City Redevelopment (`renovations`)

Alessandro has finally been elected as the new mayor of Pordenone! With great power comes great responsibilities, and so he now has to keep his promises and redevelop part of the city to create a new clubbing centre for Pordenone's youngsters.

Figure 1: Artist's impression of the hypothetical Pordenone's night life. *2021, colourized.*

The city of Pordenone is composed of N buildings, numbered from 1 to N all aligned along a single road, and each building i has a *beauty value* V_i. Pordenone's youngsters will only accept to use a clubbing centre encompassing a contiguous sequence of buildings from l ro r ($1 \leq l \leq r \leq N$), consisting only of buildings with a beauty value of at least K, and having a *total beauty* (sum of the values of each building) of **exactly** s.[1] Since Alessandro is particularly indecisive, before proceeding with the necessary renovations he wants to calculate in **how many** different ways the buildings in the $[l; r]$ interval could be renovated (thus, increasing their beauty value V_i) in order to achieve a total beauty of exactly s. For instance, assume that Pordenone is composed of $N = 6$ buildings, with the following beauty values:

$$13 \ 0 \ 30 \ 5 \ 15 \ 25$$

and assume that Pordenone's youngsters want a clubbing centre in the interval between $l = 2$ and $r = 4$, with a minimal beauty of $K = 20$ and a total beauty of $s = 73$. There are 10 possible ways for Alessandro to meet their conditions, which would produce the following beauty values:

```
13 20 30 23 15 25    13 20 31 22 15 25    13 20 32 21 15 25
13 20 33 20 15 25    13 21 30 22 15 25    13 21 31 21 15 25
13 21 32 20 15 25    13 22 30 21 15 25    13 22 31 20 15 25
                     13 23 30 20 15 25
```

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[1]Youngsters from Pordenone are *very* picky: they don't like both too ugly nor too classy neighbourhoods.

However, Alessandro indecisiveness is going to cost him the success of his quest! While he is pondering on how to perform the renovations, the beauty values of buildings and the youngsters' preferences l, r, s keep changing. In particular, you are given Q different queries to handle, each of them of one of two possible kinds:

- 1 a b → building a has changed its beauty value to $V_a = b$;

- 2 l r s → youngsters now want a clubbing centre in the interval $[l; r]$ with a total beauty of s.

Help Alessandro by keeping track of the number of different ways the buildings could be renovated to meet the youngsters' requirements, every time they change their mind!

> ☞ Among the attachments of this task you may find a template file `renovations.*` with a sample incomplete implementation.

Input

The first line contains the three integers N, Q, K. The second line contains N integers V_i. The following Q lines can be of the kind 1 a b or 2 l r s, depending on which kind of query they represent.

Output

For every 2 l r s query in the input, you should write a line with an integer: the number of different ways buildings could be renovated to meet the youngsters' criteria **modulo** $10^9 + 7$.

> ✍ The *modulo* operation $(a \bmod m)$ can be written in C/C++/Python as `(a % m)` and in Pascal as `(a mod m)`. To avoid the *integer overflow* error, remember to reduce all partial results through the modulus, and not just the final result!
> *Notice that if $x < 10^9 + 7$, then $2x$ fits into a* C/C++ `int` *and* Pascal `longint`.

Constraints

- $1 \le N \le 100\,000$.
- $1 \le Q \le 200\,000$.
- $0 \le K \le 1000$.
- $0 \le V_i \le 100$ for each $i = 1 \ldots N$.
- $1 \le a \le N$ and $0 \le b \le 100$ for each query of the first kind.
- $1 \le l \le r \le N$ and $0 \le s \le 2\,000\,000$ for each query of the second kind.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points)   Examples.

– **Subtask 2** (15 points) $N, Q \le 10$ and $s \le 10$ in every query.

– **Subtask 3** (25 points) $N \le 2000$, $Q \le 5000$, $K = 0$.

- **Subtask 4** (20 points) $N \leq 2000$, $Q \leq 5000$.

- **Subtask 5** (20 points) $K \leq 20$.

- **Subtask 6** (20 points)   No additional limitations.

Examples

input	output
6 1 20 13 0 30 5 15 25 2 2 4 73	10
4 5 2 0 0 0 3 2 1 4 10 1 1 2 2 2 3 3 1 2 4 2 1 2 6	4 0 1

Explanation

The **first sample case** is described in the problem statement.

In the **second sample case**, Pordenone is composed of four buildings with the following initial beauty values:

$$0 \ 0 \ 0 \ 3$$

And the minimum beauty accepted by youngsters is 2. Firstly, Alessandro needs to build a clubbing centre encompassing the whole city, and this can be done in 4 ways:

$$2 \ 2 \ 3 \ 3 \quad 2 \ 3 \ 2 \ 3 \quad 3 \ 2 \ 2 \ 3 \quad 2 \ 2 \ 2 \ 4$$

While Alessandro is pondering, the beauty of building 1 changes:

$$2 \ 0 \ 0 \ 3$$

The youngsters' preferences also change, and now Alessandro needs to build the centre on the two middle buildings with a total beauty of 3. However, this is not possible: both buildings would need to have a minimum beauty of 2, their total beauty is going to be at least 4. Then, building 2 also changes:

$$2 \ 4 \ 0 \ 3$$

Now Alessandro needs to build the centre on the leftmost two buildings with a total beauty of 6. This is possible in a single way: by just not doing anything.