

D. Lesson Timetable

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

When Petya has free from computer games time, he attends university classes. Every day the lessons on Petya's faculty consist of two double classes. The floor where the lessons take place is a long corridor with M classrooms numbered from 1 to M , situated along it.

All the students of Petya's year are divided into N groups. Petya has noticed recently that these groups' timetable has the following peculiarity: the number of the classroom where the first lesson of a group takes place does not exceed the number of the classroom where the second lesson of this group takes place.

Once Petya decided to count the number of ways in which one can make a lesson timetable for all these groups. The timetable is a set of $2N$ numbers: for each group the number of the rooms where the first and the second lessons take place. Unfortunately, he quickly lost the track of his calculations and decided to count only the timetables that satisfy the following conditions:

- 1) On the first lesson in classroom i exactly X_i groups must be present.
- 2) In classroom i no more than Y_i groups may be placed.

Help Petya count the number of timetables satisfying all those conditions. As there can be a lot of such timetables, output modulo $10^9 + 7$.

Input

The first line contains one integer M ($1 \leq M \leq 100$) — the number of classrooms.

The second line contains M space-separated integers — X_i ($0 \leq X_i \leq 100$) the amount of groups present in classroom i during the first lesson.

The third line contains M space-separated integers — Y_i ($0 \leq Y_i \leq 100$) the maximal amount of groups that can be present in classroom i at the same time.

It is guaranteed that all the $X_i \leq Y_i$, and that the sum of all the X_i is positive and does not exceed 1000.

Output

In the single line output the answer to the problem modulo $10^9 + 7$.

Examples

input
3 1 1 1 1 2 3
output
36

input
3 1 1 1 1 1 1
output
6

Note

In the second sample test the first and the second lessons of each group must take place in the same classroom, that's why the timetables will only be different in the rearrangement of the classrooms' numbers for each group, e.g. $3! = 6$.