

Problem G. 2048

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 512 mebibytes

Rikka writes a 2048-like game with very simple rules.

Rikka has a rectangular board of blocks, with one row and n columns. Initially, all these n blocks are filled with 0s.

The game consists of several rounds. In each round, Rikka will go as follows:

- At the beginning of each round, Rikka will randomly select a zero block with equal probability. Then she will select a random integer j from 1 to m , and put 2^{j-1} into this block. The probability of selecting each particular value of j is given by $\frac{a_j}{a_1 + a_2 + \dots + a_m}$.
- Then Rikka will press the Home button exactly once with the following effects:
 - Firstly, all the non-zero blocks will be shifted to the left as much as possible while keeping the relative order. For example, if the board is $\{0, x, y, 0, 0, z, 0, \dots\}$, it will become $\{x, y, z, 0, 0, 0, 0, \dots\}$.
 - Then, Rikka will check the board from column 1 to column $n - 1$ sequentially. If Rikka finds a column i such that blocks i and $i + 1$ have the same non-zero number, she will compute the sum of these two identical numbers, put it into block i , and reset the number in block $i + 1$ to 0. Also, she will add this sum to her score.
 - At last, all the non-zero blocks will again be shifted to the left as much as possible while keeping the relative order.
- If there are no more zero blocks, the game ends; otherwise, a new round begins, and Rikka will keep pressing the Home button once per round.

For example, if the board contains $\{0, 2, 0, 2, 0, 2, 1, 1, 0\}$ when Home is pressed, Rikka gets 6 points, and the sequence changes as follows:

$\{0, 2, 0, 2, 0, 2, 1, 1, 0\} \rightarrow \{2, 2, 2, 1, 1, 0, 0, 0, 0\} \rightarrow \{4, 0, 2, 2, 0, 0, 0, 0, 0\} \rightarrow \{4, 2, 2, 0, 0, 0, 0, 0, 0\}$.

Initially, Rikka has a score of 0. Rikka is curious about how many points she would expect to get if she played the game to the end according to the rules above. The answer may be very large if represented fully, so you only need to output the expected value modulo 998 244 353; see output format for the precise rules.

Input

The first line of input contains two integers n and m ($1 \leq n, m \leq 2000$).

The second line contains m integers, the i -th of which is a_i ($1 \leq a_i \leq 100$).

Output

Print a single line with a single integer: the expected score at the end of the game, taken modulo 998 244 353. It can be shown that the answer can be represented as $\frac{x}{y}$ where x and y are coprime non-negative integers. You should output the value $x \cdot y^{998\,244\,351} \bmod 998\,244\,353$.

Examples

standard input	standard output
2 2 1 1	2
10 6 19 2 6 8 1 7	5623384

Note

In the first example, Rikka has a probability of $\frac{1}{4}$ to get 4 points, $\frac{1}{8}$ to get 2 points, and $\frac{1}{8}$ to get 6 points. Also Rikka has a probability of $\frac{1}{2}$ to get a score of 0.