National University of Computer and Emerging Sciences, Lahore Campus

Course:	OOP LAB	Course Code:	CL1004
Program:	BSCS	Semester:	Spring 2022
Duration:	2 hours	Total Marks:	100
Paper Date:	13-April-2022	Weight	%
Section:	2K	Page(s):	3
Exam:	Midterm	Roll 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. Remaining time will be used for submission.
- For Q1, submit a single file (containing classes definitions and main) named as 21L-1122-Q1.cpp.
- For Q2, submit a single file (containing definitions and main) named as 21L-1122-Q2.cpp.
- Submission path: \\cactus1\Xeon\Spring 2022\Hira Ilyas\OOP Mid\2K
- Submit both questions .cpp file on Google Classroom under assignment titled as **OOP- Lab Mid Exam Submission. (Don't create zip file)**
- 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 No. 1

TASK 1:
Write a function **char** AllocateMemory(int& rows, int& cols)** that takes size of matrix (rows and columns) from the user , allocates memory for the matrix and return its pointer.

TASK 2:
Write a function **void InputMatrix(char** matrix, const int rows, const int cols)** which initializes the matrix by user input.

TASK 3:
Write a function **void DisplayMatrix(char** matrix, const int& rows, const int& cols)** that displays the matrix in proper format.

TASK 4:
Write a function **bool isAllDiagonal(char** matrix, const int& rows, const int& cols)** that returns true if every diagonal element has the same values in the matrix else false.

For Example:

Input =

Output= True
Note: For isAllDiagonal the matrix should be square.

TASK 5:
Write a function **void rotateAntiClockWise(char** matrix, const int& rows, const int& cols)** that rotates the matrix in anticlockwise direction only if the matrix has all the diagonal values same.
For Example:
Input =

Output=

Question No. 02:

Define a class to represent a **Bank account**. Include the following members. Data members:-
Name of the depositor
Account number.
Type of account.
Balance amount in the account.

Provide a **default constructor**, a **parameterized constructor** and a **copy constructor** to this class.

Also provide Member Functions:-
1. To deposit an amount.
2. To withdraw the amount after checking for minimum balance.
3. To display all the details of an account holder.

Illustrate all the constructors as well as all the methods by defining objects.
In the main function, **dynamically allocate** an array of Bank Account objects. Your program should ask the user about the size of the array and then allocate the array dynamically. Then, your program should ask the user to enter the values of all attributes (Name of the depositor Account number, Type of account, Balance amount in the account) for each Bank Account. After that, your program should display the total number of Bank Account details as well as the details of each object on screen (by calling the display function for each Bank Account Object).