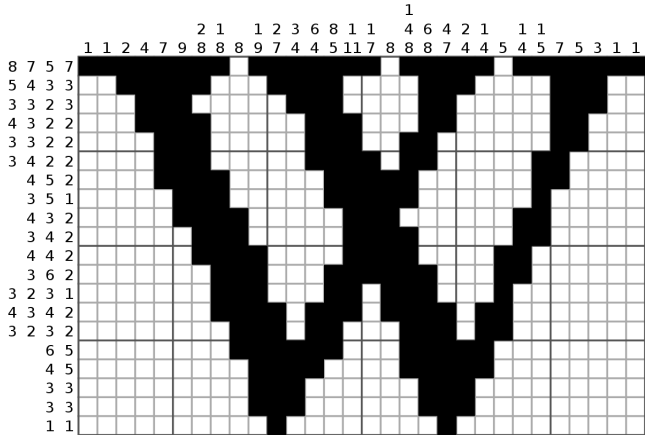
Brain teaser

Winter Workshops, Day 3, Available memory 512 MB *02.01.2020 - 08.01.2020*

There was some brain teaser called nonogram which you may or may not be familiar with. It looks like this:



In this problem we will consider a simplified nonogram N by M which can have $N \cdot M$ black cells. The rules are slightly different from a regular version of this brain teaser - in i–th row you need to color exactly A_i cells, and in the j–th column you need to color exactly B_j cells.

Given N, M and M values corresponding to the sequence A_i, output how many different sequences B_j are there such that the nonogram can be solved according to the rules. Since the result can be quite large, output it modulo $10^9 + 7$.

Constraints

- $1 \leq N, M \leq 40$
- $0 \leq A_i \leq N$
- All values in the input are integers.

Input

N M
a_1
a_2
:
a_M

Output

Print the number of different sequences B of length N which make the nonogram solvable, modulo 10^9+7.

Examples

Input	Output
4 2 1 3	13
10 10 3 1 4 1 5 9 2 6 5 3	281268070

Scoring

Don't waste your time on bruteforces for this problem, please.

Subtask	Constraints	Points
1	$N, M \leq 5$	10
2	$N, M \leq 10$	10
2	$N, M \leq 15$	10
2	$N, M \leq 20$	10
2	$N, M \leq 25$	10
2	$N, M \leq 30$	10
2	$N, M \leq 35$	10
2	$N, M \leq 40$	30