Aror University of Art, Architecture, Design & Heritage Sukkur.

Department of Artificial Intelligence and Multimedia Gaming

Object Oriented Programming(Spring-2024)

LAB No. 5

Prepared by: Abdul Haseeb Shaikh

Objective of Lab No. 5:
After performing lab5, students will be able to:

- Implement Polymorphism in java using Method Overloading
- Implement constructor overloading
- Implement Encapsulation in java

Lab Exercises:

1. **Create a class called Circle with a private instance variable radius.**
    a. **Provide public getter and setter methods for radius, but ensure that the setter method validates that the radius is always positive.**
    b. **Create objects of Circle class and show the usage of setter and getter methods.**

2. **Create a class called BankAccount with private instance variables accountNumber and balance.**
    a. Ensure that accountNumber is a read-only variable and balance can be accessed and modified using getter and setter methods.
    b. Create two objects of this class, if the user does not provide any information during creation of the object, then make accountNumber as -1 and let balance remain 0, but if the user provides complete information then set the accountNumber and balance with the information provided by user.

3. **Create a class called Employee with private instance variables id, name, and salary. Make this class as a read-only class**

    a. Include a method called raiseSalary that takes a double amount as a parameter and increases the salary by that amount. Ensure that the raiseSalary method cannot be accessed from outside the class.
    b. Create objects of this class to show it's functionality.

4. Create a class called StringUtils with overloaded methods: to concatenate two strings, concatenate three strings, and concatenate an array of strings. The methods should return the concatenated string.

5. Create a class called DateUtils with overloaded methods to format a date in three different ways (e.g., dd/mm/yyyy, mm/dd/yyyy, yyyy/mm/dd). The methods should return the formatted date as a string.

6. Create a class called MathUtils with overloaded methods to calculate the square root of an integer, double, and float. The methods should return the square root.