

HomeWork-3: Decorator Pattern Implementation

(CLO-2)

BSSE-2023 (A & B)

Dr. Muhammad Asif

Software Design and Architecture

SE203-T (Spring-25)

Information Technology University (ITU) – Lahore

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Marks/Question=10

Objective:

Students will implement the Decorator Pattern in Java/C# to understand how to dynamically add functionalities to objects without modifying their structure. This will help them grasp the concept of flexible and reusable code design.

Task: Implementation

Each student must implement the **Decorator Pattern** based on the example discussed in class. The implementation should include:

1. **Component Interface**
 - Defines the base behavior that concrete components and decorators will extend.
2. **Concrete Component Class**
 - Implements the component interface and provides the basic functionality.
3. **Abstract Decorator Class**
 - Implements the component interface and holds a reference to a component object.
4. **Concrete Decorators**
 - Extend the abstract decorator and add new functionalities dynamically.
5. **Client Class**
 - Demonstrates the **Decorator Pattern** in action by dynamically adding functionalities to objects.

Ensure that:

- The implementation should follow the Decorator Design Pattern principles.
- The class names, method names, and structure match what was explained in the lecture.
- The implementation is correctly commented, explaining each part of the code.
- Ensure proper encapsulation and separation of concerns between decorator and components.

Late Submission Policy:

Late submissions will be evaluated at half marks. Please adhere to the deadline to avoid a reduction in your grade.

Submission:

- Submit the completed documentation by **28-February-2025**.
- Be prepared for a potential **viva** on the submitted documentation.
- Submit the source code in a ZIP file containing:
 - The complete implementation
 - A README file explaining the execution steps
- Ensure that the code follows proper naming conventions and best practices.
- Late submissions will be deducted 50% of marks as per the course policy.