Lab: Multidimensional Lists

Problems for in-class lab for the Python Advanced Course @SoftUni. Submit your solutions in the SoftUni judge system at https://judge.softuni.bg/Contests/1834

1. Sum Matrix Elements

Write program that **reads a matrix** from the console and print:

- Sum of all **matrix elements**
- The **matrix itself**

On first line you will get matrix sizes in format **"{rows}, {columns}"**

Examples

Input	Output
3, 6 7, 1, 3, 3, 2, 1 1, 3, 9, 8, 5, 6 4, 6, 7, 9, 1, 0	76 [[7, 1, 3, 3, 2, 1], [1, 3, 9, 8, 5, 6], [4, 6, 7, 9, 1, 0]]

2. Sum Matrix Columns

Write program that **read a matrix** from console and print the sum for each column. On first line you will get matrix **rows**. On the next **rows** lines, you will get elements for each column separated with a space.

Examples

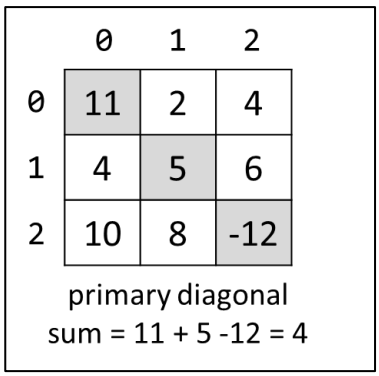
Input	Output
3, 6 7 1 3 3 2 1 1 3 9 8 5 6 4 6 7 9 1 0	12 10 19 20 8 7
3, 3 1 2 3 4 5 6 7 8 9	12 15 18

Hints

- **Read** matrix **sizes**.
- On the next row lines **read** the **columns**.
- **Traverse** the matrix and **sum** all elements in **each** column.
- Print the **sum** and **continue** with the other columns.

3. Primary Diagonal

Write a program that finds the **sum of matrix primary diagonal**.



Input

- On the **first line**, you are given the integer **N** – the size of the square matrix
- The next **N lines** holds the values for **every row** – **N** numbers separated by a space

Examples

Input	Output
3 11 2 4 4 5 6 10 8 -12	4
3 1 2 3 4 5 6 7 8 9	15

4. Symbol in Matrix

Write a program that reads **N**, number representing **rows** and **cols** of a **matrix**. On the next **N** lines, you will receive rows of the matrix. Each row consists of ASCII characters. After that, you will receive a symbol. Find the **first occurrence** of that symbol in the matrix and print its position in the format: "**`({row}, {col})`**". If there is no such symbol print an error message "**`{symbol} does not occur in the matrix`**"

Examples

Input	Output
3 ABC DEF X!@ !	(2, 1)
4 asdd xczc qwee	4 does not occur in the matrix

qefw 4	

5. Square with Maximum Sum

Write a program that **read a matrix** from console. Then find biggest sum of **2x2 submatrix** and print it to console.

Input

On first line you will get matrix sizes in format **rows, columns.**

One next **rows** lines you will get elements for each **column** separated with coma.

Output

Print **biggest top-left** square, which you find and sum of its elements.

Examples

Input	Output
3, 6 7, 1, 3, 3, 2, 1 1, 3, 9, 8, 5, 6 4, 6, 7, 9, 1, 0	9 8 7 9 33
2, 4 10, 11, 12, 13 14, 15, 16, 17	12 13 16 17 58

Hints

- Be aware of **`IndexError`**
- If you find more than one max square, print the top-left one