OO Design Patterns Lab

Semester V Course Code BCGL504

CIE Marks 50 Teaching Hours/Week (L:T:P: S) 0:0:2:0

SEE Marks 50 Credits 01 Exam Hours 100

Examination type (SEE) Practical

Course objectives:

● To introduce students to the fundamental principles and concepts of design patterns and their role in object-oriented software development.

● To equip students with the skills to identify and apply the most appropriate design patterns to solve common software design problems.

● To develop the ability to analyze the advantages and disadvantages of different design patterns in real-world applications.

● To provide hands-on experience in implementing various design patterns using object-oriented programming languages.

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| Sl.NO | Experiments (Implementation using Star UML |  |
| 1 | Design and implement ShapeFactory class that generates different types of Shape objects (Circle, Square, Rectangle) based on input parameters using Factory Design Pattern. |  |
| 2 | Design and Implement an AbstractFactory class to create families of related or dependent objects with respect to decathlon store without specifying their concrete classes using Abstract Factory |  |
| 3 | 3 Design and implement a complex object like a House using a step-by-step Builder pattern, allowing different representations of the house (wooden, brick, etc.). |  |
| 4 | 4 Design and Implement to Extend a Coffee object with dynamic features (e.g., milk, sugar, whipped cream) using Decorators |  |
| 5 | 5 Design and Implement a Logger class ensuring a single instance throughout the application |  |
| 6 | 6 Design and implement an Adapter Pattern for a Music System |  |
| 7 | 7 Design and Implement an Observer pattern for a news agency to notify subscribers of updates. |  |
| 8 | 8 Design and Implement a Façade pattern for home theatre system |  |
| 9 | 9 Design and Implement a Template Method for Document Processing (word, pdf, excel) |  |
| 10 | 10 Design and Implement weather monitoring system that notifies multiple display devices whenever the weather conditions change that follows the Observer Design Pattern |  |
| 11 | ..... 11 Design and Implement a Proxy pattern to control access to an object (e.g., a protected resource or remote service). |  |
| 12 | 212 Design and Implement a Mediator pattern to manage communication between a set of objects (e.g., chat room with multiple participants). |  |

Course outcomes (Course Skill Set): At the end of the course the student will be able to:

● Design the model for the given problem using UML concepts and notations.

● Develop the solution for the given real world problem using design patterns .

● Analyze the results and produce substantial written documentation.