Problem E
Parallel Sums
Time limit: 3 seconds

You are given two integers n and m. For a sequence of n integers $A = (a_1, a_2, \ldots, a_n)$, the *parallel sums* of A are the $n - m + 1$ integers $s_1, s_2, \ldots, s_{n-m+1}$ defined by $s_i = a_i + a_{i+1} + \ldots + a_{i+m-1}$ for each i ($1 \le i \le n - m + 1$).

You are given the values of $s_1, s_2, \ldots, s_{n-m+1}$. Your task is to answer q queries, described as follows. In the j-th query, you are given two integers l_j and r_j, and you are asked to find the smallest possible value of $\max(a_{l_j}, a_{l_j+1}, \ldots, a_{r_j})$ among all sequences $A = (a_1, a_2, \ldots, a_n)$ of n integers (possibly negative) such that $s_1, s_2, \ldots, s_{n-m+1}$ are the parallel sums of A. Or determine if this value can be arbitrarily small.

Input

The first line of input contains two integers n and m ($1 \le m \le n \le 200\,000$).

The second line contains $n - m + 1$ integers $s_1, s_2, \ldots, s_{n-m+1}$ ($-10^9 \le s_i \le 10^9$).

The third line contains a single integer q ($1 \le q \le 100\,000$).

The j-th of the next q lines contains two integers l_j and r_j ($1 \le l_j \le r_j \le n$).

Output

Output q lines. The j-th line should contain the smallest possible value of $\max(a_{l_j}, a_{l_j+1}, \ldots, a_{r_j})$. If that value can be arbitrarily small, output `unbounded` instead.

Sample Input #1	Sample Output #1
8 4 4 -4 2 6 5 4 3 7 4 6 1 8 2 5	2 unbounded 4 -1

Explanation for the sample input/output #1

For the first query, take $A = (9, -4, -3, 2, 1, 2, 1, 1)$. The parallel sums of A are $(4, -4, 2, 6, 5)$ as required. Then $\max(a_3, \ldots, a_7) = \max(-3, 2, 1, 2, 1) = 2$. It can be shown that 2 is the smallest possible value.

For the second query, you can make the value arbitrarily small.

For the third query, take $A = (4, -3, 0, 3, -4, 3, 4, 2)$. Then $\max(4, -3, 0, 3, -4, 3, 4, 2) = 4$, which is the smallest possible value.



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