

# All Pair Shortest Path

Input file:            standard input  
Output file:          standard output  
Time limit:          2 seconds  
Memory limit:        64 megabytes

Bobo had a directed graph  $G$  with  $n$  vertices conveniently labeled by  $1, 2, \dots, n$ . Let  $\delta(i, j)$  be the number of edges on the shortest path from vertex  $i$  to vertex  $j$  (If the shortest path does not exist,  $\delta(i, j) = n$ ).

Bobo would like to find  $\sum_{i=1}^n \sum_{j=1}^n \delta^2(i, j)$ .

## Input

The first line contains an integer  $n$  ( $1 \leq n \leq 2000$ ).

The  $i$ -th of the following  $n$  lines contains  $n$  integers  $g_{i,1}, g_{i,2}, \dots, g_{i,n}$  ( $0 \leq g_{i,j} \leq 1$ ). If there is an edge from vertex  $i$  to vertex  $j$ , then  $g_{i,j} = 1$ . Otherwise,  $g_{i,j} = 0$ .

## Output

An integer denotes  $\sum_{i=1}^n \sum_{j=1}^n \delta^2(i, j)$ .

## Examples

| standard input         | standard output |
|------------------------|-----------------|
| 3<br>010<br>001<br>100 | 15              |
| 2<br>10<br>01          | 8               |