D - 連続する部分列とクエリ / Contiguous Subsequences and Queries

Time limit : 4sec / Memory limit : 1024MB

Score : 100 points

Problem Statement

You are given a sequence of integers of length N, $\{a_i\}$. You are also given Q queries.

In the j-th query, two integers L_j and R_j are given. Find the maximum possible absolute value of the sum of the elements in a contiguous subsequence (possibly empty) included between the L_j-th and R_j-th elements of $\{a_i\}$ (inclusive).

Constraints

- $1 \leq N \leq 200\,000$
- $1 \leq Q \leq 200\,000$
- $-10^9 \leq a_i \leq 10^9$
- $1 \leq L_j \leq R_j \leq N$
- All values in input are integers.

Partial Score

50 points will be awarded for passing the test cases satisfying $N \leq 3000$ and $Q \leq 3000$.

Input

Input is given from Standard Input in the following format:

$$
\begin{array}{l}
N \ \ Q \\
a_1 \ \ \ldots \ \ a_N \\
L_1 \ \ R_1 \\
\vdots \\
L_Q \ \ R_Q
\end{array}
$$

Output

Print Q lines. The j-th line should contain the response to the j-th query.

Sample Input 1

```
5 4
8 -5 -2 10 -10
1 2
2 3
2 5
2 2
```

Sample Output 1

```
8
7
10
5
```

- In the first query, choosing the contiguous subsequence $\{8\}$ from $\{8, -5\}$ results in the maximum absolute value of the sum, 8.
- In the second query, choosing the contiguous subsequence $\{-5, -2\}$ from $\{-5, -2\}$ results in the maximum absolute value of the sum, 7.
- In the third query, choosing the contiguous subsequence $\{-10\}$ from $\{-5, -2, 10, -10\}$ results in the maximum absolute value of the sum, 10.
- In the fourth query, choosing the contiguous subsequence $\{-5\}$ from $\{-5\}$ results in the maximum absolute value of the sum, 5.

Sample Input 2

```
10 10
-54 97 62 37 -15 13 73 36 -1 -28
2 9
4 5
5 10
5 10
2 6
1 2
2 4
4 8
3 5
2 9
```

Sample Output 2

```
303
37
122
122
196
97
196
144
99
303
```

Submit