

National University of Computer and Emerging Sciences



Lab Manual
for
Object Oriented Programming

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| Section | OOP BSCS-2J |
| Semester | Spring 2022 |

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Objectives:

After performing this lab, students shall be able to:

- ✓ Dynamic 2D arrays, allocation and deallocation.
- ✓ Classes, getters, setters and constructors

Problem 1

Write a function called `rotateOuterLayerBy1`, which takes a 2 dimensional square matrix and its dimension, `n`, as parameters and rotate the outermost layer by one place, anti-clockwise. Use 2D pointers to create and access the two dimensional array.

Constraint: Your code cannot create an extra array to accomplish the given task. But you can create one or two extra integers.

Example:

Example:

A 4x4 array

| | | | |
|----|----|----|----|
| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 |

Outer layer rotated once

| | | | |
|---|----|----|----|
| 1 | 2 | 3 | 7 |
| 0 | 5 | 6 | 11 |
| 4 | 9 | 10 | 15 |
| 8 | 12 | 13 | 14 |

Problem 2

Create a class named 'Rectangle' with two data members- length and breadth and a function to calculate the area which is 'length*breadth'. The class has three constructors which are :

- 1 - having no parameter - values of both length and breadth are assigned zero.
- 2 - having two numbers as parameters - the two numbers are assigned as length and breadth respectively.
- 3 - having one number as parameter - both length and breadth are assigned that number.

Now, create objects of the 'Rectangle' class having none, one and two parameters and print their areas.