.

Example

standard input	standard output
1	19
5	70
1 2 3 4 5	4
3	
1 3 2	
1 5 5	
3 3 1	