Data Mining

Description

Sometimes when considering sequences of various objects the value of objects are not important, but only relation which objects are equal to other objects. In such case canonization of the sequence can be considered.

Let us call two sequences of positive integers $a_1, a_2, \ldots, a_n$ and $b_1, b_2, \ldots, b_n$ equivalent if there is a one-to-one mapping $\phi : \mathbb{Z}^+ \to \mathbb{Z}^+$ such that $b_i = \phi(a_i)$ for all i. Lexicographically smallest sequence equivalent to the given one is called its **canonization**. For example, canonization of a sequence $3, 1, 4, 1, 5$ is $1, 2, 3, 2, 4$.

Shik is simply good at it. He found a new method to test whether the canonization is correct. Given a sequence, Shik will pick a contiguous subsequence and calculate the sum of its canonization for many times. Now he asks you to implement the method he found. Can you help him?

Input

The first line contains an integer T indicating the total number of test cases. Each test case starts with one line containing two integers n, q, denoting the length of the sequence and the number of times he picks the contiguous subsequence. Then the second line contains n integers a_i, denoting the sequences. Then q lines, each contains 2 integers l_i, r_i, denoting the range of contiguous subsequence he picks.

- $1 \leq T \leq 100$
- $3 \leq n, q \leq 50000$
- $1 \leq a_i \leq 10^9$
- $1 \leq l_i \leq r_i \leq n$
- There are at most 3 test cases with $n + q > 1000$

Output

For each query, please output the answer in single line.

Sample Input

```
1
5 7
3 1 4 1 5
1 3
1 4
2 3
3 5
2 4
1 5
3 4
```

Sample Output

```
6
8
3
6
4
12
3
```