

CSE 4404-Algorithms Lab. Winter 2022

Date: March 28, 2023.

Target Group: A

Topic: Lab Test 2

Instructions:

- Task naming format: fullID_L02_T01_A.c/CPP
- Solutions with less efficient approaches will be considered for partial marks.

Task 1

Given n mixtures arranged in a row, each having a color represented by a number from 0 to 99, we need to find the minimum amount of smoke generated if we were to mix all the mixtures together. To do this, we can mix adjacent mixtures at each step and replace them with the resulting mixture until there is only one mixture left. When mixing two mixtures of colors a and b , the resulting mixture will have the color $(a + b) \bmod 100$, and the amount of smoke generated will be $a * b$.

Input

There will be a number of test cases in the input. The first line of each test case will contain n , the number of mixtures, $1 \leq n \leq 100$. The second line will contain n integers between 0 and 99 - the initial colors of the mixtures.

Output

For each test case, output the minimum amount of smoke.

Sample Input	Sample Output
2 18 19	342
3 40 60 20	2400

Task 2

There are N men and N women, both numbered from 1 to N . For each i, j ($1 \leq i, j \leq N$), the compatibility of Man i and Woman j is given as an integer $a_{i,j}$. If $a_{i,j} = 1$, then Man i and Woman j is compatible, else if $a_{i,j} = 0$, then Man i and Woman j is not compatible. You are trying to make N pairs, each consisting of a man and a woman who are compatible. Here, each man and each woman must belong to exactly one pair. Find the total number of different ways you can make N pairs, as this total number can be very big, output it by performing modulo $10^9 + 7$.

Input

The input starts with an integer N ($1 \leq N \leq 16$), the total number of men and women. Next, there will be a $(N \times N)$ compatibility matrix, where the j^{th} integer in the i^{th} line represents the value $a_{i,j}$.

Output

Output one integer containing the total number of ways you can make N pairs, modulo $10^9 + 7$.

Sample Input	Sample Output
3 0 1 1 1 0 1 1 1 1	3
4 0 1 0 0 0 0 0 1 1 0 0 0 0 0 1 0	1
1 0	0