Design Patterns Foundation Assignment

By Raj Vignesh Karunakaran

1. **Chain of Responsibility Design Pattern:**

   Chain of Responsibility is a type of behavioral design pattern that is used when a request is needed to be handled by a chain of objects. Each object can decide if the request can be moved higher in the chain or drop it.

   - Chain of responsibility for forms a loosely coupled connection between sender of the request and receiver since it allows the request to be handled by multiple objects.
   - The receiver object is chained and the request is passed along the chain until one of the object handles the request.
   - The set of request handler objects and the order in which they form a chain can be decided dynamically at runtime depending on the state of the application.

   Chain Diagram for Chain of Responsibility:
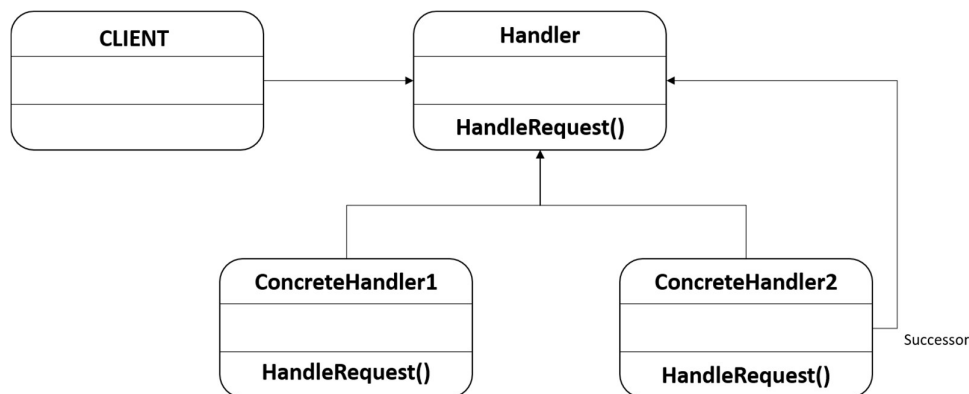
   Handler: The role of the handler is to define an interface for handling the request from the client. It is also responsible for implementing successor link.

   ConcreteHandler: The concrete handler handles the request it is responsible for, if it can. Else the request is forwarded to its successor.

   Client: Client initiates the request to a Handler object on the chain.

Scenario for Chain of responsibility: Requestion of Loan from a Bank.

In this scenario, If a person is interested in getting a loan from a bank, the person (client) need to approach the bank and provide the necessary documents to the bank. Once the documents are valid, It will be forward to an official who can then authorize to approve the loan. Depending on the type of loan/the size of the loan. The approver's role in the bank may vary. If the loan is a small amount it can be authorized be even a low-level manager. Whereas if the amount is higher, the power of authority can vary. This exhibits a scenario where chain of responsibility can be utilized.

Class diagram for the scenario:
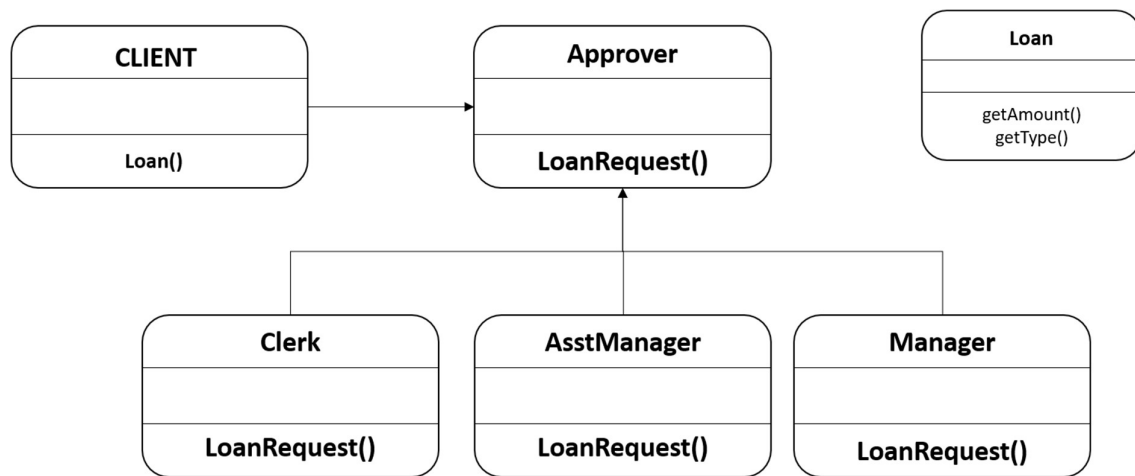
2. Java Class examples for Prototype

Output:


```
Original prototype Laptop class: G14 Ryzen 9 16 GB 512 GB RGB
Cloned Laptop class 1: G14 Ryzen 9 24 GB 1 TB RGB
Cloned Laptop class 2: G14 Ryzen 7 16 GB 512 GB NO RGB

Process finished with exit code 0
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