Problem K. Expected Value

Input file:	*standard input*
Output file:	*standard output*
Time limit:	3 seconds
Memory limit:	16 mebibytes

Here is a game played with sequence $a_1, \ldots, a_n$. On each turn, the player chooses some position $i < n$ uniformly at random, replaces the element a_i with $a_i - a_{i+1}$, and then removes the element a_{i+1} from the sequence. This continues until there is only one element left. What is the expected value of the last element?

Input

The first line of input contains a single integer n ($2 \le n \le 4000$).

The second line of input contains n integers $a_1, \ldots, a_n$ ($1 \le a_i \le 4000$).

Output

If the answer is $\frac{P}{Q}$ such that P and Q are coprime, output a single integer which is $(P \cdot Q^{-1}) \bmod (10^9 + 7)$. It is guaranteed that $Q \not\equiv 0 \pmod{10^9 + 7}$.

Example

standard input	standard output
2 2 1	1

Note

Pay attention to the non-standard memory limit.