Problem I. ADD, DIV, MAX

Input file:	*standard input*
Output file:	*standard output*
Time limit:	5 seconds
Memory limit:	256 mebibytes

You are given an integer sequence $a_0, a_1, \ldots, a_{N-1}$.

You have to perform Q queries, each query is one of the following:

- **ADD** $t = 0$, `l r x`: for each i between l and r inclusively, $a_i = a_i + x$.
- **DIV** $t = 1$, `l r x`: for each i between l and r inclusively $a_i = \text{floor}(a_i/x)$, where $\text{floor}(y)$ is the biggest integer that is not greater than y.
- **MAX** $t = 2$. `l r x=0`: print $\max(a_l, a_{l+1}, \ldots, a_r)$.

Input

Input is given in the following format:

N Q

a_0 a_1 ... a_{N-1}

t_1 l_1 r_1 x_1

t_2 l_2 r_2 x_2

...

t_Q l_Q r_Q x_Q

Constraints:

All input values are integers, $1 \le N, Q \le 200\,000$, $0 \le a_i \le 10^8$, $t_i = 0, 1, 2$, $0 \le l_i \le r_i \le N - 1$, $1 \le x_i \le 1000$ if $t_i \ne 2$, $x_i = 0$ if $t_i = 2$.

Output

For each **MAX** query, print $\max(a_l, a_{l+1}, ..., a_r)$.

Examples

standard input	standard output
5 7 1 2 3 4 5 2 0 4 0 0 0 1 10 2 0 4 0 2 2 2 0 1 0 1 4 2 0 0 0 2 1 1 0	5 12 3 2 3

standard input	standard output
4 7 0 1 0 1 2 0 3 0 0 0 3 1 1 0 3 2 2 0 3 0 0 0 3 1 1 0 3 2 2 0 3 0	1 1 1
10 20 13 1 22 8 28 18 23 9 22 27 1 3 4 5 1 8 8 8 0 3 9 5 0 2 6 3 1 1 3 7 2 2 2 0 2 3 5 0 0 1 4 2 2 0 1 0 0 3 9 8 2 1 9 0 0 8 9 5 1 5 7 7 0 3 5 7 0 7 9 7 2 1 6 0 0 1 1 7 1 4 8 10 2 0 9 0 1 5 6 1	3 26 13 40 30 52

Note

For Sample 1,

$\max(1, 2, 3, 4, 5) = 5$
$1, 2, 3, 4, 5 \to 11, 12, 3, 4, 5$
$\max(11, 12, 3, 4, 5) = 12$
$\max(3) = 3$
$11, 12, 3, 4, 5 \to 2, 3, 3, 4, 5$
$\max(2) = 2$
$\max(3) = 3$