6738 Bridges

Duryodhana built an archipelago (collection of islands) with P islands in the holy lake of Mansarovar. Each island is a narrow rectangle running North-South, with the i-th island having length $k[i]$.

The islands are numbered such that the westernmost (leftmost) island is number 1, next is 2, ..., with the easternmost (rightmost) being P. The southernmost point of i-th ($1 \leq i \leq P$) island is labeled $(i, 1)$ and northernmost point is $(i, k[i])$. The points in between are labeled according to their distance from the southernmost point.

A walk-a-thon is being organized with K Kaurava walkers, where each walker is labeled uniquely with labels from 1 to i. Every walker starts on island 1 and ends on island P.

The i-th walker starts at $(1, i)$ and ends at (P, i).

All walkers start simultaneously from island 1 and have to reach island P.

Bridges have been built to enable walkers to move between islands.

A bridge connects two adjacent islands and permits traffic only from west to east. A bridge starts at point (i, a) on island i and ends at point $(i + 1, b)$ on island $i + 1$.

No two bridges cross, but more than one bridge can start/end at the same point.

In a single time unit, all walkers move to the next island, i.e., if they are at island i currently, they need to move to island $i + 1$ at the next point of time. The walkers move from one island to another by walking along the bridges.

As soon as a walker reaches the end of one bridge, he or she will immediately take another bridge starting at the same point and leading to the next island, i.e., the walker is not allowed to move within the island and is not allowed to take rest.

A walk-a-thon is said to be valid if two walkers never start at or arrive at the same point of any island at the same time. Two walk-a-thons of K walkers through the archipelago are considered different if at least one walker took a different route. Two walk-a-thons that have the same routes but differ only in the identity of the walkers are considered identical.

Assuming all walkers start at the same time, find the number of valid and different walk-a-thons that can take place.

Input

The first line contains T, the number of test cases. The description of T test cases follow.

The first line of each test case contains three integers, P, K and B denoting the number of islands, the number of walkers, and the number of bridges respectively.

The next line contains P integers, the ith integer represents $k[i]$, the length of i-th island.

The length of first and last island will always be K.

The starting points of ith walker is $(1, i)$, and his ending point is (P, i).

The next B lines contain three integers each: l, a, b which indicates a bridge from (l, a) to $(l + 1, b)$.

Output

For each test case, output a single integer, the number of walk-a-thons possible *modulo* $10^9 + 7$.

Constraints:

$1 \leq P \leq 80$

$1 \leq K \leq 50$

$0 \leq B \leq 8000$
$1 \leq k[i] \leq 80$
The bridges between two adjacent islands do not intersect, except at end points.
$k[1] = k[P] = K$
$1 \leq L < P$
$1 \leq a \leq k[L]$
$1 \leq b \leq k[L+1]$

Sample Input

```
2
3 3 6
3 3 3
1 1 1
1 2 2
1 3 3
2 1 1
2 2 2
2 3 3
3 3 14
3 5 3
1 1 1
1 1 2
1 2 2
1 2 3
1 2 4
1 3 4
1 3 5
2 1 1
2 2 1
2 3 1
2 3 2
2 4 2
2 4 3
2 5 3
```

Sample Output

```
1
6
```