Individual Project Parts 2 & 3

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In continuation of Part 1, Template Method pattern and Factory pattern are used to complete the design of detecting the credit card type from an input file.

Since there is a definite sequence of steps involved in performing the above operations, the Template Method pattern is used to define the algorithm. It has the following steps:

1. Open input file and return the file object.
2. Parse input file and return a list of card numbers.
3. Validate card number for each card number in the list.
4. Generate an output file with the card number, card type and error, if any.

Additionally, the template class also has subclasses that parse and write to output files based on file type.

This is where the Factory pattern comes into picture; it creates the respective file operator object based on the file extension.

Validation is taken care of by a chain of validators (Chain of Responsibility pattern) as described in Part 1. Once the card number is validated, the corresponding subclass for the file creates the output file in accordance with the file name provided initially.

This design can be extended to accommodate new validators and new file operators if a new card type, or a new file type were to be added. Also, the Client is free to define the chain for validating a request. So, any changes to the chain order are also handled.

The below class diagram represents the entire design of credit card validation with file processing.