

Extremum Permutations

Let's consider a permutation $P = \{p_1, p_2, \dots, p_N\}$ of the set of $N = \{1, 2, 3, \dots, N\}$ elements .

P is called a magic set if it satisfies both of the following constraints:

- Given a set of K integers, the elements in positions a_1, a_2, \dots, a_K are less than their adjacent elements, i.e., $p_{a_i-1} > p_{a_i} < p_{a_i+1}$
- Given a set of L integers, elements in positions b_1, b_2, \dots, b_L are greater than their adjacent elements, i.e., $p_{b_i-1} < p_{b_i} > p_{b_i+1}$

How many such magic sets are there?

Input Format

The first line of input contains three integers N, K, L separated by a single space.
The second line contains K integers, a_1, a_2, \dots, a_K each separated by single space.
the third line contains L integers, b_1, b_2, \dots, b_L each separated by single space.

Output Format

Output the answer modulo 1000000007 (10^9+7).

Constraints

- $3 \leq N \leq 5000$
- $1 \leq K, L \leq 5000$
- $2 \leq a_i, b_j \leq N-1$, where $i \in [1, K]$ AND $j \in [1, L]$

Sample Input #00

```
4 1 1
2
3
```

Sample Output #00

```
5
```

Explanation #00

Here, $N = 4$ $a_1 = 2$ and $b_1 = 3$. The 5 permutations of $\{1,2,3,4\}$ that satisfy the condition are

- 2 1 4 3
- 3 2 4 1
- 4 2 3 1
- 3 1 4 2
- 4 1 3 2

Sample Input #01

```
10 2 2
2 4
3 9
```

Sample Output #01

```
161280
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