**National University of Computer and Emerging Sciences, Lahore Campus**

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|  | **Course:** | **OOP Lab** | **Course Code:** | **CL1004** |
| **Program:** | **BS (Computer Science)** | **Semester:** | **Spring 2023** | |
| **Duration:** | **1 Hour** | **Total Marks:** | **30** |
| **Paper Date:** | **21st March, 2023** | **Weight:** |  |
| **Section:** | **BCS-2H** | **Page(s):** | **2** |
| **Exam:** | **Lab Midterm** | **Reg. No.** |  |

**Read below Instructions Carefully:**

* Understanding the question statement is also part of the exam, so do not ask for any clarification. In case of any ambiguity, make suitable assumptions.
* You have to complete exam in 2 hrs. No extra time will be given for submission.
* Submit a single **.cpp file** for each question named as **21L-1122 (Q#)**
* Submit folder on **cactus** by following path: \\cactus1\ Xeon\ Spring 2023\ Fariha Maqbool\ BCS-2H\ Mid\YourSection
* Your code should be **intended** and **commented** properly. Use **meaningful variable names**.
* It is your responsibility to save your code from being copied. All matching codes will be considered cheating cases. **PLAGIARISM** will result in forwarding of **case to Disciplinary Committee** and **negative marks** in Midterm.

**Question:**

Design a class **Matrix** which contains following data members:

1. A pointer to a 2D integer array
2. Integer variables to store the rows and columns of matrix

Write following functions:

1. **Default Constructor:** Initialize the values of rows and columns to zero and assign Null to pointer variable
2. **void AllocateMemory( ):** that takes size of a **char** matrix (rows and columns) from user, allocates memory for the matrix
3. **void InputMatrix( ):** which inputs the data from console and store the values in the matrix
4. **void DisplayMatrix( ):** that displays the matrix in proper format
5. **void removeFromMatrix(const char rchar, char\*\* matrix2)** to copy the given matrix to another matrix (**matrix2**) with all **rows** and **columns** containing the occurrence of a given character removed. The rows and columns at the end should be filled with ‘-‘.

**Example:**

In the following example, **Matrix2** is formed from **Matrix1** when input character is ‘a’**.**  All the rows and columns which contains character ‘a’ have been removed in the new matrix.

