Mid-Module Assignment: System Design

Class list

* Customer:

Essential part of the system for whom it is created.

* Staff:

The system’s operators and the ones who manage transactions and products.

* Product:

The third essential part, the customer’s object of interest.

* Loyalty Card:

Class associated with customer but that communicates also with payment class, every customer has his own fidelity card.

* Basket:

Another class associate to customer, every customer has his own basket and it communicates with payment system to provide the products list.

* Payment:
* Cash
* Card
* Apple pay
* Google pay
* Fidelity points

Class used for customer checkout, with multiple sub classes.

* Stock:

Subclass of the class Product, with strong relationship, communicates with another system.

Classes relationships

The customer class is the main class, it has an association relationship with product, a customer can select a product, scan it or weigh it and add it to his virtual basket or remove it at any time, one customer can select many products. Customer has an association relationship with basket, a customer populates the basket and is its owner and there is one basket for every customer, it can be considered a one-way association. Customers can possess loyalty cards but are not required to and can have only one, this translates in a one-to-one association, without its customer a card has no meaning to exist, but it is not a strong connection such as a composition. Customers are also associated to payments; a customer can perform many payments considering that the customer may want to split the bill or make multiple transactions.

Staff class is the second most important class of the system, the one that makes it work. Staff has a one-way association relationship with payments where they can override and control them. A member of the staff can control many payments. Staff is also one-way associated to customers, in the sense that they can check customer’s age for restricted items, one staff can check many customers.

Payment class has a set of subclasses, payment methods, that are related through composition, because they are a building part of the payment system. Payment has also a relationship with stock, where a completed payment or transaction updates the stock status, it is a one-way association with one transaction being able to update many stock records.

The basket class has an association with the payment class, it provides the amount to pay to the payment system and the product list to update the stock class.

Product class ha a composition relationship with basket class being an indispensable part of a basket.

The loyalty card class communicates to the payment system through association to provide the loyalty points record when a customer scans it.

Lastly the stock class is part of the product class through the composition relationship, given the fact that the stock, without a product to refer to, doesn’t exist, so it can be considered a strong relationship.

Diagram

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