DMPG '17 G2 - Holy Grail War

Arthuria is preparing to fight Gilgamesh for the Holy Grail! Unfortunately, Gilgamesh activates his Noble Phantasm, *Gate of Babylon*, and summons N swords, and the ith has destructive power d_i. Luckily for Arthuria, her Noble Phantasm, *Excalibur*, is capable of destroying any contiguous subsequence of Gilgamesh's swords. As such, Arthuria gives you Q queries of two possible forms:

1. `S i x`: Gilgamesh swaps out the ith sword for one of destructive value x.
2. `Q l r`: Arthuria simulates destroying the contiguous subsequence **with the maximum sum** in the range $[l, r]$. Note that **she does not actually destroy these swords**.

As Arthuria's master, you wish to know the answer to all of the queries of the form `Q l r`. Help win the Holy Grail!

Input Specification

Line 1: Two space separated integers, N and Q.
Line 2: N space separated integers, d_i, the destructive power of Gilgamesh's **original** N swords.
Lines $3 \ldots Q + 2$: Q valid queries.

Output Specification

Print the answer to each query of the form `Q l r`.

Subtasks

For all subtasks, $1 \le i \le N$, and $1 \le l \le r \le N$.

Subtask 1 [5 points]

$1 \le N \le 100$
$1 \le Q \le 100$
$-10^9 \le d_i \le 10^9$

Subtaks 2 [5 points]

$1 \le N \le 10^5$
$1 \le Q \le 10^5$
$1 \le d_i \le 10^9$

Subtask 3 [30 points]

$1 \le N \le 1000$
$1 \le Q \le 10^5$

$-10^9 \le d_i \le 10^9$

All Q queries will be of the form `Q l r`.

Subtask 4 [60 points]

$1 \le N \le 10^5$
$1 \le Q \le 10^5$
$-10^9 \le d_i \le 10^9$

Sample Input

```
8 2
1 2 3 4 5 6 7 8
S 1 2
Q 1 3
```

Sample Output

```
7
```