Cross Matrix

You are given a $N * N$ matrix, U. You have to choose 2 sub-matrices A and B made of only 1s of U, such that, they have at least 1 cell in common, and each matrix is not completely engulfed by the other, i.e.,

If U is of the form

$$U = \begin{bmatrix} a_{0,0} & a_{0,1} & \dots & a_{0,N-2} & a_{0,N-1} \\ a_{1,0} & a_{1,1} & \dots & a_{1,N-2} & a_{2,N-1} \\ . & . & . & . & . \\ . & . & . & . & . \\ . & . & . & . & . \\ a_{N-1,0} & a_{N-1,1} & \dots & a_{N-1,N-2} & a_{N-1,N-1} \end{bmatrix}$$

and A is of the form

$$A = \begin{bmatrix} a_{x_1,y_1} & \dots & a_{x_1,y_2} \\ . & . & . \\ . & . & . \\ . & . & . \\ a_{x_2,y_1} & \dots & a_{x_2,y_2} \end{bmatrix}$$

and B is of the form

$$B = \begin{bmatrix} a_{x_3,y_3} & \dots & a_{x_3,y_4} \\ . & . & . \\ . & . & . \\ . & . & . \\ a_{x_4,y_3} & \dots & a_{x_4,y_4} \end{bmatrix}$$

then, there exists atleast 1 $a_{i,j}$: $a_{i,j} \in A$ and $a_{i,j} \in B$
then, there exists atleast 1 $a_{i1,j1}$: $a_{i1,j1} \in A$ and $a_{i1,j1} \notin B$
then, there exists atleast 1 $a_{i2,j2}$: $a_{i2,j2} \in B$ and $a_{i2,j2} \notin A$
$a_{x,y} = 1 \ \forall \ a_{x,y} \in A$
$a_{x,y} = 1 \ \forall \ a_{x,y} \in B$

How many such (A, B) exist?

Input Format
The first line of the input contains a number N.
N lines follow, each line containing N integers (0/1) **NOT** separated by any space.

Output Format
Output the total number of such (A, B) pairs. If the answer is greater than or equal to $10^9 + 7$, then print answer modulo (%) $10^9 + 7$.

Constraints

$2 \leq N \leq 1500$
$a_{i,j} \in [0, 1] : 0 \leq i, j \leq N - 1$

Sample Input

```
4
0010
0001
1010
1110
```

Sample Output

```
10
```

Explanation

X means the common part of A and B.
We can swap A and B to get another answer.

```
0010
0001
A010
XB10

0010
0001
A010
XBB0

0010
0001
10A0
1BX0

0010
0001
10A0
BBX0

0010
0001
1010
AXB0
```

TimeLimits

Time limit for this challenge is mentioned here