Protection War

Input file:	`standard input`
Output file:	`standard output`
Time limit:	7 seconds
Memory limit:	1024 megabytes

The city of Country X is under attack by Country Y! To defend itself, Country X has set up n rows of fortifications, numbered consecutively from $1, 2, \ldots, n$. The military strength of the fortification numbered i is a_i. A fortification is considered **defeated** if its military strength is zero. Initially, no fortifications are **defeated**.

The battle lasts for a total of q days, and each morning, one of the following events occurs:

- Troop Movement: Given parameters x, y, the military strength of the fortification numbered x is set to y.
- Reinforcement: Given parameters l, r, v, the military strength of the fortifications numbered $l, l+1, \ldots, r$ is increased by v (including fortifications that are already **defeated**).
- Recruitment: The military strength of all fortifications that are not **defeated** is increased by 1.
- Training: Let $b_i = \max\{r - l + 1 \mid 1 \le l \le i \le r \le n, \text{s.t.} \forall l \le j \le r, a_j > 0\}$, which is the length of the longest continuous segment containing fortification i that has not been **defeated**. For all $1 \le i \le n$, set $a_i := a_i + b_i$.
- Parade: Given parameters l, r, inquire about the total military strength of the fortifications numbered $l, l+1, \ldots, r$.

Every evening, a rout event occurs: For the fortification numbered i, if $i < n$ and the fortification numbered $i+1$ has already been **defeated** by noon that day, then this fortification will also be **defeated** (i.e., its military strength becomes zero).

As the commander-in-chief of Country X, you need to provide the correct result for each "parade" operation.

Input

The first line contains two integers, n and q, representing the number of fortifications and the number of days, respectively.

The second line contains n integers, representing $a_1, \ldots, a_n$, the initial military strength of each fortification.

The next q lines describe the events that occur each morning for q days. In the i-th line, the first integer op indicates what event occurs on the i-th day:

- If $op = 1$, a troop movement occurs, and the parameters x, y are given next.
- If $op = 2$, a reinforcement occurs, and the parameters l, r, v are given next.
- If $op = 3$, a recruitment occurs.
- If $op = 4$, a training occurs.
- If $op = 5$, a parade occurs, and the parameters l, r are given next.

It is guaranteed that $1 \le n, q \le 3 \times 10^5$ and $1 \le a_i \le 10^5$. For the troop movement event, it is guaranteed that $1 \le x \le n$ and $0 \le y \le 10^5$. For the reinforcement event, it is guaranteed that $1 \le l \le r \le n$ and $1 \le v \le 10^5$. For the parade event, it is guaranteed that $1 \le l \le r \le n$.

Output

For each "parade" event, output one integer per line representing the answer.

Example

standard input	standard output
10 8 1 2 3 4 5 6 7 8 9 10 1 5 0 4 5 1 10 2 1 7 10 5 1 7 1 5 0 3 5 1 7	74 97 71