Problem J. Dogs

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	256 mebibytes

In a village, there are n villagers labeled with $1, 2, \ldots, n$. Each villager keeps a dog, and the dog is either healthy or sick.

One day (denoted as day 0), a man comes to the village and tells **all the villagers** an unpleasant truth: there is **at least one sick dog** in the village.

On day t ($t \geq 1$), the each villager i inspects the dog of every villager j such that $G_{i,j} = 1$. All values $G_{i,j}$ are given in advance and known to **all the villagers**. For each dog inspected, the villager learns whether it is healthy or sick.

After all the inspections, if a villager can conclude that his own dog is sick, he shoots it in the afternoon. If more than one villager can reach such conclusion, they all shoot **simultaneously**. All villagers immediately hear the shots. After that, nobody does anything about dogs until the next day.

The villagers don't exchange information in any way except what is mentioned above.

- If any shooting occurs on day t, the above process ends with *shoot time* t.
- If $t < 233^n$, the process continues on day $(t + 1)$.
- Otherwise, the process ends with *shoot time* 0.

For each of the $(2^n - 1)$ possibilities of the health status of dogs, we record two values: the *shoot time* and how many dogs were shot. Find two sums: the sum of all recorded *shoot times* and the sum of the amounts of dogs shot. As both may be very large, find them modulo 998 244 353.

Input

The first line contains an integer n ($1 \leq n \leq 3000$).

The i-th of the following n lines contains n binary digits without spaces: $G_{i,1}, G_{i,2}, \ldots, G_{i,n}$ ($G_{i,j} \in \{0, 1\}$, $G_{i,i} = 0$).

Output

On the first line, print two integers: the sum of all recorded *shoot times* and the sum of the amounts of dogs shot, both modulo 998 244 353.

Examples

standard input	standard output
2 01 00	5 3
2 01 10	4 4

Note

For the first sample, there are three possible configurations:

1. Dog 1 is sick while dog 2 is not. Villager 1 finds no dogs other than his are sick, so he shoots his own dog on day 1.

2. Dog 2 is sick while dog 1 is not. On day 1, villager 1 is not sure about his dog, so he does nothing. On day 2, villager 2 knows his dog must be sick, or villager 1 would shoot his own dog on day 1.

3. Both dogs are sick. This case is similar to the second case.