New Yokee

https://szkopul.edu.pl/problemset/problem/NewYokee/site/?key=statement

Architecture of New Yokee

At the main street in New Yokee, there are *n* buildings (numbered from *1* to *n*), whose heights describes the sequence h = (h_1, h_1, … h_n).

What is the fun for ghost?

Ghost Speedyy loves to jump over buildings. Our hero can jump any distance far ahead, but always no more than one meter up.

In this way

- he can jump from the building with height *x* to building with height of *x+1*
- he cannot jump from the building with height *x* to building with height of *x+2*

Speedy can fly through interiors of higher buildings when jumping from building A to B. He is the ghost!

Sprint performed by ghost

Speedyy would like to arrange an AB-sprint over the buildings of the main street of New Yokee. Ghost always starts from street level and on the left side of the building A (in front of this building A). The height of street is equal to 0. Then Speedyy will fly always to the right according to his skills. Ghost would like to jump on the highest possible building before B. If B is the highest possible building - it is also great.

You are part of the game!

Ghost takes under considerations many possible routes between different A and B buildings. Tell him for maximum height he can achieve for each of the route.

Input

In the first line of the standard input, there are 2 integers *n* and *m* separated by space ($1 \leq n, m \leq 180\,00$) meaning number of building in New Yokee (*n*) and number of ghost queries (*m*).

In the second line, there are *n* number ($1 \leq h_i \leq 180\,000$) meaning heights of building in New Yokee from 1 to *n*.

In the following *m* lines there are *m* queries. Each line has 2 numbers A_i and B_i separated by space ($1 \leq A_i, B_i \leq n$) meaning: A_i – building where ghost start its sprint, B_i – the last building where ghost can end his sprint

Output

You should write *m* lines. In line number *i* you should write just 1 number – the answer to query number *i*:

The highest possible building Speedyy can achieve flying from A_i to B_i

Examples

Example 1	**Example 2**	**Example 2**
Input	Input	Input
9 2	4 2	14 3
2 1 3 2 1 3 6 1 2	1 2 3 4	2 1 3 2 1 4 3 2 1 5 4 3 2 1
1 8	1 3	1 14
3 9	2 4	10 14
Output	Output	3 14
3	3	Output
2	0	4
		1
		3

Explanation of Example 1:

Indexes: 1 2 3 4 5 6 7 8 9

Heights of buildings: 2 1 3 2 1 1 3 5 2

Question 1: 1 8

What is the highest building that Speedyy can achieve starting from building 1 level 0 and finishing not further than on building 5?

a. At first Speedy goes up to height 1 (building 2)
b. Than he goes up to height 2 (building 4)
c. Than he goes up to height 3 (building 7)

So, the answer is 3. This is the highest level Speedy can achieve between buddings 1 and 8

Question 2: 3 9

What is the highest building that Speedyy can achieve starting from building 3 level 0 and finishing not further than on building 5?

a. At first Speedy goes up to height 1 (building 5 or 6)
b. Than he goes up to height 2 (building 9)

So, the answer is 2. This is the highest level Speedy can achieve between buddings 3 and 9