

# Mid-Module Assignment: System Design

## Classes

Class	Explanation
Customer	Customer class needs to be included as they are the main actor (and end user) interacting with the system.
Loyalty Card	Customers who have loyalty cards can scan the card when purchasing items and collect points.
Item	Item class is our main class and covers all the articles in our system which are listed for sale.
Virtual Shopping Basket	When a customer selects items, they need to be sent into a virtual basket (like a shopping cart), so that they can later be purchased.
Purchase Methods	Our system provides customers with different purchasing methods, so that they can make a purchase using the most suitable option for them.
Cash	These classes are subclasses of the Purchase Methods class. They are the available payment methods for our customers.
ApplePay	
AndroidPay	
Voucher	
Loyalty Points	
Payment Transaction	This class covers the actual payment made by the customer to purchase the items.
Supermarket Staff	This class represents the supermarket staff which can override a transaction if a customer's age is restricted to buy the chosen item.
Supermarket Control Class	This class is updated after every completed transaction and alerts the warehouse staff which needs to update the stock and the shelves.
Warehouse Staff	Warehouse Staff are alerted by the Supermarket Control Class about the shelves and stock updates.
Shelf	This class represents the shelves in the market, which hold/contain the stock, i.e. the items.
Stock	Represents the collection of items available for sale.

## Relationships between classes

Relationship	Classes	Reasoning
Association	Customer and Item	Customer scans items to be purchased.
Composition	Customer and Virtual Shopping Basket	A customer has a virtual shopping basket, but it is only created when a customer scans item(s) to be bought.
Aggregation	Virtual Shopping Basket and Item	Items can exist without the virtual shopping basket created.
Aggregation	Stock and Item	Items can exist without the stock, but the stock contains the items.
Aggregation	Stock and Shelf	Stock can exist without the shelf, but a shelf contains stock to be kept and displayed in the shop.
Dependency	Stock and Supermarket Stock Control	Whenever the stock is re-ordered, the supermarket stock control will be aware about it.
Dependency	Shelf and Supermarket Stock Control	Whenever the shelves are replenished, the supermarket stock control will be aware about it.
Aggregation	Customer and Loyalty Card	If a customer has a loyalty card, they can scan it to pay for items and collect points.
Association	Supermarket Staff and Customer	Supermarket staff checks the customer age for buying restricted items.
Association	Supermarket Staff and Payment Transaction	Supermarket staff can override the transaction paid by the customer.
Dependency Association	Payment Transaction and Supermarket Stock Control	Payment transactions will update the records in the Supermarket Stock Control class.
Dependency Association	Supermarket Stock Control and Warehouse Staff	Warehouse staff will be alerted by the Supermarket Stock Control Class for stock re-ordering and shelf replenishment.
Association	Customer and Purchase Methods	Customer buys items using one of these methods.
Inheritance / Generalization	Cash, ApplePay, AndroidPay, Voucher, Loyalty Points and Purchase Methods	These payment methods are the same, meaning they inherit the purchase methods class.

