Assignment 1: 2d arrays

1. For an n*n matrix diagonal elements are given. All non-diagonal elements are equal, say x. Find out the minimum value of x such that the sum of diagonal elements is less than the sum of nondiagonal elements.

Input:

5 10 4 7

Output:

5 3 3 3

3 10 3 3

3 3 4 3

3 3 3 7

(Hint: Sum of diagonal element: 26, sum of other elements: 36)

2. In a matrix, calculate the sum of all neighboring elements of each diagonal element (up, down, left, right, and 4 diagonal elements -- a total of 8 elements). Print these values corresponding to each diagonal element. Also print the index of that diagonal element whose corresponding sum is highest.

Input:

3 2 0 4 1 10 4 -2 0 3 7 0 8

5

5 6 1 4 4 7 0 -1 3

Output:

3: 13

10: 20

7: 25

4: 22

3: 7

index: 2

3. Take a matrix of size m*n. Find out its transpose using a function transpose(arr, &m, &n).

Input:

2 3

1 1 1

2 2 2

Output:

1 2

1 2

1 2

- 4. Read a square matrix of size n. Do the following tasks:
 - a. Print all unique values along each row.
 - b. Print all unique values along each column.
 - c. Print all unique values in the matrix.

Input:

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4
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- 5 1 2 1
- 4 10 3 5
- 2 1 4 4
- 1 2 0 7

Output:

Along rows:

- 1 2 5
- 3 4 5 10
- 1 2 4
- 0 1 2 7

Along columns:

- 1 2 4 5
- 1 2 10
- 0 2 3 4
- 14 5 7

Matrix:
0 1 2 3 4 5 7 10

- 5. Create an array of employee names.
 - a. Arrange them in lexicographically sorted order
 - b. Print all unique names

Input:

8

Ram Mohan Shyam Amit Kritika Ram Mohit Amit

Output:

Sorted:

Amit Amit Kritika Mohan Mohit Ram Ram Shyam

Unique:

Amit Kritika Mohan Mohit Ram Shyam

6. Enter a square matrix and print the the i^{th} row and j^{th} column whose sums are equal.

Input:

- 4
- 1 1 1 5
- 1 1 1 0
- 2 2 2 1
- 3 3 3 2

Output:

Row: 1

Column: 4

7. Check whether given strings are palindrome.

Input:

4

sos

abc

hello

abba

Output:

yes

no

no

yes

8. For an n*n matrix diagonal elements are given. Find if the matrix is such that diagonal element is equal to the sum of its neighboring (up/down/right/left only) elements.

Input:

5 3 2 0 4 5 1 10 4 -2 6 3 7 -1 0 8 5 5 6 1 4

2 -1

4

Output:

7

yes

9