

Course: SE 506 Design Patterns
Lab 09: Decorator & Strategy Design Pattern
Time: 2 hours

1. Imagine a coffee shop where you can customize your coffee order. You start with a basic coffee, and you can add different ingredients like milk, sugar, whipped cream, and so on. The base coffee object can be decorated with additional functionality (flavors, toppings) dynamically. For example, you can start with a plain coffee object, then wrap it with a milk decorator, followed by a sugar decorator, and finally a whipped cream decorator. Each decorator adds new features or modifies the behavior of the coffee object.

Design and implement the above scenario using the Decorator design pattern.

2. Let's consider an application used to simulate and study the interaction between robots. A robot can exhibit different behaviours such as aggressive, defensive, normal, etc. based on information provided by sensors, such as position, nearby obstacles, and other environmental factors. The robot maintains its context information, such as position and nearby obstacles.

In the main section of the application, multiple robots and behaviors are created. Each robot is assigned a unique behavior. Over time, the assigned behaviors of the robots can be changed dynamically.