

Haitang and Water

Input file: **standard input**
Output file: **standard output**
Time limit: 3 seconds
Memory limit: 512 megabytes

There are n bottles lined up, numbered $1, 2, \dots, n$, with the volume of the i -th bottle being a_i . Initially, the first bottle is full of water, and the rest are empty.

Haitang performs the following operations on each bottle in order from left to right:

- Select a bottle uniformly at random from the remaining $n - 1$ bottles.
- Pour the water from the current bottle into the selected bottle until the current bottle is empty or the selected bottle is full.

Given the sequence a , dXqwq wants to know the expected amount of water in each bottle after all operations.

Since dXqwq dislikes floating-point numbers, you only need to print the result modulo 998244353.

Input

The first line contains an integer n ($2 \leq n \leq 10^5$) — the number of bottles.

The second line contains n integers a_i ($1 \leq a_i \leq n$) — the volume of each bottle.

Output

Print n lines, where the i -th line contains the value of the expected volume of water in the i -th bottle after all operations, modulo 998244353.

Examples

| standard input | standard output |
|------------------------|--|
| 2 1 1 | 1 0 |
| 3 3 1 2 | 623902723 623902721 748683265 |
| 9 9 9 8 2 4 4 3 5 3 | 304464287 164086171 361005467 588475930 898938779 983453531 155241138 69810681 467501437 |