F. Frequent values

Time limit: 3s

You are given a sequence of n integers $a_1, a_2, \ldots, a_n$ in non-decreasing order. In addition to that, you are given several queries consisting of indices i and j $(1 \leq i \leq j \leq n)$. For each query, determine the most frequent value among the integers $a_i, \ldots, a_j$.

Input

The input consists of several test cases. Each test case starts with a line containing two integers n and q $(1 \leq n, q \leq 100000)$. The next line contains n integers $a_1, \ldots, a_n$ $(-100000 \leq a_i \leq 100000$, for each $i \in \{1, ..., n\})$ separated by spaces. You can assume that for each $i \in \{1, \ldots, n-1\}$: $a_i \leq a_{i+1}$. The following q lines contain one query each, consisting of two integers i and j $(1 \leq i \leq j \leq n)$, which indicate the boundary indices for the query.

The last test case is followed by a line containing a single '0'.

Output

For each query, print one line with one integer: The number of occurrences of the most frequent value within the given range.

Note: A naive algorithm may not run in time!

Sample Input

```
10 3
-1 -1 1 1 1 1 3 10 10 10
2 3
1 10
5 10
0
```

Sample Output

```
1
4
3
```