Problem G: Bookstore

Time limit: 7s, memory limit: 512MB.

You own a very peculiar bookstore, which sells old books, but you store all of them on a single shelf, in random order, and you do not care about the books' content. Nor do your clients – they tend to come into the store and simply ask for "all the books on that shelf, starting from *this* one and ending *here*". To be precise, every client buys some connected (and non-empty) fragment of books from the shelf.

Sometimes, though, you get more picky clients, who expect more from a book – actually, they expect it to have the right size. A picky client wants a fragment of shelf in which all the books have their height not smaller than l and not greater than h.

Given a sequence of integers – the heights of all the books on the shelf – determine the number of possible connected fragments which satisfy these requirements.

Also, we mentioned that the books are in *random* order. Formally, the input sequence was generated with the following program, for some values of $N \in \{1, 2, \ldots, 100\,000\}$ and $M = 10^q$ with $q \in \{1, 2, \ldots, 6\}$.

```
srand48(N + M);
for (int i = 0; i < N; ++i)
  a[i] = 1 + lrand48() % M;
```

You do not actually need to know how the RAND48 library works. It is enough to assume that the function `lrand48` returns 31-bit non-negative integers picked uniformly at random.

Input

The first line of input contains the number of test cases z ($1 \leqslant z \leqslant 5$). The test cases follow, each one in the following format:

The first line of a test case contains the number of books n and the number of picky clients k ($1 \leqslant n \leqslant 200\,000$, $1 \leqslant k \leqslant 500\,000$).

The second line contains a sequence of n positive integers not exceeding $1\,000\,000$ – the heights of all the books, from the first (leftmost) to the last (rightmost) one.

The final k lines describe the clients' requirements. The i-th of these lines contains two integers l_i, h_i ($1 \leqslant l_i \leqslant h_i \leqslant 1\,000\,000$), describing a client that wants books to be not smaller than l_i and not greater than h_i.

The total number of books in all test cases does not exceed $600\,000$, and the total number of clients in all test cases does not exceed $1\,500\,000$.

Output

For every client, output the number of non-empty connected fragments of the book sequence which safisty the client's requirements.

Example

For the input data	The correct answer is
2 10 3 9 9 3 2 1 9 6 9 1 7 1 13 6 6 2 9 5 1 66575 45720 67904 18764 35162 20000 80000	55 1 17 7