National University of Computer and Emerging Sciences, Lahore Campus

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	Lab No 8			
	Course Name:	**Programming Fundamentals**	**Course Code:**	**CS 188**
	Program:	**BS(SE)**	**Semester:**	**Fall 2020**
	Duration:	**2.5 hours**	**Total Points:**	**20 + 10 + 20**
	Lab Date:	**Saturday, November 28, 2020**	**Weight**	**3%**
	Section:	**SE-1A and SE-1B**	**Page(s):**	

Instruction/Notes: **Cheating during the lab will result in negative marks**

Topics Covered: Loops and 2D Array

Us a text editor to create the program and use the g++ compiler to compile your program using the already installed MinGW compiler toolchain or use the MinGW copied into your network derive. **NO ONLINE TOOLS TO BE USED IN THIS LAB ONWARDS**

Problem [FLIP ARRAY] [10x4 Points]

A 2D array can be flipped horizontally, vertically, along the diagonals as shown in the examples below. In this task you are required to write 4 different C++ programs each performing each one of the flip for a globally declared array of size at most 10 by 10.

Flip Type	Input Matrix	After flip
Vertical	0 1 2 3 4 5 6 7 8 9 10 11	3 2 1 0 7 6 5 4 11 10 9 8
Horizontal	1 2 3 4 0 1 2 3 4 5 6 7 8 9 10 11	8 9 10 11 4 5 6 7 0 1 2 3 1 2 3 4
Diagonal(main)	0 1 2 3 4 5 6 7 8 9 10 11	10 11 7 3 9 5 6 2 8 4 0 1
Diagonal	1 2 3 4 0 1 2 3 4 5 6 7 8 9 10 11	1 0 4 8 2 1 5 9 3 2 6 10 4 3 7 11

Your program must ask the user to enter the number of rows and number of columns in the array, where each of these values must be less than 10, and then take input in the array and store the result of the flip in a second array and then display the arrays after performing the required flip.