

Elegia's Mind

Input file:	<i>standard input</i>
Output file:	<i>standard output</i>
Time limit:	6 seconds
Memory limit:	2048 mebibytes

The time and memory limits are quite strict.

There are n identical cubes, with each face painted in one of six different colors. Colors are numbered with integers from 0 to 5 inclusive. All the cubes are identical up to rotations in the three-dimensional space. Specifically, all cubes can be rotated in such a way that the front face is color 0, the top face is color 1, the right face is color 2, the left face is color 3, the bottom face is color 4, and the back face is color 5.

Suppose that we have arranged all these cubes in a line from left to right. Such an arrangement naturally produces the following six sequences of colors of length n : the colors on the front/top/right/left/bottom/back faces of the cubes, when viewed from left to right. How many ways are there to arrange the cubes so that all six said sequences are within the specified set of allowed sequences?

As the cubes are identical, it does not matter which cube is placed first in the sequence, which is placed second, and so on. Hence, there are 24^n arrangements in total: there are 24 ways to rotate each of the cubes. Of course, not all possible arrangements satisfy the condition on the colors of the faces.

The set of allowed sequences is given by an explicit string of 6^n characters “0” and “1”. The sequence (from left to right) of colors a_0, a_1, \dots, a_{n-1} (where each a_i is an integer between 0 and 5 inclusive) is allowed if and only if the $\sum_{i=0}^{n-1} (a_i \cdot 6^i)$ -th character (in 0-indexation) of the string is “1”.

Despite the fact that the answer to the problem is not very large, output it modulo the prime number 998 244 353.

Input

The first line contains an integer n ($1 \leq n \leq 9$), the number of cubes. The second line contains a string of 6^n characters “0” and “1”, with the k -th character (in 0-indexation) being “1” if and only if the base-6 notation of k is allowed when seen as a sequence of colors.

Output

One integer: the answer to the problem modulo 998 244 353.

Examples

[illegible]