**CMPE 202 – INDIVIDUAL PROJECT**

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**PART 1 + CLASS DIAGRAMS**

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

Based on the given requirements, I found that the primary problem is as following:

* Check whether the credit card details are valid or not based on the different types of credit cards available (Master Card, Visa, American Express, Discover).
* To validate the type of credit card based on the given requirements like the credit card number length, should be fixed number or 12 or 14 digits.

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

* The secondary problem I tried to solve is to identify the proper design pattern to support the addition of new credit class for the different types of credit cards in future.

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

I choose **Factory design pattern**, because this design pattern creates objects based on the type of input.

* The client sends the input file that contains credit card details and expects the creation of a particular kind of input file.
* A new **RecordIO** object is created. Based on the type of file name specified by the client, an appropriate **\_filetype\_RecordIO** object is created in the RecordIOFactory.
* In the specific \_filetype\_RecordIO subclasses (JsonRecordIO, CsvRecordIO, XmlRecordIO) there is a logic to read the card details in different types of the input file and write the expected output to that specified output file. A new credit card object of that particular type is created in the **CreditCardFactory** class.
* In the subclasses, different types of credit cards are created based on the inputs. (DiscoverCC, MasterCC, VisaCC, AmExCC).
* Each output is created in the specified output file is created using OutputRecord class.

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

* Factory Design pattern helps in the creation of the object while removing the logic behind the creation.
* By using this pattern there is a chance of adding more subclasses to support new object types in the future.
* Ensures that there is a loose coupling because of the separation of logic and responsibilities among different subclasses. This facilitates modification and addition of subclasses that may be required in the future.
* One drawback of this approach is that the abstraction makes the code challenging to read and understand.

**Class diagram of credit card object instantiation.**

**Diagram

Description automatically generated**

**Class diagram of entire Application**

**Diagram

Description automatically generated**