Tablets of Record

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4.5 seconds
Memory limit:	1024 megabytes

As time went on, the people began to preserve their civilization through records. On stone tablets, they etched numbers representing their villages, rituals, flows, and history.

But over the years, they found that some parts of these records were flawed. To restore the proper order, they set out to correct the errors.

Examine the records they left behind, and recover the lost flow of history.

The record is presented as an $N \times N$ grid. The cell at the r-th row from the top and c-th column from the left is denoted as (r, c). Each row represents an N-digit number, written from left to right, with one digit in each cell.

1	4	9	3	2
3	2	7	6	8
3	5	6	6	3
7	9	6	2	1
7	9	8	2	2

According to the intended structure, the values of the rows — when read as numbers from left to right — should strictly increase from top to bottom. However, due to errors in transcription, some digits may have been recorded incorrectly, and certain rows no longer follow this increasing order.

To correct the record, the people decided to erase some digits from the grid. Their goal is to ensure that the numbers formed by the remaining digits in each row (read from left to right) increase strictly from the top row to the bottom.

For example, consider the case illustrated below:

3	3	6	4	5
8	6	5	4	1
4	2	1	9	8
7	9	3	5	6
2	6	4	8	1

3	3			5
8		5	4	
	2	1	9	8
7		3	5	6
2	6	4	8	1

By erasing six digits as shown, the remaining numbers become $[335, 854, 2198, 7356, 26481]$. These values increase strictly from one row to the next, as intended.

Determine the minimum number of digits that must be erased.

Input

The first line contains a single integer N — the size of the tablet.

The following N lines each contain a string of N digits, $B_{i1}, B_{i2}, \cdots, B_{iN}$. B_{ij} is the digit recorded in cell (i, j).

- $2 \leq N \leq 2000$
- $1 \leq B_{ij} \leq 9$ $(1 \leq i, j \leq N)$

Output

Output the minimum number of digits that must be erased.

It is guaranteed that it is always possible to erase zero or more digits to satisfy the condition.

Scoring

- Subtask 1 (3 points): $B_{ij} = 1$ $(1 \leq i \leq N, 1 \leq j \leq N)$
- Subtask 2 (8 points): $N \leq 4$
- Subtask 3 (18 points): $N \leq 15$
- Subtask 4 (21 points): $N \leq 100$
- Subtask 5 (22 points): $N \leq 500$
- Subtask 6 (28 points): No additional constraints.

Examples

standard input	standard output
5 33645 86541 42198 79356 26481	6
3 111 111 111	3
8 19283746 85749285 56748236 17846565 77759471 85625624 41837461 23876597	13