Bridge Elimination

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

There is an undirected graph with N vertices. The vertices of this graph are numbered from 1 to N, and each vertex i ($1 \leq i \leq N$) has an integer A_i written on it. Although there are no edges in this graph, you are allowed to freely add edges.

There are $2^{\frac{N(N-1)}{2}}$ ways to add edges to make the graph a simple graph. Calculate the following **score** for each of them and find the sum of the scores modulo 998244353.

- When the graph is not connected, the **score** is 0.
- When the graph is connected, let G be the graph obtained by removing bridges from the original graph. Consider the sum of integers written on the vertices for each connected component of G, and define the product of these sums as the **score**.

Input

The input is given from Standard Input in the following format:

N
$A_1\ A_2\ \ldots\ A_N$

- All values in the input are integers.
- $1 \leq N \leq 400$
- $0 \leq A_i < 998244353$ ($1 \leq i \leq N$)

Output

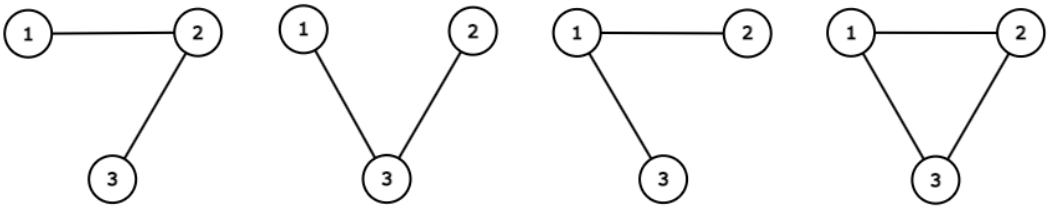
Output the answer.

Examples

standard input	standard output
3 8 5 9	1102
5 4 2 1 3 10	63860
7 229520041 118275986 281963154 784360383 478705114 655222915 970715006	35376232

Note

In the first example, the simple connected undirected graphs with 3 vertices are the following 4 patterns:



The scores are $360, 360, 360, 22$ respectively, so the answer is 1102.