**Credit Card Problem**

**Student Name:** Raviteja Gannarapu

**Student ID:** 016650972

**Design patterns:**

* Chain of Responsibility.
* Factory method.

1. **Describe what is the primary problem you try to solve.**

* **Determining credit card number** is the primary problem. Each credit card has its own specific criteria. Though current problem lists only a few credit card types, design should support any number of credit cards.

1. **Describe what are the secondary problems you try to solve (if there are any).**

* Application should **accept multiple file formats**. It should support multiple file parsers or handlers. And they are determined on runtime.

1. **Describe what design pattern(s) you use how (use plain text and diagrams).**

* Application is implemented using **Chain of Responsibility** Behavioral pattern and **Factory method** creational design pattern.
* Primary problem of determining credit card type is tackled with Chain of Responsibility.
* Created abstract class CreditCard with subclasses of different credit cards like MasterCC, VisaCC, AmExCC and DiscoverCC. While CreditCard acts as Handler with link to successor CreditCard.
* Each subclass overrides a Handler method getCardType to define their own criteria using which creditcard type is determined.
* CreditCard class has a method link to define chain of objects.
* For the secondary problem, Factory method is implemented. Interface FileHandler is created which declares methods to read from and write to files. Similarly, there exists a filehandler for each file format. A filehandler is determined based on input and output file’s extension and factory method is used to create handler class object.

**Class Diagram:**

Diagram

Description automatically generated

1. **Describe the consequences of using this/these pattern(s).**

* Using these patterns, application can be easily updated to supports any number of different credit cards.
* Also, newer file formats can be easily added.
* Since each credit card defines its own characteristics, defining identity becomes its own responsibility.