
Maximum disparity

Input file: **standard input**
Output file: **standard output**
Time limit: 3 seconds
Memory limit: 64 megabytes

Mohit and Sattu are playing a game.

Sattu has an array of integers A , and asks Mohit questions of the format $x \ y$, to answer which Mohit needs to find $\max\{A[i] - A[j] \mid x \leq i, j \leq y\}$. Also to make things more interesting, Sattu sometimes changes some elements of the array like $i \ x$ which means that $A[i]$ is now equal to x .

Sadly, Mohit is quite dumb, so he needs you to play the game for him.

Input

The first line contains N , the size of A , and Q , the number of questions + updates Sattu makes ($1 \leq N, Q \leq 10^6$).

The second line contains N space separated integers, the elements of the array A ($1 \leq A[i] \leq 10^8$).

Each of the next Q lines contains either a query or an update

- $1 \ x \ y$: Sattu asked a question $x \ y$ ($1 \leq x \leq y \leq N$).
- $2 \ i \ x$: Sattu changed $A[i]$ to x . ($1 \leq i \leq N, 1 \leq x \leq 10^8$).

Output

For every question asked by Sattu, print the max difference as defined in the statement.

Example

standard input	standard output
5 5	4
1 2 3 4 5	2
1 1 5	5
1 2 4	
2 2 7	
2 1 2	
1 1 2	

Note

WARNING: large I/O, please use **scanf/printf** instead of **cin/cout**.

It is very unlikely that a solution in python will pass for this problem (in testing we could not get it to go faster than a minute per test case)