Problem H. Hard Combinatorics

Input file:	`stdin`
Output file:	`stdout`
Time limit:	1 second

In this problem, you are asked to calculate the following formula efficiently.

$$\sum_{i=1}^{N}\sum_{j=1}^{N}\binom{A_i + B_j + C_i + D_j}{A_i + B_j}$$

where N, A_i, B_i, C_i, and D_i are all given positive integers. Since the answer can be extremely large, you are only asked to print its remainder modulo $10^9 + 7$.

Input

The first line of input contains a positive integer N ($1 \leq N \leq 10^5$). The following N lines describe A_i, B_i, C_i, and D_i, respectively ($1 \leq A_i, B_i, C_i, D_i \leq 10^3$).

Output

For each test case, print a line of the desired answer.

Examples

stdin	stdout
2 1 2 3 4 5 6 7 8	7789928
5 1 2 3 4 1 2 3 4 4 5 1 2 5 6 7 8 5 6 3 1	8833732