Problem D. Non-Decreasing Subarray Game

Input file:	*standard input*
Output file:	*standard output*
Time limit:	3 seconds
Memory limit:	256 mebibytes

Yuto and Platina are going to play a Non-Decreasing Subarray Game. The game is played on an array A of length N.

Yuto first says an integer, and after that, Platina says an integer. The numbers selected by the players should be in the interval from L to R, inclusive. Let the two selected integers be a and b, ordered in such a way that $a \le b$. Then the score obtained in the game is the number of pairs (i, j) such that $a \le i \le j \le b$ and the interval $[i, j]$ forms a non-decreasing subarray in array A.

We say that $[i, j]$ forms a non-decreasing subarray when, for each x and y such that $i \le x \le y \le j$, it is true that $A[x] \le A[y]$.

Yuto wants the score to be minimized, and Platina wants the score to be maximized. This game is so much fun that we are going to play it T times. All games will use the same array A, but different games might use different values of L and R.

Assuming that both players are playing optimally, find the number of points they will get in each of the games played.

Input

The first line contains two integers N and T ($1 \le N, T \le 500\,000$): the length of the array and the number of games played, respectively.

In the second line, the array values $A[1]$, $A[2]$, $A[3]$, ..., $A[N]$ are given ($1 \le A[i] \le 10^9$).

Each of the next T lines describes a game by two positive integers L_i and R_i ($1 \le L_i \le R_i \le N$): the values of L and R to use for this game.

Output

For each game, print the score in this game on a separate line.

Example

standard input	standard output
8 5 7 10 3 1 9 5 5 2 1 5 2 2 5 8 1 8 3 5	4 1 4 7 3