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| Course | Advanced Software Design – CS525 |
| Assignment | Lab 1 |
| Week | 01 |
| Due | Feb 17, 2020 |
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**Problem 1**:

Problem 1 is the question a from the PDF file.

**Answer**:

There’re many ways to design the rental application. I started from the Rental information.

To have the Rental information, we will need:

* The information relating to customer, which can be grouped into an object.
* Period of the rental like start, end dates and the max duration, into an object.
* Vehicle information, which has few information like:
  + Vehicle type (or body), it can be a list like SUV, Truck, Convertible, …
  + Vehicle detail like VIN, make, model, …
  + How many vehicle for rental, how many left in the inventory, for this purpose, we will store with total number
  + It can be a case that one customer can rent multiple vehicle at the same time in the same rental.
* For reservation, we will need the customer information, which can be used for the rental later. Also, we will need the reservation date, the vehicle type, make, model, but those are not mandatory.

A close up of a logo

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**Problem 2**:

Problem 2 is the combination of question b, c, and d.

**Answer**:

Like the problem 1, I start the design from certain points:

* Shopping cart:
  + It has Customer data, and the customer data is formed as an object CustomerInfo.
  + List of items to purchase, which has its ID, book items and quantity, the date of added into the list
  + Some other information such as date of shopping, total amount, shipping type (like standard, express)
* Customer information: we can reuse the design from problem 1
* I added here an interface Item, which is used for other certain types for expandability like adding e-book, videos, CDs, …
* Of course, Book object is our point here.
* After all, these processed information will be stored in the database for storing and future purposes, like Books, CustomerInfo, and ShoppingCart.

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For the sequence of adding an item into an existing shopping cart, we can see few steps could be involved:

* ***searchBook()*** on the UserUI, that will retrieve the results from database (this part I skip, because it’s a DAO operation).
* Then we will add the found books to the item list via ***addBookToItemList()***
* Once we have the item list, we will retrieve the shopping cart from the cache or database based on the **customerId** via ***retrieveCartByCustomerId()*** function call.
* Then we will add the item list into the cart with ***addSelectedItemListToCart()*** with addedList, and shoppingCart.
* Once the cart is fill and we can finalize the cart, place the order, then the data will be stored into database.
* Then the UserUI will show the order/shoppingcart is placed.

So the sequence diagram based on the above steps can be drawn as below.

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