

# Wall Breaking

Problem Code	hw06a_wall
Running Time Limit	1 sec
Memory Limit	16 mb

## Objective

- Be able to compute shortest distance

## Introduction

Assume that we are in a large room that is partitioned into a grid of  $N \times M$  cells. Cells are labeled with coordinate 0 to  $N - 1$  from north to south and 0 to  $M - 1$  from west to east. Cells are partitioned by walls of varying thickness. Let us say that now we are at cell  $(0,0)$  and we wish to go to cell  $(N - 1, M - 1)$ . To go to adjacent cell, we have to break the wall dividing these cells. Once, we are in the target cell, we can then move to other cell by breaking another wall. The cost to break each wall is directly proportioned to the thickness of the wall. Be noted that, the wall that bound the room is unbreakable, i.e., you can only break the wall between cells, not the wall that bound the cell and the area outside the room.

Your task is to find the least summation of wall thickness to create a path from cell  $(0,0)$  to cell  $(N - 1, M - 1)$ .

Following figure shows example of a room divided into  $4 \times 5$  cells. The number next to each internal segment is the thickness of the wall. The least total thickness is 9.

	8	4	3	2				
<u>1</u>	<u>1</u>	4	<u>1</u>	3	<u>1</u>	4	2	7
8	8	6	4	9	<u>1</u>	<u>1</u>	9	9
2	8	9	3	<u>1</u>	<u>1</u>	9	1	9

## Task

Assume that we know thickness of each wall, your task is to compute the least total thickness of wall needed to be broken.

## Input

The first line of input contains two numbers  $N$  and  $M$  ( $1 \leq N, M \leq 100$ ). This is followed by  $2N - 1$  lines that give the thickness of each wall. Lines of wall thickness are given alternatively between that of north-south wall and west-east wall. For these  $2N - 1$  wall thickness lines, each of the odd lines (the first, third, fifth, seventh, ...) contains  $M - 1$  numbers that denote the thickness of north-south walls. Each of the even line (second, fourth, sixth, ...) contains  $M$  numbers that denote the thickness of west-east walls. Please see the Example 1 for the input of the room shown above.

## Output

The output is one number describing the least total wall thickness needed to be broken.

## Example

### Ex1

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