CC-112L

Programming Fundamentals
Laboratory 11
Introduction to Programming, Algorithms and C

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Department of Information Technology University of the Punjab
Lahore, Pakistan

Pre Lab Tasks:

Task 1

Task 2

Task 3

Task 4

Task 5

Resources Required:

Desktop Computer or Laptop

Microsoft ® Visual Studio 2022

Teachers:

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Task 01: **10 marks**

Write a program to find the transpose of a 2D matrix. The transpose of a matrix is obtained by flipping it over its diagonal , rows become columns and columns become rows.

Example:

Input:

1 2 3
4 5 6

Output:
1 4
2 5
3 6

Task 01: **10 marks**

Write a program to find the largest element in a given 2D matrix.

Example:

Input:
3 8 2
4 6 9

Output: Largest element = 9

Task 03: **10 marks**

Write a program to calculate and print the sum of elements of each row in a 2D matrix

Example:

Input:

1 2 3
4 5 6
7 8 9

Output:
Row 1 sum = 6
Row 2 sum = 15
Row 3 sum = 24

Task 04: 10 marks

Write a program to reverse the elements in each row of a 2D matrix.

Example:

Input:
1 2 3
4 5 6

Output:
3 2 1
6 5 4

Task 05: 10 marks

You are checking a student's OMR answer sheet. The sheet is represented as a 5x4 matrix, where each row represents a question (Q1 to Q5). Each column represents an option (A, B, C, D). A cell contains 1 → if the student selected that option and 0 → if the option was not selected.

Your Task is to Write a program that reads a 5x4 matrix. For each question (row), check, exactly one option is marked (i.e., one 1). If all rows are correctly marked → print Valid OMR Sheet. If any row has No option marked (all 0s) **OR** More than one option marked → print Invalid OMR Sheet.

Sample Output 1:

0 0 1 0

1 0 0 0

0 0 1 0

Sample Output 2:

0 0 0 0

0 1 1 0

0 1 0 0

1 0 0 0

0 0 1 0

Result: Valid OMR Sheet

0 0 1 0

0 1 0 0

Result: Invalid OMR Sheet