Submission report - Lab 4: Implementing a design based on inheritance

24292-Object Oriented Programming

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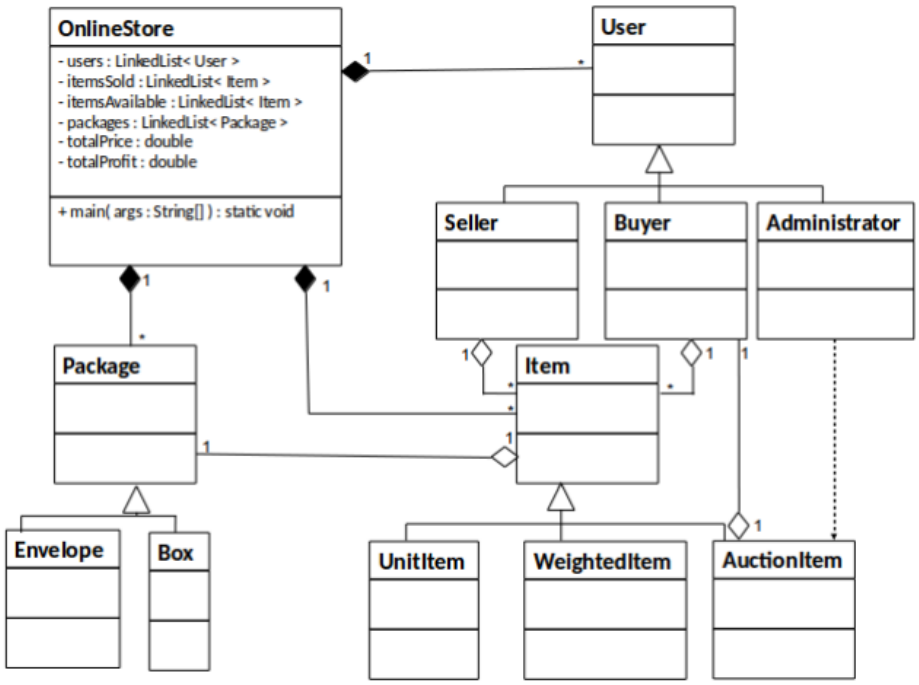
Introduction:

The aim of this lab session is to implement the design of Seminar 3 that partially models an online store. The project uses 3 super classes Item, User and Package. Each super class have its sub classes. Item has for subclasses Unit Item, Auction Item and Weighted Item. User has Administrator, Seller and Buyer. Package have Box and Envelope.



Item class:

In item class we define the items that we are going to sell in our online store. In this class we declare the item's name, type, size and cost. We also have method that calculated the best packaged based on the size of the item, which we want to buy.

Then we have the three types of items:
UnitItem: extension of Item but we add 2 more attributes unitPrice and quantity. This class have methods getPrice, CalculateProfit and Sell.

WeightedItem: extension of item with 2 more attributes PricePerWeight and Weight. Here we have the same methods as in UnitItem.

AuctionItem : extension of item with 3 additional attributes current price, Bidder and Deadline. Here we have the same methods as the previous two subclasses plus makeBid, Frozen , getBuyer and get Deadline Methods.

User Class:

In User call we define the type of users that we are going to have in our online store. In the class we declare the user's name, ID and password. We have getters and setters methods and login method. User class have 3 sub classes – Administrator, Buyer and Seller.

Administrator: extension of User class, we add list of users as attributes. Here we have method expel user, Manage Action and printStock. We also add linked list of users to the constructor of administrator since we have method expel user, and to be able to manipulate the list of users.

Seller: extension of User class, we add in attributes accountName, list of sold items, list of available items and deposit. As methods, we have sell item, AddAvailabeItem, and deposit and the constructor method. We also add linked lists of sold and available items to the constructor of seller so that the seller can manipulate the lists (AddAvailableItem and sell methods, need to update the lists of sold and available items)

Buyer: extension of User class, we add in attributes accountName, list of bought items and deposit. As methods, we

have buy and pay, and the constructor method. We also add to the constructor the linked list of bought items, so that we can manipulate the list of bought items (with the function Buy)

Package class:

In Package class we define the type of packages that we are going to have in our online store. In the class we declare the package's width and height as attributes. We have getters and setters methods and the constructor method. We also have 2 subclasses Box and Envelope.

Box: extension of Package with extra attribute depth. Here we have constructor method and isSuitable method, which calculates if the item we want to pack is suitable for box.

Envelope: extension of Package with extra attribute name. Here we have constructor method and isSuitable method, which calculates if the item we want to pack is suitable for envelope.

Lastly we have the class MainOnlineStore, where we have as attributes linked lists of available items, packages, users, sold items and bought items, totalPrice and total Profit with initial values 0. We also have the Main Function in this class, where we execute our program. Inside the main we have added some sample items and users to check whether our methods work.

Conclusion:

The theoretical concepts of object-oriented programming that we applied as part of the solution are: the application of

fundamental concepts of classes, instances, methods and attributes, also visibility, the keyword this, and how to define relations between different classes, inheritance, polymorphism and abstract classes.

Overall, we managed to do everything without any problems. We used various websites like GeeksforGeeks or Stackoverflow to check methods and implementations of methods, how to use inheritance and etc. We also spent a lot of time testing weather everything was working. Something that occurred as an obstacle was that we did not know how to make functions like “sell” in the subclass Seller, because at first, we created in the constructor linked lists soldItems and availableItems as = new lists, which was our mistake. It took us some time to understand that we had to actually declare the list in main and afterwards put it as parameter in the constructor of sell. With that we fixed the other classes and methods, and the program finally started without problems.