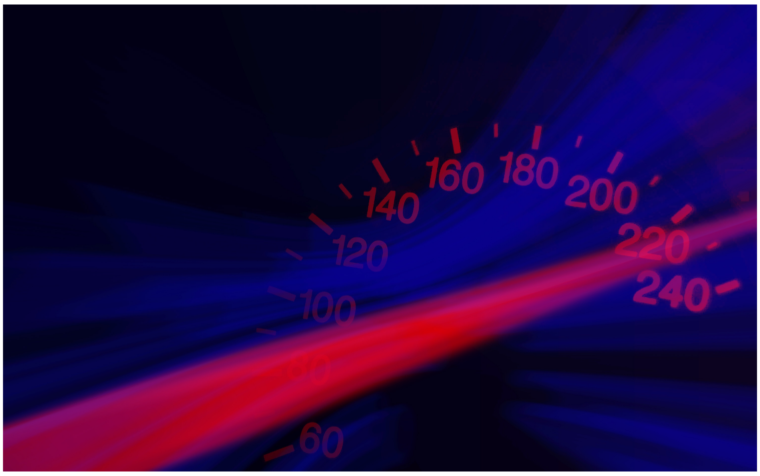
Highway's Speed Limits (speeding)

On a nice sunny day, Alice was driving through a long highway. She was enjoying the weather so much that she didn't pay attention to the speed limits... Can she get away without having to pay a fine?



Driving faster than the allowed speed limit is an offense in most countries.

There are N checkpoints on the highway where the speed of the cars is measured. At the i-th checkpoint, the maximum allowed speed is A_i. Alice's speed has been measured at each checkpoint. Due to a bug in the computer system of the police, the order of these measurements (i.e., which measurement belongs to which checkpoint) is unknown. The police officers are wondering, in how many out of all the possible orders would Alice *not* have to pay a fine, i.e. satisfy the speed limit constraint at all the checkpoints?

Since this number can be very large, you should output the result modulo $10^9 + 7$.

Input

The first line contains the only integer N. The second line contains N integers A_i, the maximum allowed speed at the checkpoints. The third line contains N integers B_i, Alice's speed at the checkpoints in some *arbitrary* order.

Output

You need to write a single line with an integer: the number of permutations of the sequence $B = (B_0, \ldots, B_{N-1})$ modulo $10^9 + 7$, for which all of its elements are less than or equal to the corresponding element in the sequence $A = (A_0, \ldots, A_{N-1})$.

> ✍ The *modulo* operation ($a \bmod m$) can be written in C/C++/Python as `(a % 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`.

Constraints

- $1 \le N \le 200\,000$.
- $1 \le A_i, B_i \le 10^9$ for each $i = 0, 1, \ldots N-1$.

Scoring

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (10 points) $N \le 10$.

– **Subtask 3** (30 points) $N \le 1000$.

– **Subtask 4** (60 points) No additional limitations.

Examples

input	output

`3`
`4 2 5`
`3 4 1`
	`2`

`4`
`6 7 3 4`
`5 5 1 2`
	`4`

Explanation

In the **first sample case**, the two suitable permutations of B are $(3, 1, 4)$ and $(4, 1, 3)$. As an example, $(3, 1, 4)$ is suitable, because $4 \ge 3$, $2 \ge 1$ and $5 \ge 4$.

In the **second sample case**, the four suitable permutations of B are $(5, 5, 1, 2)$, $(5, 5, 1, 2)$, $(5, 5, 2, 1)$ and $(5, 5, 2, 1)$. Observe that instances of the same number count as different elements.