# Fall 2020 ECE30017 Problem Solving through Computational Thinking

# Week 3

C2. Ski Trail

Deadline: 11:59 PM, 18 Septeber (Fri)

• P3. Carriers

Deadline: 4:00 PM, 21 Septeber (Mon)

# C2. Ski Trail

KOC (Korea Olympic Committee) plans to build a ski resort on the mountains of Pyeongchang. To design ski trails, the KOC engineers modeled the shape of the mountain as a  $n \times n$  grid of cells where each cell represents a region of the mountain and the value at the cell represents the altitude of the region.

In this model, a ski trail is represented as a sequence of cells,  $(s_1, s_2, ..., s_n)$ , where the following two conditions hold:

- 1.  $s_i$  and  $s_{i+1}$  are adjacent cells in the mountain model.
- 2. The altitude of  $s_i$  is higher than that of  $s_{i+1}$ .

To challenge ski players, KOC wants to build a ski trail of which the difficulty is as high as possible. The difficulty of the ski trail is determined as the sum of the altitude differences between two adjacent cells.

Write a program that finds the highest value of difficulty among all possible trails for a given mountain model.

# Requirements

### Input data

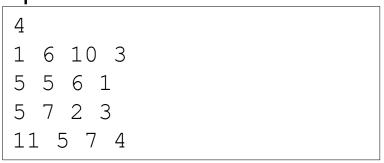
- The first line from the standard input has one integer n, which represents that the size of the model is  $n \times n$  for  $1 \le n \le 500$ .
- From the second to the n + 1-th lines, the model of the mountain is given. Each line has n positive integers. The j-th value of the i + 1-th line is the altitude at the (i, j) cell. An altitude is an integer between 0 to  $10^8$ .

### Output data

- Print out one integer, that is, the highest value of ski trail difficulty to the standard output within 0.5 second.

## **Example**

### input



#### output



# Teams for C2

- Team members must work together for writing a report
  - scores on report and presentation will be shared
  - peer evaluation will be followed
- Each member must construct a solution program individually
  - Team members must not share their program code

Team 201	강하영		전해주		
Team 202	김기훈		신희주		
Team 203	김석진		한찬솔		
Team 204	김승우		정희석		
Team 205	김유진		윤지영		
Team 206	김윤정		이예준		
Team 207	김준서		정원식		
Team 208	김지원		임예찬		
Team 209	박민준		송수근		
Team 210	박수현		지성민		
Team 211	송진범		홍원표		
Team 212	윤다은		최재혁		
Team 213	정예은		한정섭		
Team 214	정진혁		홍석현		
Team 215	정현섭 초		우석	황소정	

# P3. Carriers

You have N shopping backs from a shopping mall, whose weights are  $w_1, w_2, ..., w_N$ . The weight of a shopping back is no more than M.

To bring these home, you are hiring carriers. A carrier can carry one shopping back by default. And a carrier can carry one more shopping back if the sum of the weights of the two shopping backs is no more than M.

Write a program that finds the minimal number of carriers that can carry all given shopping backs

# Requirements

### Input

The input data is given to the standard input. The first line has a positive integer M, the maximum weight of a shopping back. After that, an arbitrary number of lines follow, each of which contains a weight of a shopping back.

### **Output**

Print out the minimum number of carriers to the standard output.

### **Example**

Input file

5		
1		
3		
3 5		
5		

Output file

3			