# Farmer John and the Cows

## Description

Everyone knows that FJ (abbreviation for Farmer John) has many cows in USA. He has $N$ cows live in a straight line and he names the cows as cow 1, cow 2, ..., cow $N$ by order. However, due to some economic difficulties, FJ has to sell some of his cows to keep his farm.

This is indeed a hard decision, for that FJ loves all his cows and he takes care of them every day. He is afraid that the cows will feel lonely after some of their cow friends being traded. To prevent his cows from feeling lonely, he decides to keep a continuous interval of the cows and sell the other cows. Thus the cows will not be separated after the deal. But this is not enough, FJ also concerns the "social value" of each cow.

Each cow has a height value $h$, and cow $i$ can see cow $j$ if and only if there's no cow between cow $i$ and cow $j$ with height value strictly greater than that of cow $i$ (That is, cow $i$ can see cow $j$ does not imply cow $j$ can see cow $i$). The social value of a cow is defined as the number of cows it can see.

FJ haven't make the decision, but he had found $Q$ choices of the selling plan. That is, he has $Q$ intervals and the $i$-th interval $[l_i, r_i]$ means to sell all the cows except the cow $l_i$, cow $l_i + 1$, ..., cow $r_i - 1$, cow $r_i$.

FJ want you to find out that for each interval, what is the sum of the social values *after selling the cows* if he decides to sell all the cows except the ones in the interval? Please help FJ to make the decision!

## Input

The first line contains an integer $T$ indicating the total number of test cases. For each test case, the first line contains two integers $N, Q$. The next line contains $N$ integers. The $i$-th number $h_i$ indicating the height value of cow $i$. For the next $Q$ lines, each line contains two integers $l_i, r_i$, indicating a selling plan of FJ.

- $1 \leq T \leq 20$
- $1 \leq N, Q \leq 100000$
- $1 \leq h_i \leq N$
- $1 \leq l_i \leq r_i \leq N$

## Output

For each interval please output an integer indicating the sum of the social values.

## Sample Input

```
1
5 3
3 2 1 5 2
1 4
2 5
3 4
```

## Sample Output

```
15
12
4
```