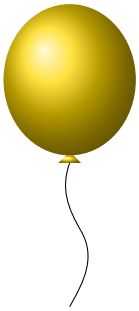
G Brackets Matching



Time limit: 1.0s
Memory limit: 256MB

You are given the coordinates of brackets placed on a number line. There are exactly N opening brackets located at coordinates $(a_1, a_2, \ldots, a_N)$, and exactly N closing brackets located at coordinates $(b_1, b_2, \ldots, b_N)$.

Each opening bracket must be connected to exactly one closing bracket, forming N pairs.

A pairing is considered **valid** if for every matched pair (a_{p_i}, b_{q_i}), the following condition holds: $(a_{p_i} < b_{q_i})$. For any valid pairing, define the total distance as $\sum_{i=1}^{N} |a_{p_i} - b_{q_i}|$, where every opening bracket is matched with a distinct closing bracket.

Among all possible matchings between opening and closing brackets, find the minimum possible total distance. Then, calculate the number of different matchings that achieve this minimum total distance.

Two matchings are considered different if at least one opening bracket is connected to a different closing bracket.

Input

The first line contains an integer t $(1 \leq t \leq 1000)$ — the number of test cases.

For each test case:

- The first line contains an integer n — $(1 \leq n \leq 2 \times 10^5)$ — the number of opening and closing brackets.
- The second line contains n integers $(-10^9 \leq a_i \leq 10^9)$ — a_i denotes the coordinate of the i_{th} opening bracket.
- The third line contains n integers $(-10^9 \leq b_i \leq 10^9)$ — b_i denotes the coordinate of the i_{th} closing bracket.

It is guaranteed that the sum of n over all test cases does not exceed 2×10^5.

It is guaranteed that all $2 * n$ coordinates are pairwise distinct.

Output

For each test case, output a single integer — the number of matchings that achieve the minimum possible total distance.

The answer should be printed modulo $10^9 + 7$.

Samples

Sample input 1	Sample output 1
2 2 1 8 2 9 4 1 2 3 4 5 6 7 8	1 24