

Expected Fixed Points

time limit per test: 1 second (2 seconds for Python)

memory limit per test: 250 megabytes

input: standard input

output: standard output

points: 100 · problem code: expectedgifts

There are n people and n gifts, labelled 1 through n . The gifts are handed out according to a uniformly random permutation: every permutation of the n gifts is equally likely.

Person i receives value w_i if they get gift i , and otherwise receives 0. Let X be the total value received by everyone. Output the expected value of X .

It can be shown that the answer can be expressed as a rational number P/Q in lowest terms with Q coprime to $10^9 + 7$. Output $P \cdot Q^{-1} \bmod (10^9 + 7)$.

Input

The first line contains an integer n .

The second line contains n integers $w_1, w_2, \dots, w_n$.

Output

Print a single integer: the expected total value modulo $10^9 + 7$.

Constraints

- $1 \leq n \leq 2 \cdot 10^5$
- $0 \leq w_i \leq 10^9$

Example 1

Input

```
3
1 2 3
```

Output

```
2
```

Explanation

The expected value is $(1 + 2 + 3)/3 = 2$.

Example 2

Input

```
1
7
```

Output

```
7
```

Explanation

There is only one permutation, so person 1 always receives gift 1.

Example 3

Input

```
2
5 5
```

Output

```
5
```

Explanation

Each person gets their own gift with probability $1/2$, so the expected total is $5/2 + 5/2 = 5$.