**National University of Computer and Emerging Sciences**



**Laboratory Manual**

*for*

**Object Oriented Programing Lab**

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**Objectives:**

In this lab, students will practice:

1. Classes basic
2. Getter, Setter, Constructor, Copy Constructor

# Exercise- **Circle class:**

Design a class **Circle** with private attributes **radius** and **area**. Calculate the **area** of the circle using a member function.

# Exercise- **Output:**

Run the code given and write output:

| #include<iostream>  #include<string>  using namespace std;  class GradeBook  {  public:  void setCourseName(string name )  {  courseName = name;  } // end function setCourseName  string getCourseName() const  {  return courseName;  } // end function getCourseName  void displayMessage() const  {  cout << "Welcome to the grade book for\n" << << "!" << endl;  } // end function displayMessage  private:  string courseName;  }; // end class GradeBook  int main()  {  string nameOfCourse;  GradeBook myGradeBook;  cout << "Initial course name is: “<< endl;  cout << "\nPlease enter the course name:" << endl;  getline(cin, nameOfCourse );  myGradeBook.setCourseName(nameOfCourse);  cout << endl;  myGradeBook.displayMessage();  } // end main |
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# Exercise- **Student class:**

Create a class **Student** with private attributes **StudentId**, **name**, **grade**, and **GPA**. Provide getter and setter methods for each attribute. Also, write a constructor to initialize the **Student** details.

Example output:

| Student ID: 101  Name: John Doe  Grade: A  GPA: 3.75  Updated Details:  Grade: B  GPA: 3.5 |
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# Exercise- **Product class:**

Create a class **Product** with private attributes **productId**, **productName**, and **price**. Implement getter and setter methods for each attribute. Write a constructor to set the initial values of the product details. Also, include a copy constructor to create a copy of a Product object.

Example output:

| Product ID: 1001  Product Name: Laptop  Price: $1200.5  Copied Product Details:  Product ID: 1001  Product Name: Laptop  Price: $1200.5 |
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# Exercise- **Bank Management System:**

Implement a class **BankAccount** to manage bank account details. Include private attributes such as **accountNumber**, **accountHolderName**, and **balance**. Provide getter and setter methods for each attribute. Also, write a constructor to initialize the account details and a copy constructor to duplicate a bank account object.