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Design Project 2

The task presented with this design was to create a program which would allow producers, suppliers, and consumers to interact with each other. The producer will "grow" some type of produce, and notify the supplier with what type of produce was grown as well as the quantity which was grown. The supplier will buy some amount of the produce grown and then notify the consumer what kind of produce it has and how much it has in its supply. The consumer will then buy a random amount of produce up to the maximum quantity the supplier has. The produce has several properties such as freshness (fresh, ripe, spoiled), if it's organic, and if it is GMO. The consumers in this system can be picky, only wanting to buy produce with certain combinations of these traits.

To allow the correct interaction between the producer, supplier, and consumer the observer patter was used. One class and an interface built into the java.util library, Observable and Observer respectively, were used to facilitate this design pattern. The observable class provides methods which notify any observers and add new observers. When the notify observer function is used in the observable, any observers will update and receive the updated information from the observable. This is the fundamental interaction which causes this system to operate. The Producer, Supplier, and Consumer classes all extend the Observable class and both Supplier and Consumer implement the interface Observer. The supplier observes the producer, and the consumer observes the supplier. The supplier also observes the consumer, which allows the consumer to let the supplier know the quantity of produce it would like to buy.

To create the produce which is being sold in this system the decorator pattern was used. A base class Produce was created member variables which keep track of its freshness and organic status. Two classes inherit this base class, fruit and vegetable. A produce decorator is also created to decorate a fruit or vegetable with its type (i.e. Carrot, banana). To set values for freshness, organic and gmo the setter methods of produce must be used.