Poker Tournament

Time limit: *5000 ms*
Memory limit: *512 MB*

There are N towns numbered from 0 to $N-1$. Each town has a poker club, where the i-th one has A_i members. Members of different clubs are distinguishable, but members of the same club are not. For all poker tournaments, if the i-th club decides to participate, it has to send at least 1 and no more than A_i members. If a club doesn't participate, we assume that it has sent 0 of it's members.

Your task is to process q events of three types:

Type 0: Given L_i, R_i, C_i change the value of A_j to C_i for every j satisfying $L_i \leq j \leq R_i$,

Type 1: Given L_i, R_i, C_i change the value of A_j to $max(A_j, C_i)$ for every j satisfying $L_i \leq j \leq R_i$,

Type 2: Given L_i, R_i, K_i, a tournament is taking place where only clubs numbered from L_i to R_i can participate and **exactly** K_i clubs participate. Count the number of different sets of players that could appear in the tournament modulo 998244353. Two sets of players are considered different if there exists a club that has sent a different number of players in those sets.

Standard input

The first line of input contains two integers N and Q. The next line contains N numbers A_i. The next Q lines describe consecutive events. Description of the i-th event starts with a number T_i denoting the type of the $i-th$ event. If $T_i = 0$ or $T_i = 1$, three numbers L_i, R_i, C_i follow. Otherwise three numbers L_i, R_i, K_i follow.

Standard output

The i-th line of output should contain the answer to the i-th Type 2 event — number of different sets of players that could play in the i-th tournament.

Constraints and notes

- $1 \leq N, Q \leq 5 \cdot 10^4$,
- $0 \leq A_i < 998244353$ for i from 0 to $N-1$,
- $0 \leq T_i \leq 2$ for i from 0 to $Q-1$,
- $0 \leq L_i \leq R_i < N$ for i from 0 to $Q-1$,
- $0 \leq C_i < 998244353$ for i from 0 to $Q-1$,
- $1 \leq K_i \leq 50$ for i from 0 to $Q-1$

Input	Output
10 9 1 2 3 4 5 6 7 8 9 10 0 4 9 3 1 7 7 5 2 2 8 1 0 4 9 4 1 3 6 5 2 0 9 3 0 3 9 10 1 3 7 8 2 3 6 2	24 6310 600