Polygon II

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	1024 megabytes

Kostka would like to build a large polygon for himself. He ordered n random segments. The length of the i-th segment will be a random **real** number drawn from a uniform distribution in the range $\mathbf{(0, 2^{a_i})}$. The lengths of the individual segments are independently drawn. Kostka is interested in the probability that it is possible to construct a non-degenerate n-sided polygon from all these segments. Help him calculate it.

It can be proven that for the constraints given below, the result can be represented as a rational number $\frac{\ell}{m}$ such that the denominator m is not divisible by $10^9 + 7$. Your program for the given parameters a_i should output the remainder of dividing this fraction by $10^9 + 7$, i.e., a number x such that $m \cdot x \equiv \ell$ modulo $10^9 + 7$.

Note: Remember that the lengths of the segments are not drawn from the interval $(0, a_i)$, but from $(0, 2^{a_i})$.

Input

The first line of the input contains a single positive integer n ($3 \leq n \leq 1000$), indicating the number of ordered segments. The second line contains a sequence of n integers $a_1, \ldots, a_n$ ($0 \leq a_i \leq 50$), indicating the parameters used to draw the lengths of the individual segments.

Output

The output should contain a single integer - the remainder of the probability divided by $10^9 + 7$ that it is possible to construct a non-degenerate n-sided polygon from the random segments ordered by Kostka.

Example

standard input	standard output
3 0 2 0	166666668

Note

The sought probability is exactly $\frac{1}{6}$.