

2.1 (2 pts)

2.1 The Cheapest Permutation

Input file: standard input
Output file: standard output
Time limit: 2 seconds
Memory limit: 512 megabytes

Let A be a symmetric $n \times n$ matrix of integers (symmetric means that $A[i][j] = A[j][i]$ for all $1 \leq i, j \leq n$). For a permutation π of integers from 1 to n , define its *cost* as

$$\sum_{i=1}^{n-1} A[\pi_i][\pi_{i+1}]$$

(hence, $A[i][j]$ can be viewed as the cost of placing integers i and j in adjacent positions). Your goal is to find a permutation of minimum cost.

Input

The first line contains an integer n ($1 \leq n \leq 9$). Each of the next n lines contains n integers $A[i][j]$ ($0 \leq A[i][j] \leq 1000$). It is guaranteed that $A[i][i] = 0$ for all $1 \leq i \leq n$ and $A[i][j] = A[j][i]$ for all $1 \leq i, j \leq n$.

Output

Output a permutation of minimum cost (integers from 1 to n in some order separated by spaces). In case of multiple correct answers output any of them.

Examples

standard input	standard output
3 0 1 2 1 0 4 2 4 0	2 1 3
4 0 1 1 1 1 0 1 1 1 1 0 1 1 1 1 0	1 2 3 4

2.2 (2 pts)

2.2 The King

Input file: `standard input`
Output file: `standard output`
Time limit: 2 seconds
Memory limit: 512 megabytes

Your goal is to solve the chess king puzzle. Recall that a chess king moves one square in any direction (horizontally, vertically, or diagonally). Your goal is to place as many king as possible on an $r \times c$ board subject to the following two conditions:

- There is at most one king in any cell of the board.
- Each king has at least one possible move into a free cell on the board.

Input

Two integers r and c ($1 \leq r, c \leq 100$) separated by spaces.

Output

The maximum number of kings.

Examples

standard input	standard output
1 2	1
3 3	8

2.3 (2 pts)

2.3 Sum of Minimums

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 512 megabytes

Let $A[1..n]$ be an array of integers. For $1 \leq l \leq r \leq n$, let

$$m(l, r) = \min\{A[l], A[l+1], \dots, A[r]\}$$

be the minimum value of A on an interval $[l, r]$. E.g., for $A = [3, 1, 2, 3]$, $m(1, 1) = 3$, $m(2, 2) = 1$, $m(3, 3) = 2$, $m(4, 4) = 3$, $m(1, 2) = 1$, $m(2, 3) = 1$, $m(3, 4) = 2$, $m(1, 3) = 1$, $m(2, 4) = 1$, and $m(1, 4) = 1$.

Given an array A , find the sum of minimums for all intervals (i.e., $\sum_{1 \leq l \leq r \leq n} m(l, r)$).

Input

The first line contains an integer n ($1 \leq n \leq 2000$), the length of the array. The second line contains integers $A[1], A[2], \dots, A[n]$ ($1 \leq A[i] \leq 1\,000\,000$, for all $1 \leq i \leq n$).

Output

The sum of minimums.

Example

standard input	standard output
4 3 1 2 3	16

2.4 (2 pts)

2.4 Expression Evaluation

Input file: **standard input**
Output file: **standard output**
Time limit: **2 seconds**
Memory limit: **512 megabytes**

Evaluate an arithmetic expression with only two types of arithmetic operations: addition and subtraction.

Input

The expression s to be evaluated, a non-empty string containing only digits and symbols of arithmetic operations + (plus) and - (minus). The length of s does not exceed 50 000.

It is guaranteed that the first symbol of s is a digit and each number in the expression is a non-negative integer with no more than six decimal digits.

Output

The evaluation result.

Examples

standard input	standard output
1+2+3+4	10
1-2+3-4	-2