

# Sum of Median

You are given  $n$  increasing sequences  $A_1, A_2, A_3, \dots, A_n$ . Each sequence have  $L$  values of integers.

Merge  $A_i$  and  $A_j$  obtained  $A_{ij}$  have  $2L$  values and  $A_{ij}$  is increasing sequence. Median values of  $A_{ij}$  is  $L$ -th value of  $A_{ij}$ .

Example:

$L = 5$ .

$A_i = (1\ 3\ 4\ 5\ 6)$ ;  $A_j = (0\ 1\ 5\ 6\ 7)$ .

$A_{ij} = (0\ 1\ 1\ 3\ 4\ 5\ 5\ 6\ 6\ 7)$ .

Median value of  $A_{ij}$  is 4.

## Input

- The first line of input contains  $n, L$  ( $2 \leq n \leq 200$ ;  $1 \leq L \leq 20000$ ).

- In the next  $n$  lines, the  $i$ -th line contains  $L$  integers of  $\leq 10^9$   $A_i$ .

## Output

- Sum of all median value in module  $10^9$ .

## Example

**Input:**

3 6

1 2 3 4 5 6

3 4 5 6 7 8

0 0 1 1 2 2

**Output:**

8