Problem C
Alien Racer

Time limit: 3 seconds

Memory limit: 2048 megabytes

Problem Description

You have a race track that is n meters long. The height of the track at each meter is given by $a_1, a_2, a_3, ..., a_n$. It starts from a height of 0 meters.

Imagine an alien runner weighing w kilograms, with a stride length of l meters. For the k-th step, he covers a distance from $s_k = (k-1) \times l_j$ meters to $e_k = \min(n, k \times l_j)$ meters. During the k-th step, he spends energy to overcome the highest point within that range and then move forward by $(e_k - s_k)$ meters, which in total costs $\left(\max_{s_k \le x \le e_k} a_x - a_{s_k}\right) \times w + (e_k - s_k) \times w$ units of energy. The runner stops when he reaches the end of the track at n meters.

Now, there are q alien runners. Each one has a weight w_j kilograms and a stride length l_j meters. As the organizer, you need to calculate how much energy each runner needs to complete the race.

Input Format

The first line contains two positive integers, n and q, representing the length of the race track and the number of alien race participants. Following that are n integers, representing the heights at each meter of the track. Then, there are q lines, where the j-th line contains two positive integers, w_j and l_j, representing the weight and stride length of each race participant, respectively.

Output Format

For each race participant, output a positive integer representing the energy required to complete the race.

Technical Specification

- $1 \le n, q \le 5 \times 10^5$
- $-10^5 \le a_i \le 10^5$ for $i \in [1, n]$
- $1 \le w_j \le 10^5$ for $j \in [1, q]$
- $1 \le l_j \le n$ for $j \in [1, q]$

Sample Input 1

```
5 3
-30 12 60 -43 -10
7 2
10 1
```

```
3 4
```

Sample Output 1

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686
1280
294
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Note

The following picture shows the first query of the sample testcase with $w = 7, l = 2$. In total, it will take 3 steps, needing a total of $98 + 350 + 238 = 686$ units of energy.