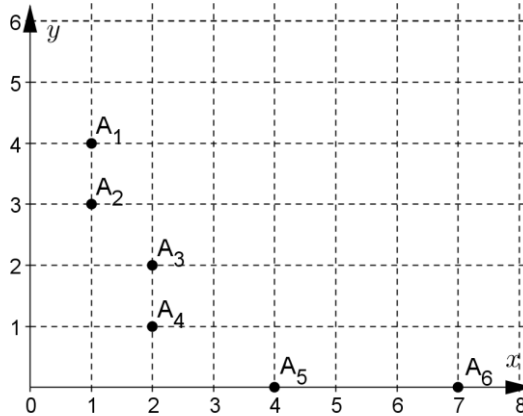


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Task B3. DECREASING SEQUENCES OF POINTS

Let $A_1(x_1, y_1), A_2(x_2, y_2), \dots, A_n(x_n, y_n)$ be a sequence of n different points in the plane with nonnegative integer coordinates. We call this sequence *decreasing* if for any two points $A_i(x_i, y_i)$ and $A_{i+1}(x_{i+1}, y_{i+1})$, it is true that $x_i \leq x_{i+1}$ and $y_i \geq y_{i+1}$. For example, the sequence of points $A_1(1,4), A_2(1,3), A_3(2,2), A_4(2,1), A_5(4,0), A_6(7,0)$ is *decreasing*.



Write program **points**, which calculates the number of *decreasing* sequences of points for which $x_1 + y_1 = a_1, x_2 + y_2 = a_2, \dots, x_n + y_n = a_n$.

Input

The positive integer n is given on the first line of the standard input. There are n nonnegative integers on the second line: a_1, a_2, \dots, a_n .

Output

On a line of the standard output the program has to write by modulo 123456789 the number of the above described sequences.

Constraints

$$n \leq 10000;$$

$$0 \leq a_i \leq 10000 \text{ for } i = 1, 2, \dots, n;$$

$$a_i \neq a_{i+1} \text{ for } i = 1, 2, \dots, n-1.$$

Example

Input

3
4 5 3

Output

10