Task: STO
Stock Exchange

Stage CPSPC 2007. Day third. Source file `sto.*` *14.06.2007*

Available memory: 32 MB.

Professor G. Reedy is writing a computer program, which will help him to earn a lot of money from buying and selling shares on a stock exchange. He is particularly interested in shares of company called Noway. Professor knows that the key to success is careful examination of a stock exchange's history. He was observing share prices for n days and he knows that on i-th day Noway's share was worth p_i dollars ($1 \leq i \leq n$). For simplicity you can assume that all prices are different.

Professor would like to do m queries on this data and he need your help in writing module which will answer these queries. He is mainly interested in queries of form $\langle b, e, l, u \rangle$ which encodes following question: for how many days from b-th to e-th day (inclusive) the price of Noway's share was between l and u dollars (inclusive)?

Professor will test your module in a strange way. For an i-th query ($1 \leq i \leq m$) he will give you four integers: b_i, e_i, l_i and u_i. You will have to calculate integer s_i — an answer to a query $\langle b_i, e_i, l_i + s_{i-1}, u_i + s_{i-1} \rangle$ (where s_{i-1} is an answer to the previous query). Assume that $s_0 = 0$.

Task

Write a program which:

- reads stock exchange history and professor's queries from the standard input,
- calculates answers to queries,
- writes the answers to the standard output.

Input

The first line of input contains two integers n and m ($1 \leq n \leq 100\,000$, $1 \leq m \leq 1\,000\,000$), separated with a space. The next n lines describe price fluctuations of shares: line number $i+1$ contains integer p_i ($1 \leq p_i \leq 10^9$). The next m lines describe professor's queries: line number $i+n+1$ contains four integers b_i, e_i, l_i and u_i ($1 \leq b_i \leq e_i \leq n$, $1 \leq l_i + s_{i-1} \leq u_i + s_{i-1} \leq 10^9$), separated with spaces.

Output

You should write m lines to output. Line number i should contain one integer s_i.

Example

For the input data:

```
5 4
17
3
5
94
8
1 5 4 113
3 4 -2 0
2 5 2 93
2 2 0 0
```

the correct result is:

```
4
0
3
1
```