

Lab Task Week 14

Note:

- Copied task will be awarded **zero** marks.
- Note that these lab task marks could be graded through a viva in lab.

Problem: 1 | 2d Array

Write a C Program to Find the Transpose of a Matrix.

The program takes a matrix and prints the transpose of the matrix. In a transpose matrix, rows become columns and vice versa. Your program should find the transpose for matrix of any dimensions. See the screenshot below and your output and formatting must be like the following. Proper and user-friendly!

```
How many rows? 2
How many cols? 4
Enter value for index 00: 1
Enter value for index 01: 2
Enter value for index 02: 3
Enter value for index 03: 4

Enter value for index 10: 5
Enter value for index 11: 6
Enter value for index 12: 7
Enter value for index 13: 8

Original Matrix:
1 2 3 4
5 6 7 8

Transpose of Matrix:
1 5
2 6
3 7
4 8
```

Problem: 2 | 2d Array

Write a program which use will enter a square matrix (equal no of rows and cols) with specified size and your program will find the sum of left and right diagonal. Your output formatting must be clear and user-friendly like the following screenshot

Expected Output :

```
Enter the dimension of square matrix: 3
Enter value for index 00: 1
Enter value for index 01: 2
Enter value for index 02: 5

Enter value for index 10: 2
Enter value for index 11: 6
Enter value for index 12: 8

Enter value for index 20: 5
Enter value for index 21: 6
Enter value for index 22: 7

Original Matrix:
1  2  5
2  6  8
5  6  7

Sum of left Diagonal: 14

Sum of right Diagonal: 16
```

Problem: 3 | 2d Array

Write a program in which user will enter the quarterly sales revenue of the company for 3 years. And stores in 2D array. In each row the quarterly sales will be stored for a specific year. Below is a pictorial representation for your understanding. Your task is to find the total sales per year and the total sales for all the 4 years. Finally output the max sales that achieved in a particular quarter of the year.

Year 1	Q1	Q2	Q3	Q4
Year 2	Q1	Q2	Q3	Q4
Year 3	Q1	Q2	Q3	Q4
Year 4	Q1	Q2	Q3	Q4

```

Year 1:
Enter sales for Quarter: 1
2000
Enter sales for Quarter: 2
4000
Enter sales for Quarter: 3
1000
Enter sales for Quarter: 4
4000

Year 2:
Enter sales for Quarter: 1
6000
Enter sales for Quarter: 2
2000
Enter sales for Quarter: 3
4000
Enter sales for Quarter: 4
2000

Year 3:
Enter sales for Quarter: 1
1000
Enter sales for Quarter: 2
5000
Enter sales for Quarter: 3
2000
Enter sales for Quarter: 4
50000

Year: 1 revenue: 11000
Year: 2 revenue: 14000
Year: 3 revenue: 58000

Max Sales: 50000 in Year 3 Quarter 4

```

Problem: 4 | 2d Array

Write a C Program to Perform Matrix Multiplication.

1. The program takes two matrices and multiplies them
2. If number of columns of matrix A is not equal to number of rows of matrix B, then matrices cannot be added.
3. The program is exited.
4. Else they are multiplied and the result is printed.
5. In output, print the first matrix, second matrix and the resultant matrix.

Note: When you want to print the array, pass that array to a function and the function will print the array.