

## C. On the Bench

time limit per test: 2 seconds  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

A year ago on the bench in public park Leha found an array of  $n$  numbers. Leha believes that permutation  $p$  is right if for all  $1 \leq i < n$  condition, that  $a_{p_i} \cdot a_{p_{i+1}}$  is not perfect square, holds. Leha wants to find number of right permutations modulo  $10^9 + 7$ .

### Input

First line of input data contains single integer  $n$  ( $1 \leq n \leq 300$ ) — length of the array.

Next line contains  $n$  integers  $a_1, a_2, \dots, a_n$  ( $1 \leq a_i \leq 10^9$ ) — found array.

### Output

Output single integer — number of right permutations modulo  $10^9 + 7$ .

### Examples

input
3 1 2 4
output
2

input
7 5 2 4 2 4 1 1
output
144

### Note

For first example:

[1, 2, 4] — right permutation, because 2 and 8 are not perfect squares.

[1, 4, 2] — wrong permutation, because 4 is square of 2.

[2, 1, 4] — wrong permutation, because 4 is square of 2.

[2, 4, 1] — wrong permutation, because 4 is square of 2.

[4, 1, 2] — wrong permutation, because 4 is square of 2.

[4, 2, 1] — right permutation, because 8 and 2 are not perfect squares.