OOADP Assignment

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Q16) Beverages coffee and tea are prepared using common steps viz. Boil water, add grains, add condiments and serve. But the implementation of each step differs. Design a system to take care of such a situation where predefined steps are followed but implementation varies using template method pattern. Write a Java program to implement the solution after designing a class diagram solution.
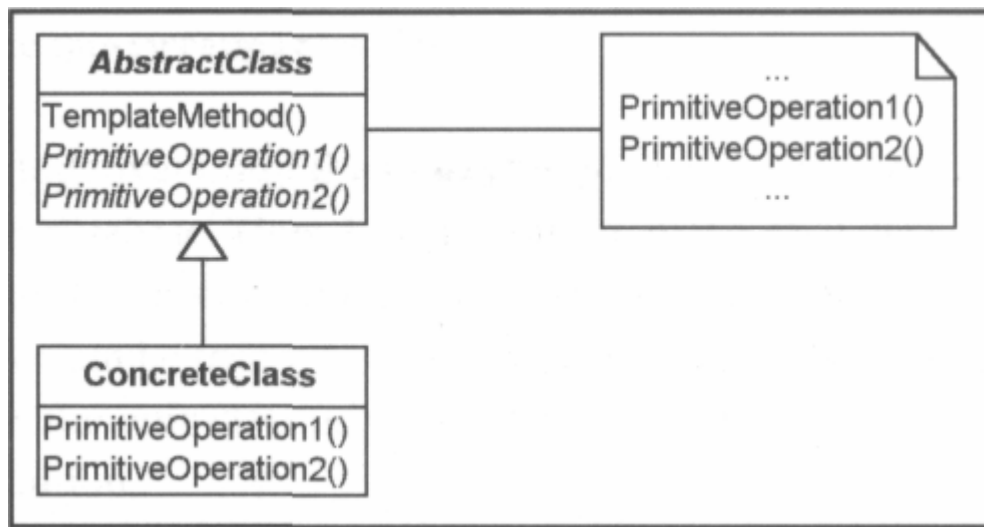
Soln:
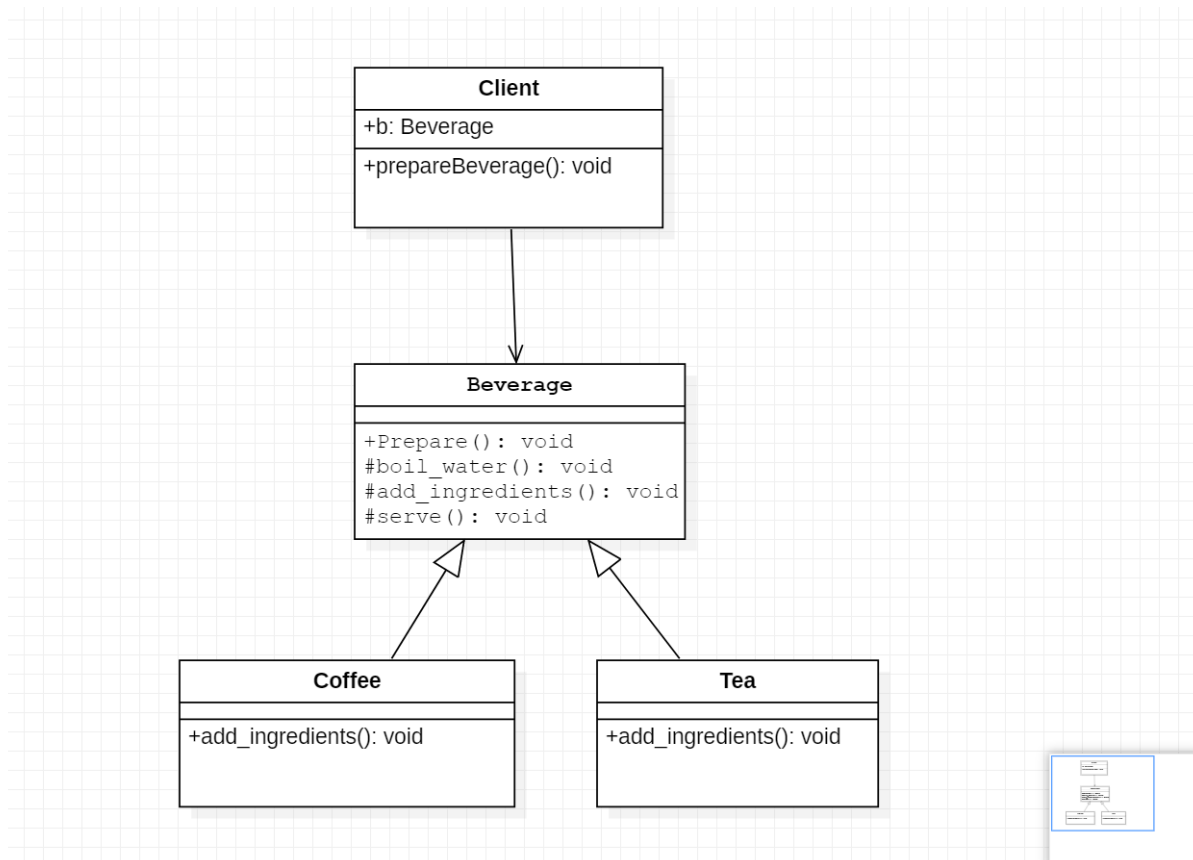> The suitable design pattern is **Template Method Design Pattern.**

Key Features of Template method design pattern:

- **Intent**: Define the skeleton of an algorithm in an operation, deferring some steps to subclasses. Redefine the steps in an algorithm without changing the algorithm's structure.

- **Problem**: There is a procedure or set of steps to follow that is consistent at one level of detail, but individual steps may have different implementations at a lower level of detail.

- **Solution**: Allows for definition of substeps that vary while maintaining a consistent basic process.

- **Participants and Collaborators**: The template method consists of an abstract class that defines the basic Template Method classes that need to be overridden. Each concrete class derived from the abstract class implements a new method for the template.

- **Consequences**: Template provides a good platform for code reuse. They also are helpful in ensuring the required steps are implemented. They bind the overridden steps together for each concrete class, and so should only be used when these variations always and only occur together.

- **Implementation**: Create an abstract class that implements a procedure using abstract methods. These abstract methods must be implemented in subclasses to perform each step of the procedure. If the steps vary independently, each step may be implemented with a strategy pattern.

Generic Structure of the Template Method Design Pattern.

Class Diagram on StarUML

OUTPUT

```
Enter choice of beverage:
1.Coffee.
2.Tea
1
Preparing Beverage...
BOILING WATER
Adding ingredients required for COFFEE
Adding Sugar
Adding COFFEE BEANS
Adding WATER
Adding MILK
SERVING BEVERAGE COFFEE
```