

1. Functional Specifications for Shopping Cart Application

The Shopping Cart application allows users to create a customer account, log in, and browse a list of products. Products can be added to the shopping cart with a specified quantity and the Customer can proceed to checkout at any time. Sellers can log in to the application and add new products, update inventory, and review sales data.

Application Features

The application must provide the following features and functionality:

- 1) User can login with a username and password.
 - When a Customer logs in, an inventory view displays where s/he can browse through a list of available products that includes the product name, price, and available quantity.
 - When a Seller logs in, an inventory management view displays where the current state of the inventory is shown.
- 2) Any user can create a new Customer account at any time. Seller accounts will be built into the system for authorized users.
- 3) Customer can select products from the inventory list and add them to their shopping cart, including quantity (that is, more than one of a certain product can be added) depending on availability.
- 4) Shopping cart total amount is kept current on the main product browse window.
- 5) Customer can click on a product and get the full product description in a pop-up window, including pricing and current available quantity.
- 6) Customer can proceed to checkout at any time. At checkout the customer verifies the shopping cart content and pays for the goods by supplying the credit card. The application does not arrange for shipping.
- 7) Customer can update shopping cart contents at any time, changing the quantity of an item or removing an item.
- 8) Seller can add new products to inventory. Product information includes:
 - product name
 - product type
 - invoice price
 - sell price
 - available quantity
 - product ID
- 9) Seller can modify an existing product in the inventory, including quantity and price.
- 10) Application keeps track of all costs, revenues, and profits. The seller can access this persistent information from the application UI.
- 11) Application is required to maintain a persistent inventory between executions.

12) Application is required to maintain a persistent database of Customer and Seller accounts for login verification purposes.

13) The internal product representation must include:

- ID
- name
- type
- quantity
- invoice price
- selling price

Application Architecture:

The Shopping Cart application will be implemented using the Java Swing GUI and packaged as an executable JAR file.

User Interface:

The Shopping Cart Application will use a GUI composed of the following menus/views:

- 1) Login View
 - Fields to enter existing username and password
 - "Login" button and "Create Account" button
- 2) Create Account View
 - Fields to enter desired username and password
 - "Create" button
- 3) Customer Inventory View
 - List of products currently in the inventory
 - "Add to Cart" and "View Details" buttons on each listed item
 - Dropdown menu for each listed item to select quantity
 - Icon displaying current shopping cart amount
 - "Logout" button
- 4) Checkout View
 - List of products currently in the shopping cart and price of each item
 - Total price of all shopping cart items
 - Dropdown menu on each listed item to select a new quantity
 - "Update Cart" button to confirm quantity modifications and "Complete Order" button
- 5) Inventory Management View
 - List of current products in inventory
 - "Edit" button for each listed item

- "Add New Item" button and "Review Sales Data" button
- 6) Add/Edit Product View
 - Fields to enter/edit product name, type, quantity, invoice price, selling price
 - "Save" button
- 7) Sales Data View
 - Display of total costs, revenue and profit
 - "Inventory Management" button to return to inventory management view

Use Cases:

1. Create Account

- a) Customer opens application.
- b) Application shows LoginView.
- c) Customer clicks "Create Account" button, which notifies CreateAccountView.
- d) Application shows CreateAccountView.
- e) Customer inputs desired username and password and clicks "Create Account" button.
- f) Account creates the new account, saves it to the accounts database, logs the Customer into their new account, and notifies CustomerInventoryView.
- g) Application shows CustomerInventoryView.

1. Create Account (Variation #1)

- a) Start at Step e.
- b) Account attempts to create the new account, but fails due to invalid/duplicate username and notifies CreateAccountView.
- c) CreateAccountView updates and displays a message stating the Customer entered an invalid/duplicate username.

2. Log In

- a) Customer opens application.
- b) Application shows LoginView.
- c) Customer enters username and password in appropriate text fields and clicks "Login" button.

- d) Account logs the Customer into their account and then notifies CustomerInventoryView.
- e) Application shows CustomerInventoryView.

2. Log In (Variation #1)

- a) Start at Step b.
- b) Seller enters username and password for a Seller-type account and clicks "Login" button.
- c) Account logs the Seller into their account and then notifies InventoryManagementView.
- d) Applications shows InventoryManagementView.

2. Log In (Variation #2)

- a) In step 2.c, user entered wrong username or password.
- b) Account notifies LoginView.
- c) LoginView updates to display the message "Account not found."
- d) Customer tries again, or creates a new account (Use Case 1).

3. Review Product Details

- a) Customer carries out **Log In**.
- b) Customer clicks on desired item's "View Details" button.
- c) Product notifies CustomerInventoryView.
- d) CustomerInventoryView updates to display a previously-hidden panel showing the item's name and selling price, and a drop-down menu to choose a quantity and an "Add to Cart" button.

4. Add Product to Shopping Cart

- a) Customer carries out **Log In**.
- b) Customer browses through product list.
- c) Customer chooses quantity of a listed product from a drop-down list (default is set to 1) and clicks "Add to Cart" on desired product.

- d) ShoppingCart adds the product to its list with the chosen quantity value, asks Inventory to update its quantity (subtracts from inventory however many Customer added to cart), and notifies CustomerInventoryView.
- e) CustomerInventoryView updates to show the new shopping cart total.

4. Add Product to Shopping Cart (Variation #1)

- a) Customer carries out **Review Product Details**
- b) From the product details panel, the Customer chooses quantity from a drop-down list (default is set to 1) and clicks “Add to Cart” on desired product.
- c) Continue from step d.

5. Review/Update Shopping Cart

- a) Customer carries out **Add Item to Shopping Cart**
- b) Customer clicks on “Checkout” from the actions toolbar
- c) ShoppingCart notifies CheckoutView.
- d) Application displays CheckoutView.
- e) Customer changes the quantity of the desired item and clicks the “Update Cart” button.
- f) ShoppingCart updates the quantity of that item in its list, asks Inventory to update its quantity, and notifies CheckoutView.
- g) CheckoutView updates to show the changes made to the shopping cart contents.

6. Checkout

- a) Customer carries out **Add Item to Shopping Cart**.
- b) Customer clicks on “Checkout” button, which notifies CheckoutView.
- c) Application displays CheckoutView.
- d) Customer verifies items and enters credit card information.
- e) The customer clicks “Complete Order” button, which asks ShoppingCart to send total amount and credit card information to PaymentProcessor, where card info is verified and the order is processed.

- f) ShoppingCart saves the details of the order to the sales database, and then notifies CheckoutView.
- g) CheckoutView updates to display an order confirmation.

6. Checkout (Variation #1)

- a) Start at Step c
- b) Customer clicks "Cancel" button
- c) Order is not processed and ShoppingCart notifies CustomerInventoryView. Shopping cart contents remain the same.
- d) Application displays CustomerInventoryView.

7. Seller Reviews/Updates Inventory

- a) Seller carries out **Log In (Variation #1)**
- b) Seller clicks "Edit" button on desired product from inventory management page, which notifies Edit/AddProductView.
- c) Application displays Edit/AddProductView with fields filled in with current product information.
- d) Seller edits desired information (Name, Type, Invoice Price, Selling Price, Quantity).
- e) Seller clicks "Save" button, which asks Inventory to update the product with the new information, and then notifies InventoryManagementView.
- f) Application displays InventoryManagementView.

8. Seller Adds New Product

- a) Seller carries out **Log In (Variation #1)**
- b) Seller clicks on "Add New Product" button from product management page, which notifies Edit/AddProductView.
- c) Application displays Edit/AddProductView, with all fields blank.
- d) Seller enters product details: Name, Type, Invoice Price, Selling Price, Quantity. Application generates product ID automatically to avoid duplication.

- e) Seller clicks “Save” button, which asks Product to create the new product, then Inventory to add the new product with the given details, and then notify InventoryManagementView.
- f) Application displays InventoryManagementView.

9. Seller Reviews Costs/Revenue/Profit

- a) Seller carries out **Log In (Variation #1)**
- b) Seller clicks on “Review Sales Data” button from InventoryManagementView, which asks Inventory to retrieve all sales data from the sales database.
- c) Application displays SalesDataView, which features a table showing:
 - Costs (Sum of invoice price for all items bought by Customers)
 - Revenue (Sum of sale price for all sold items by Customers)
 - Profit (Difference between Revenues and Cost)

Glossary:

User: Anyone enacting one of the specified use cases of the application.

Customer: Type of user who interacts with the application to browse or purchase available products; can create a new account with the application at any time.

Seller: Type of user who interacts with the system to update inventory, add new products, or review sales data; Seller-type account creation is prohibited.

Product List: A list displayed to Customers made up of all the items currently available in the inventory; Customers can browse this list and add products from it to their shopping cart for purchase.

Shopping Cart: A collection of products tied to a Customer's account that holds any product the Customer has chosen to purchase; can be updated by the Customer to add or remove products.

Sales Data: Information about all transactions made through the application that a Seller can review; includes total costs, total revenue, and total profit.

GUI: Graphical User Interface through which a user interacts with the application.

View: Specific versions of the GUI for the specific use cases defined for the application.

2. Design Specifications for Shopping Cart Application

CRC Cards:

MainView	
<i>Window that holds all other GUI classes and switches between their displays</i>	LoginView CreateAccountView CustomerInventoryView CheckoutView InventoryManagementView Edit/AddProductView SalesDataView Inventory ShoppingCart

LoginView	
<i>GUI for users to login to their account.</i>	CreateAccountView CustomerInventoryView InventoryManagementView Account

CustomerInventoryView	
<i>GUI for customers to browse through inventory items, add products to cart, proceed to checkout.</i>	CreateAccountView LoginView CheckoutView Account Inventory Product ShoppingCart

CreateAccountView	
<i>GUI for users to create a new Customer account.</i>	LoginView CustomerInventoryView Account

InventoryManagementView	
<i>GUI for sellers to view the current state of inventory and update/add new products</i>	LoginView Edit/AddProductView SalesDataView Inventory

CheckoutView	
<i>GUI for customers to review/modify shopping cart contents and complete orders</i>	CustomerInventoryView Account Inventory ShoppingCart PaymentProcessor

SalesDataView	
<i>GUI for sellers to view all costs, revenues, and profits</i>	InventoryManagementView Inventory

Edit/AddProductView	
<i>GUI for sellers to add a new product to inventory or modify and existing product</i>	InventoryManagementView Inventory Product

Account	
<i>Holds username and password Saves username and password to account DB.</i>	CreateAccountView LoginView CustomerInventoryView

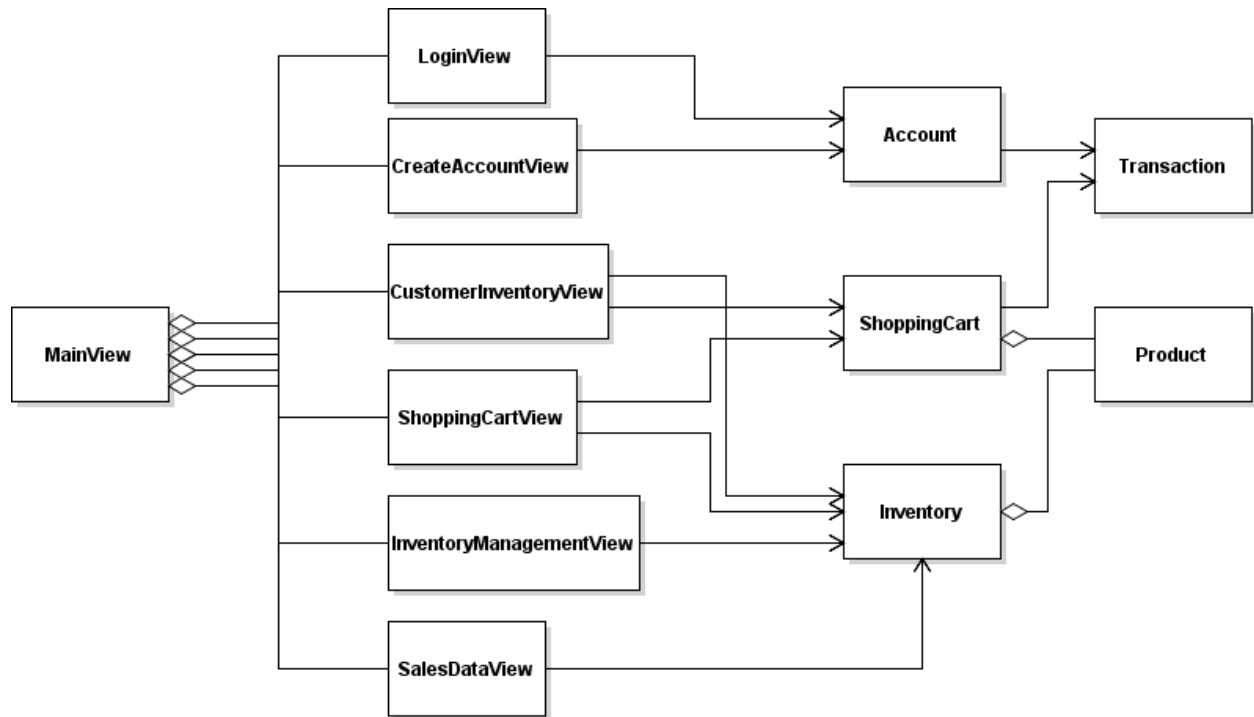
Inventory	
<i>Holds a list of products the Seller has created. Displays the list of products.</i>	CustomerInventoryView InventoryManagementView SalesDataView Product ShoppingCart

Product	
<i>Holds product details (name, type, ID, invoice price, selling price, quantity). Displays product details Creates new products for inventory or updates existing products</i>	CustomerInventoryView Inventory ShoppingCart

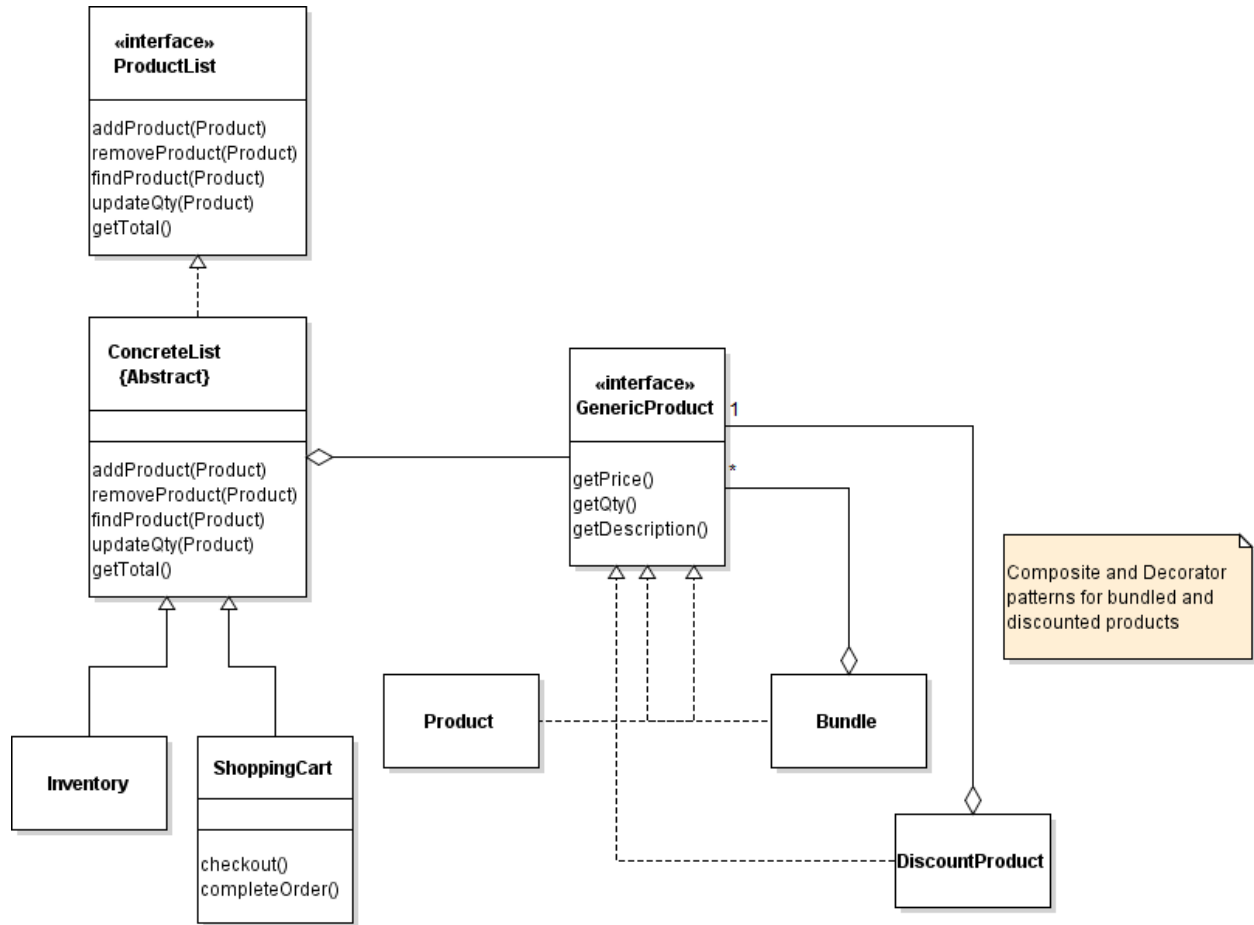
ShoppingCart	
<i>Holds a list of products the Customer has added to their cart. Displays the list of products in the CheckoutView.</i>	CreateAccountView LoginView CustomerInventoryView InventoryManagementView Product ShoppingCart

Class Diagrams

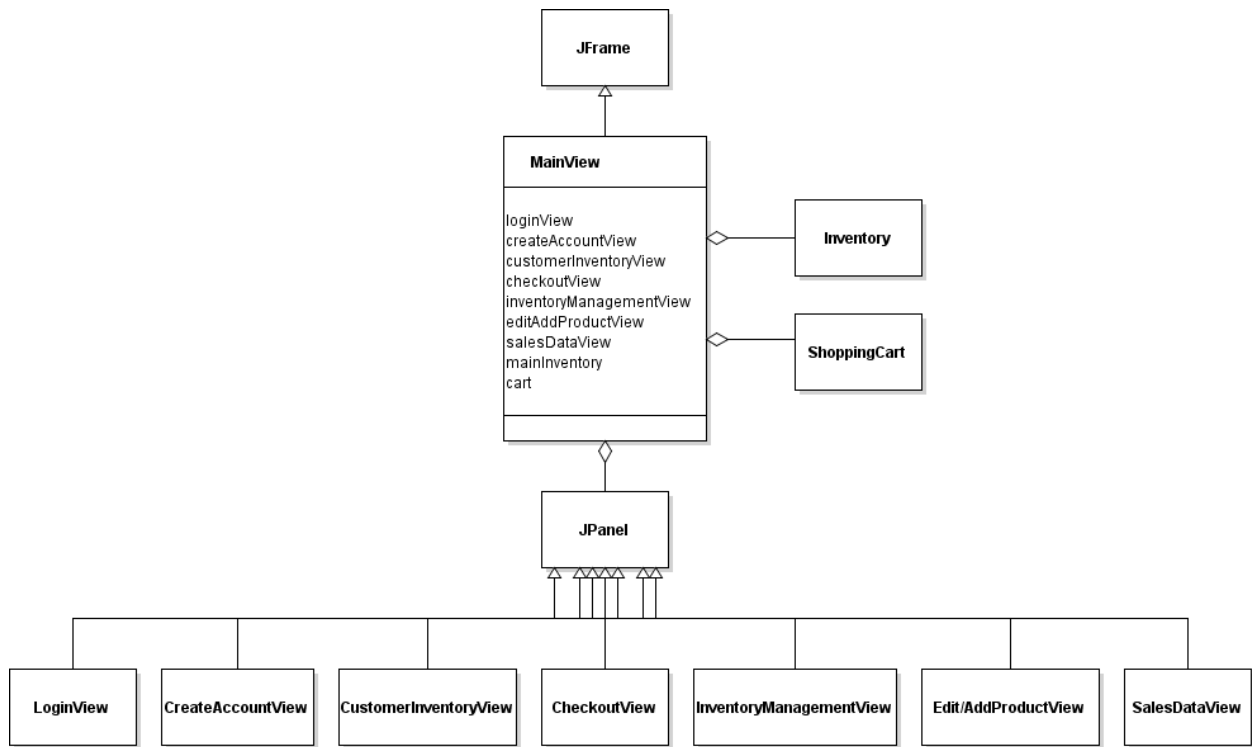
High Level Class Diagram



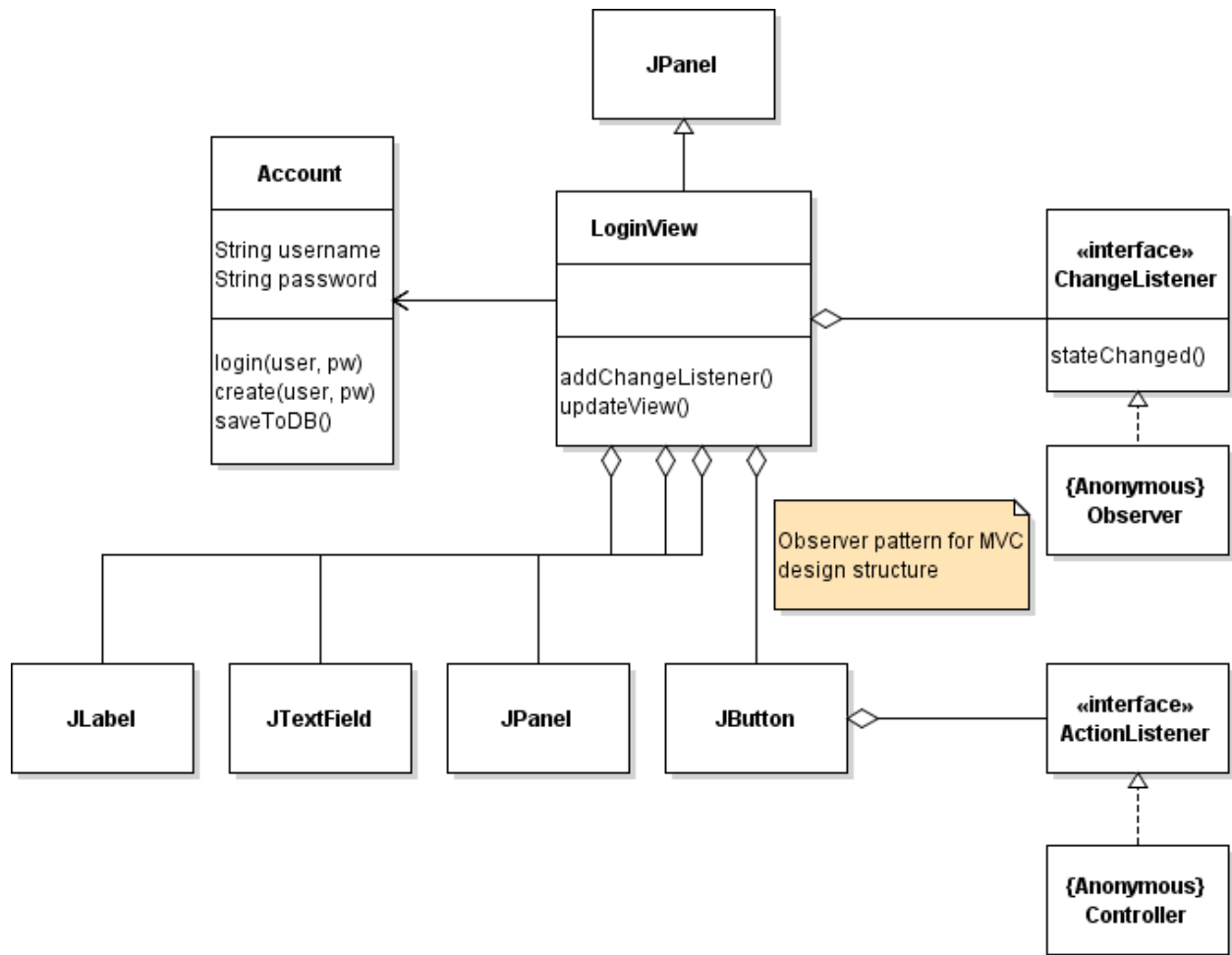
Inventory/ShoppingCart/Product Class Diagram



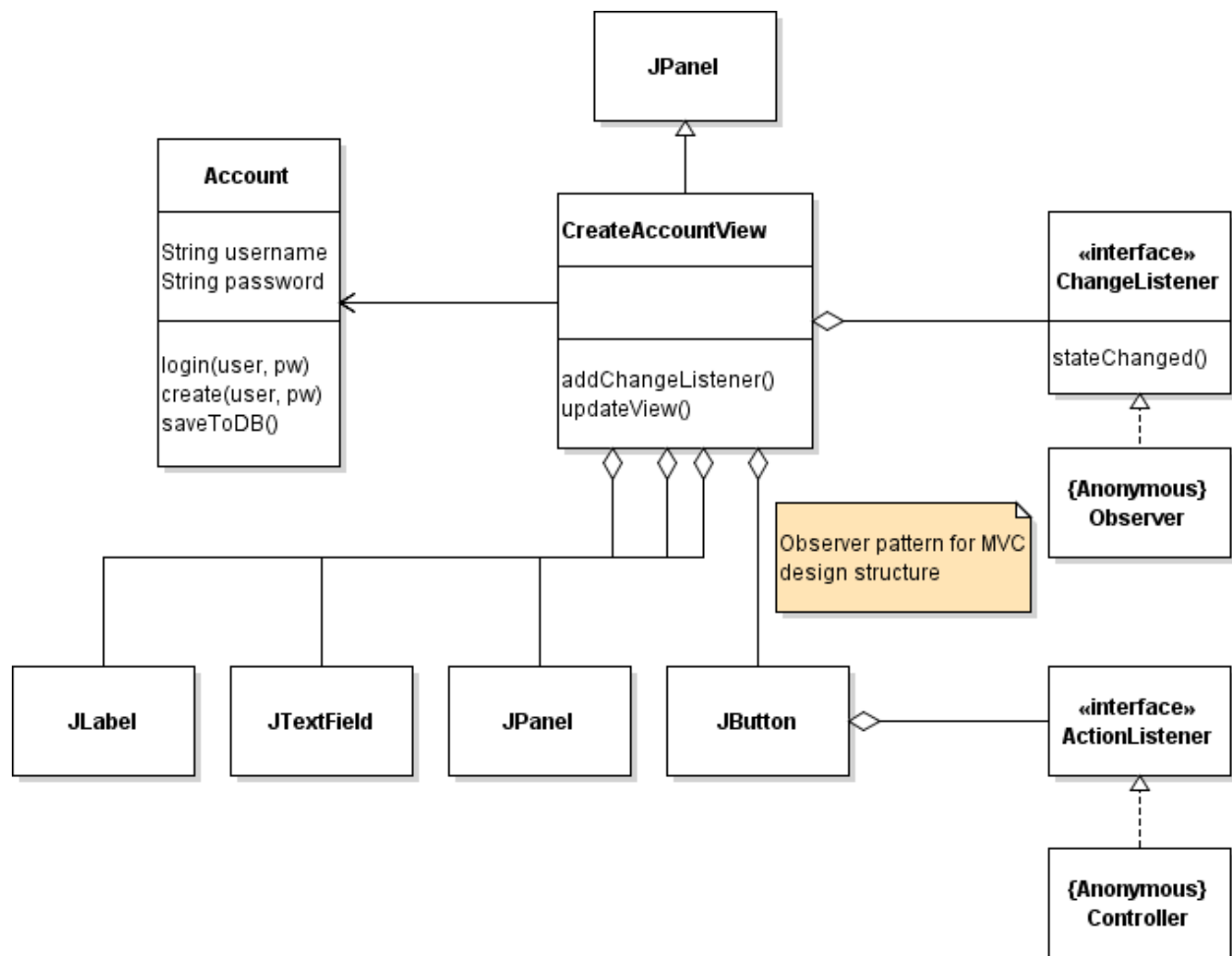
MainView Class Diagram



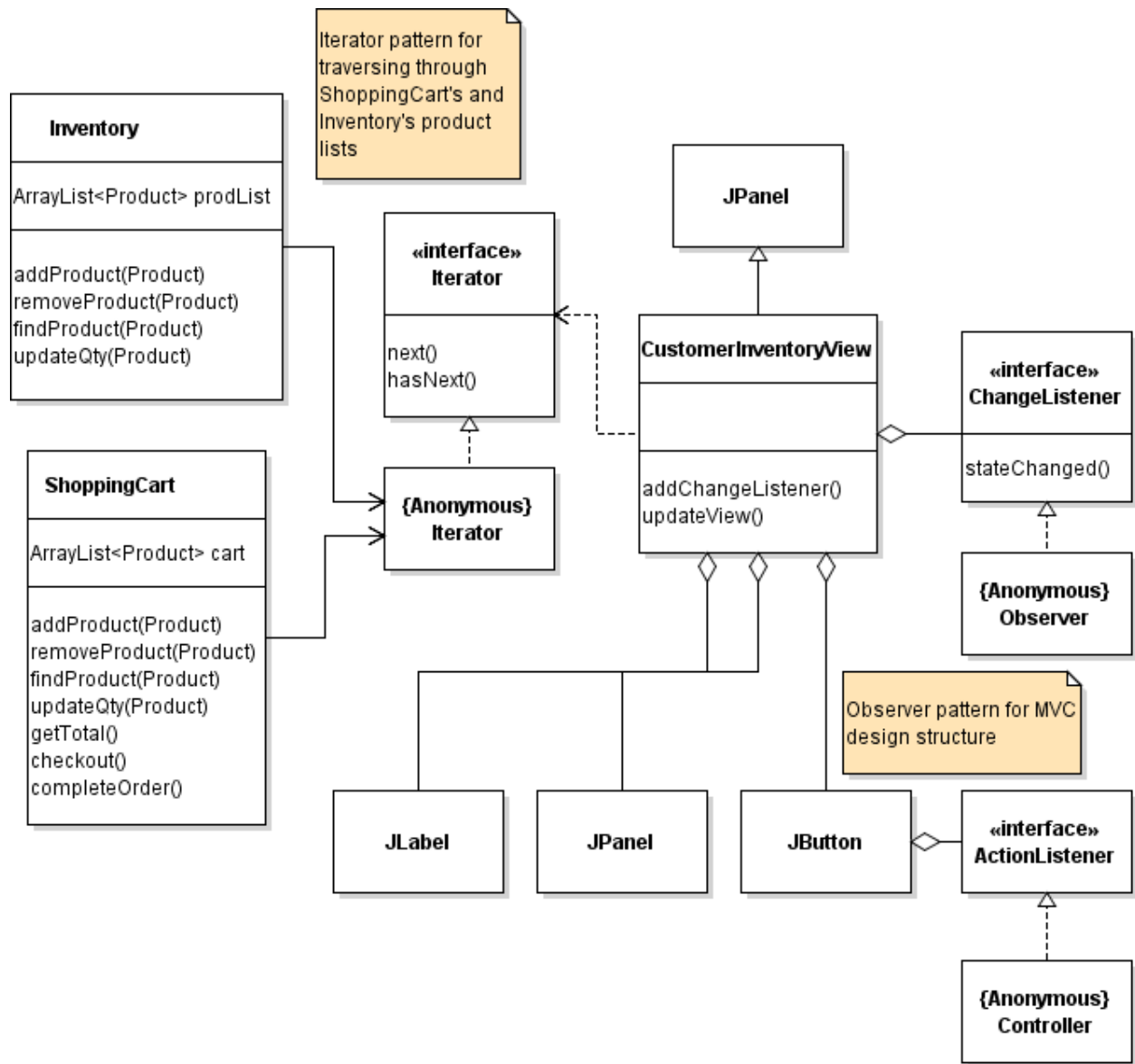
LoginView Class Diagram



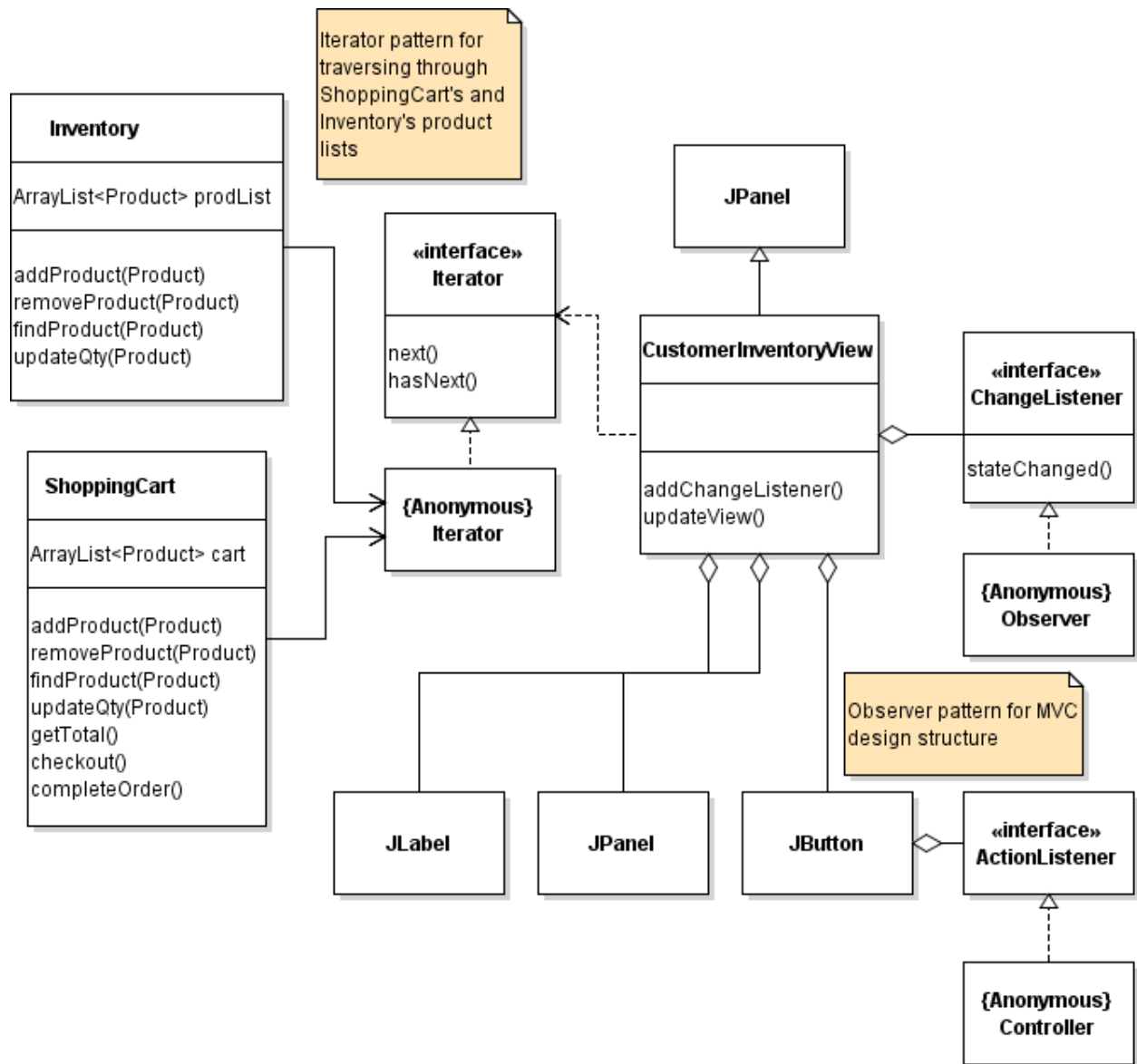
CreateAccountView class diagram



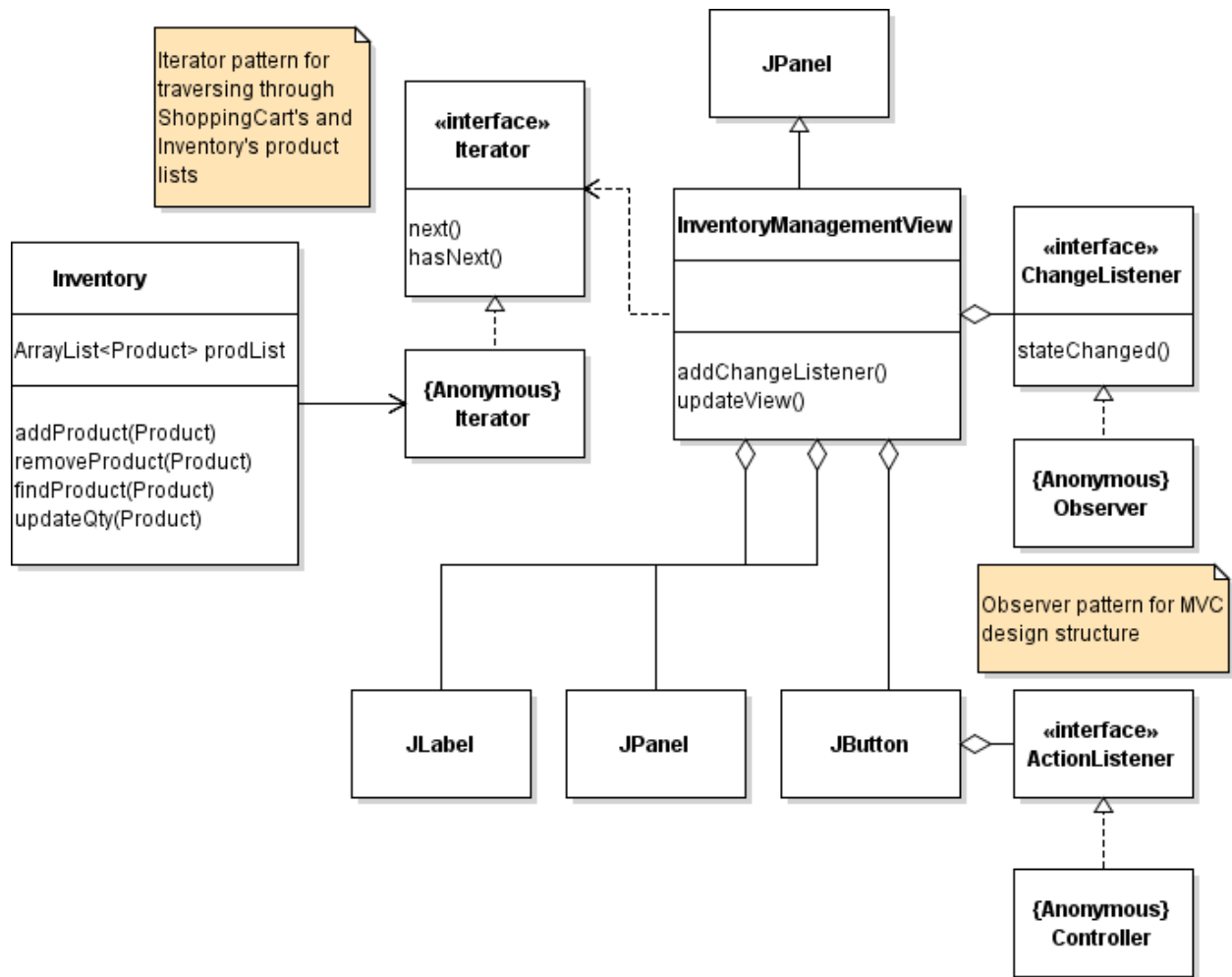
CustomerInventoryView Class Diagram



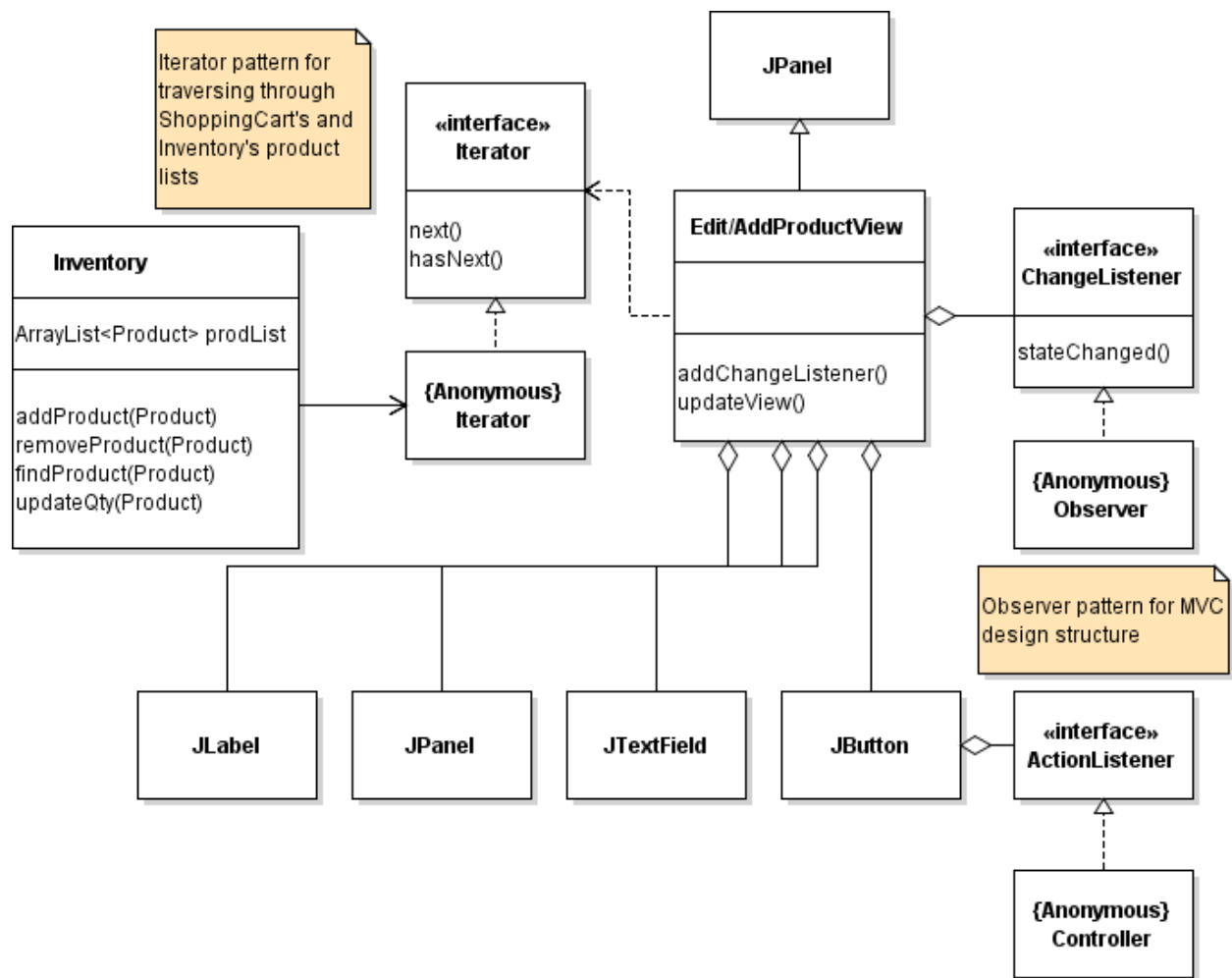
CheckoutView Class Diagram



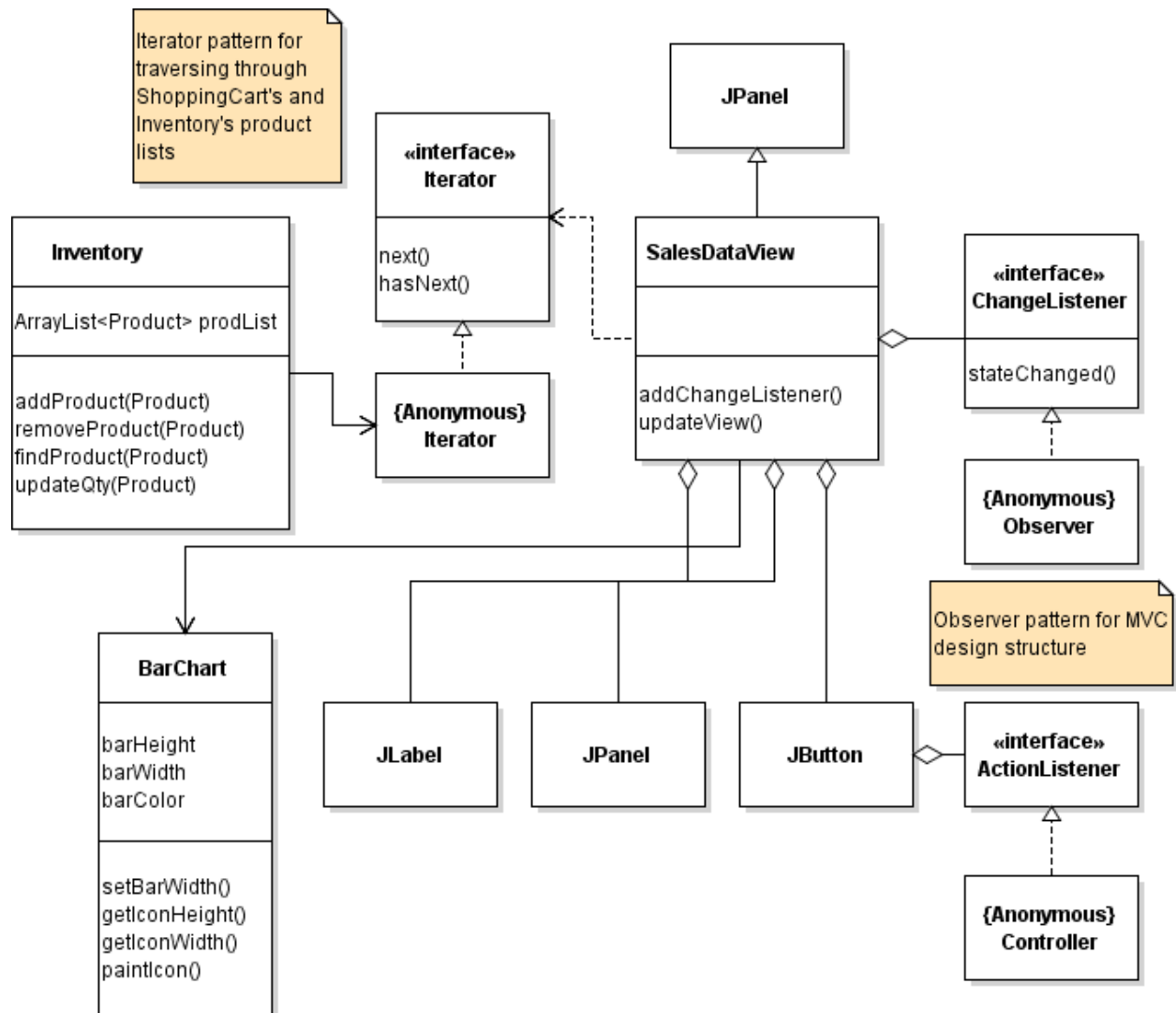
InventoryManagementView Class Diagram



Edit/AddNewProduct Class Diagram

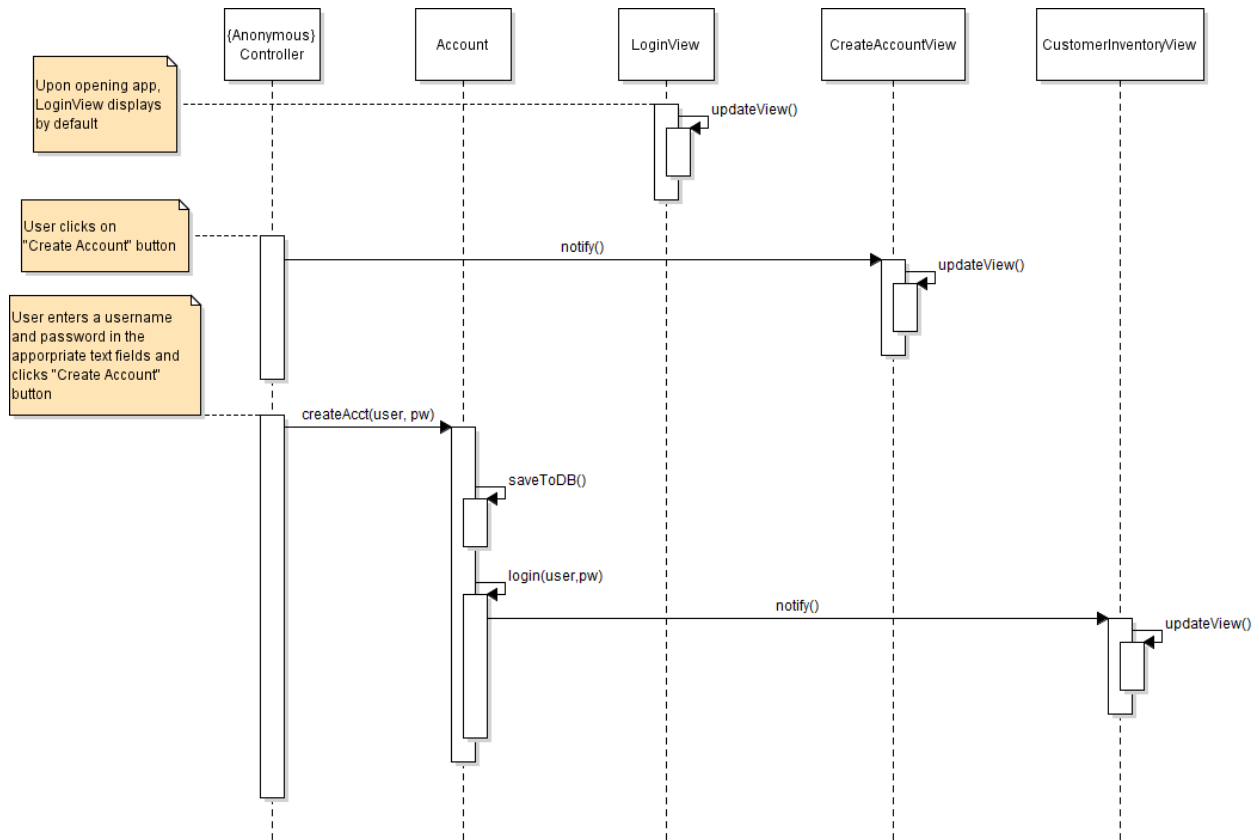


SalesDataView Class Diagram

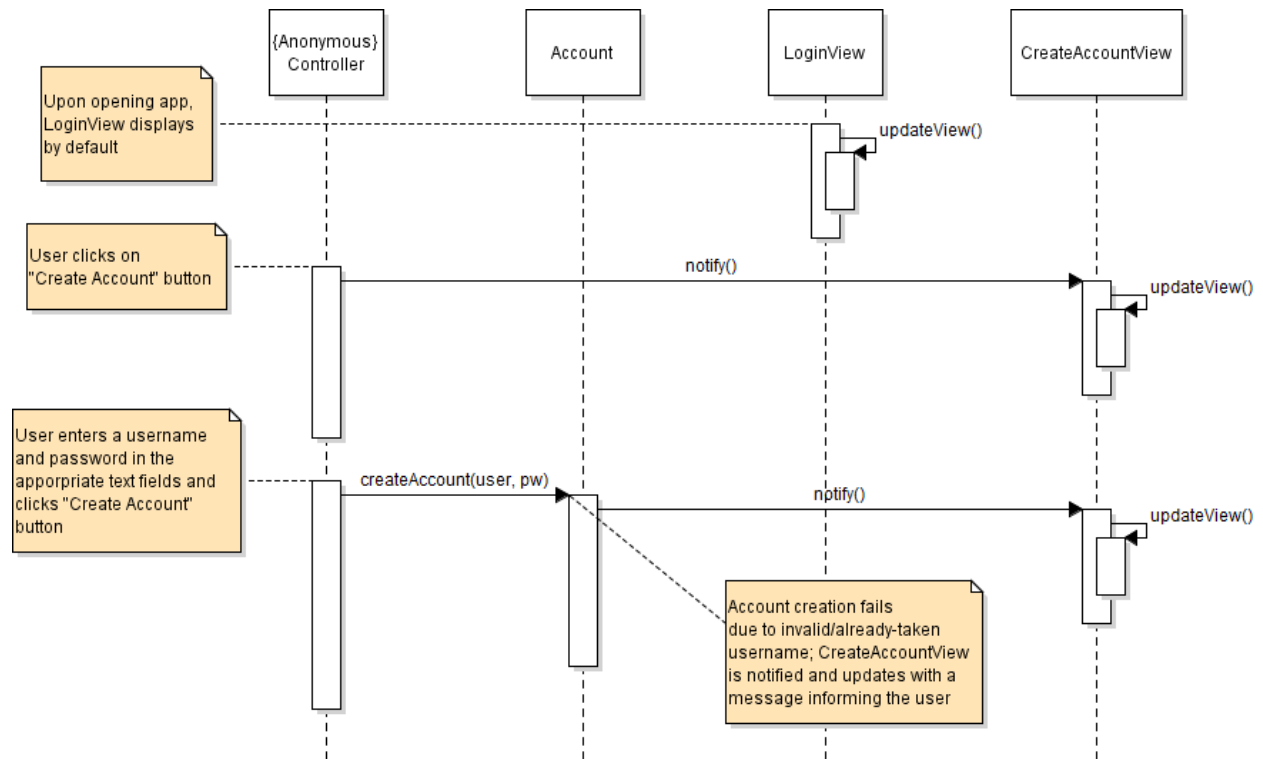


Sequence Diagrams

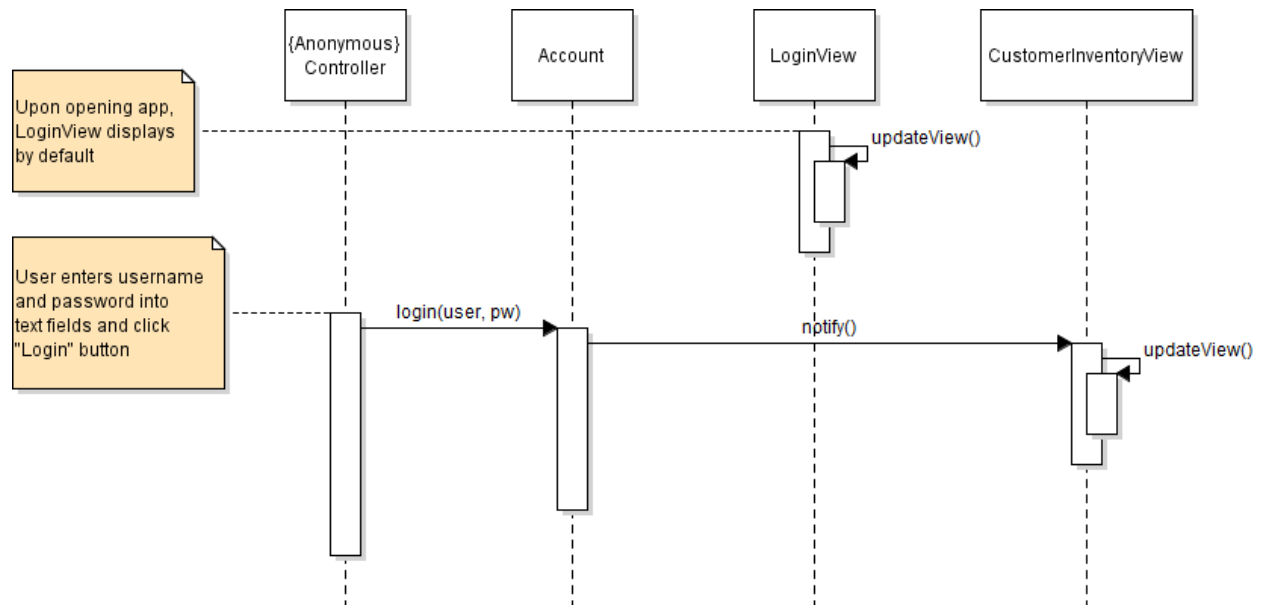
Create Account



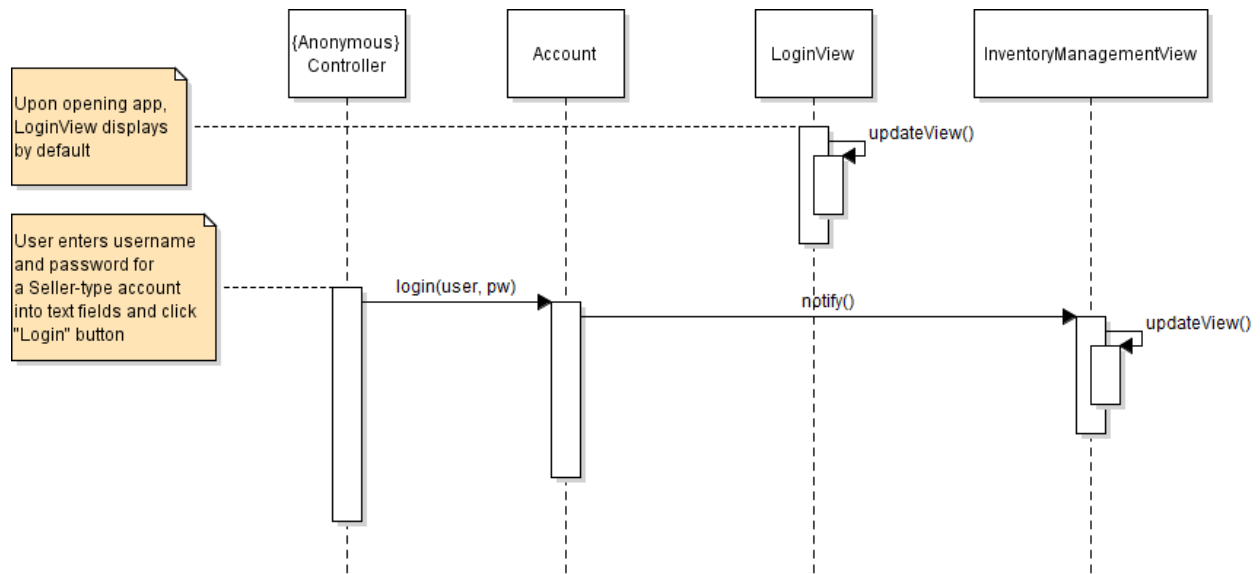
Create Account (Variation 1)



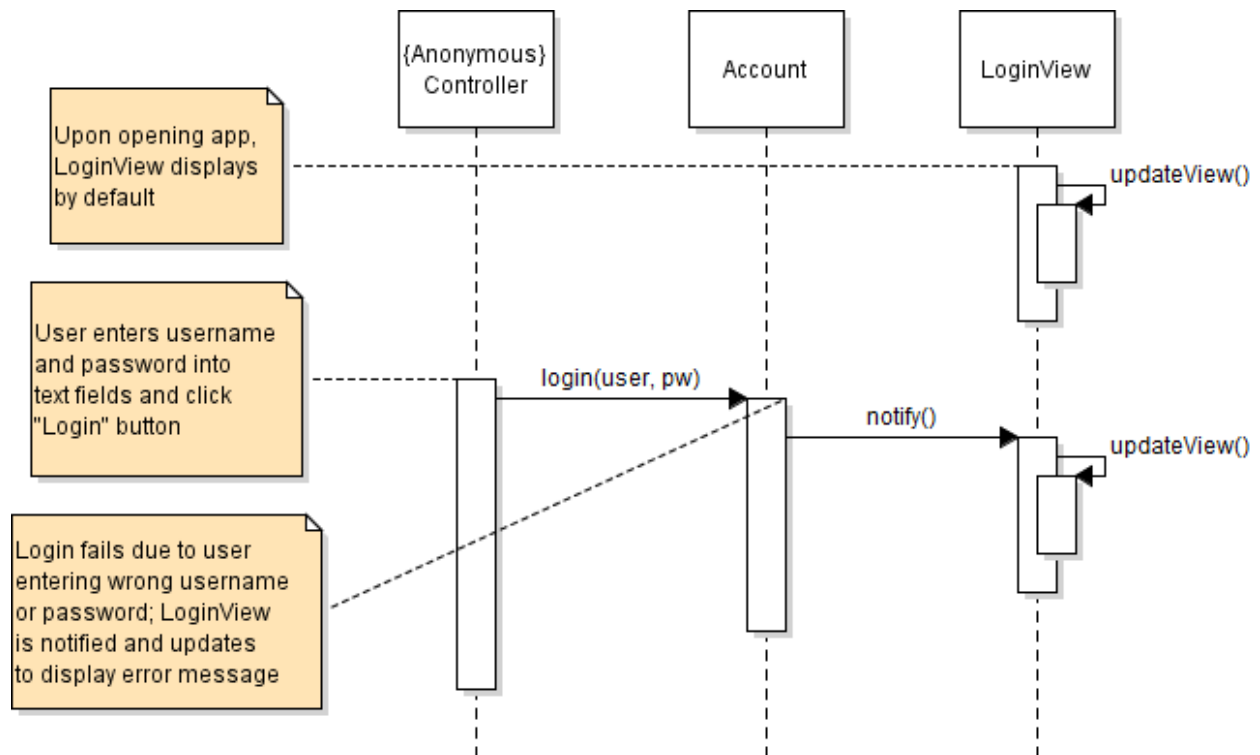
Log In



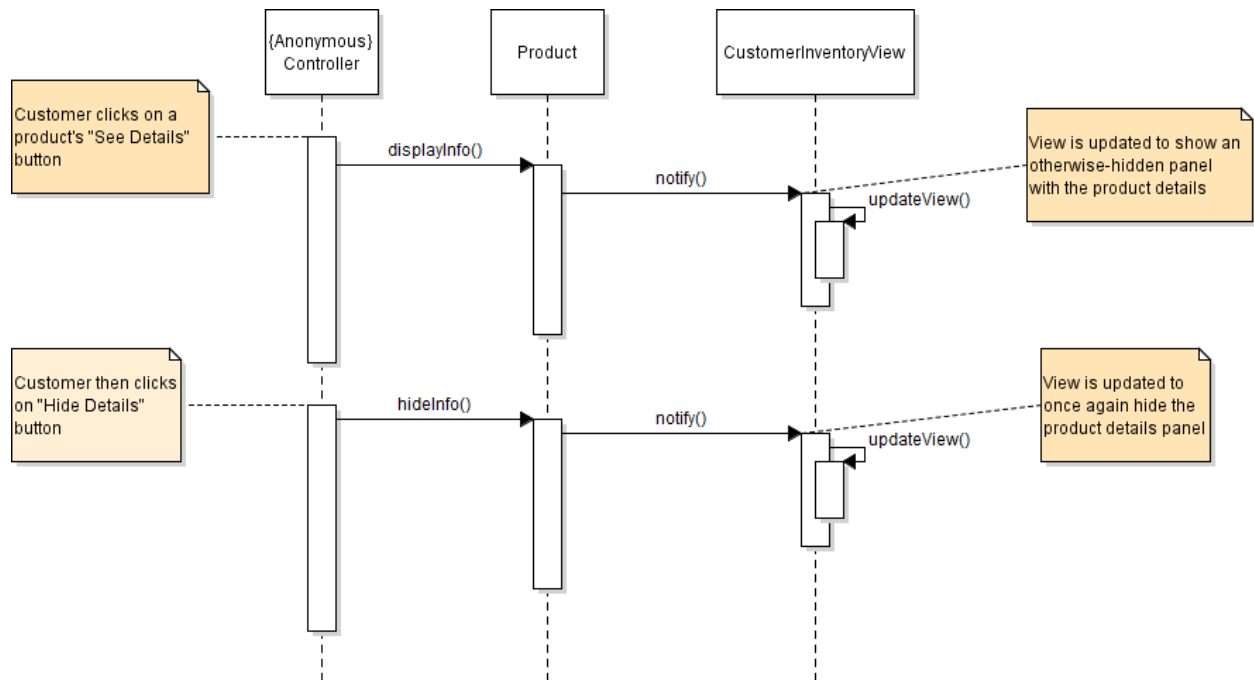
Log In (Variation 1)



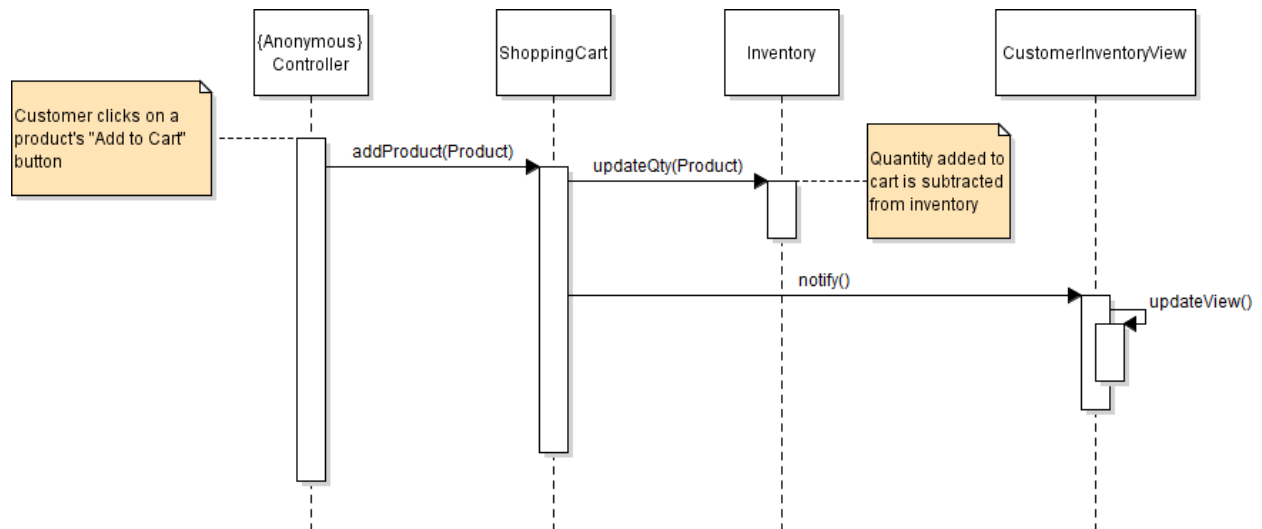
Log In (Variation 2)



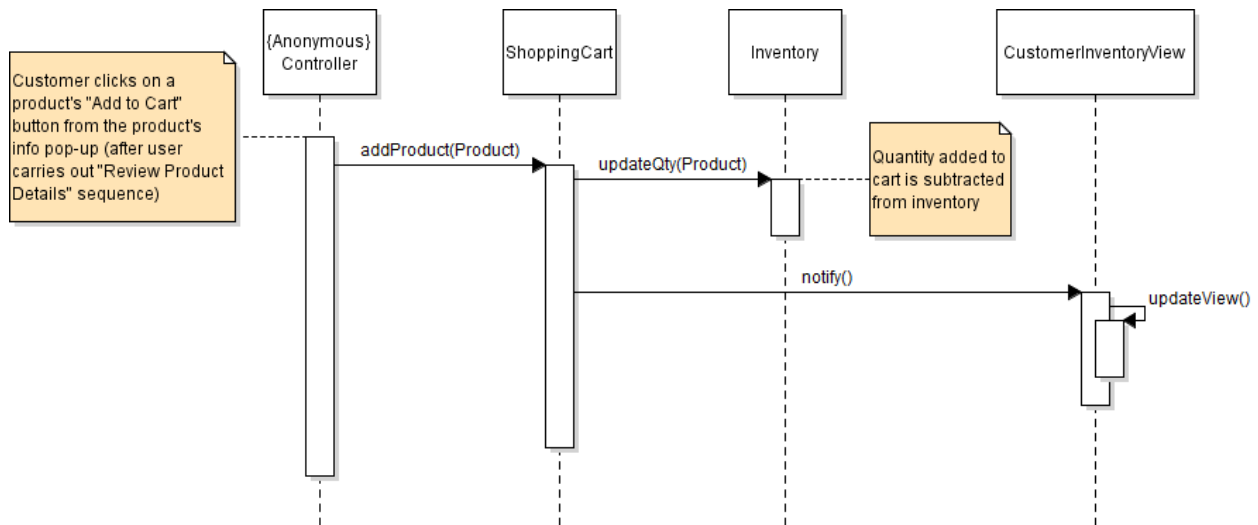
Review Product Details



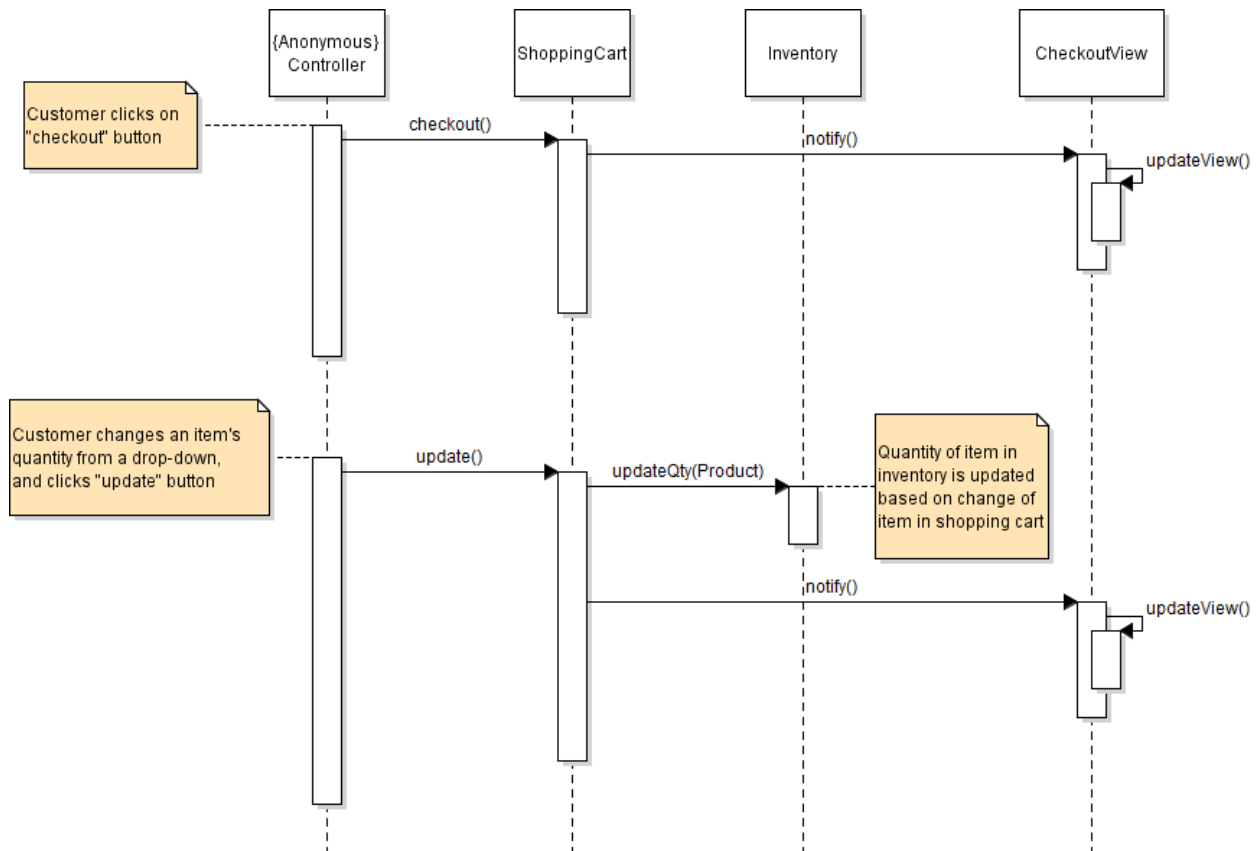
Add Product to Shopping Cart



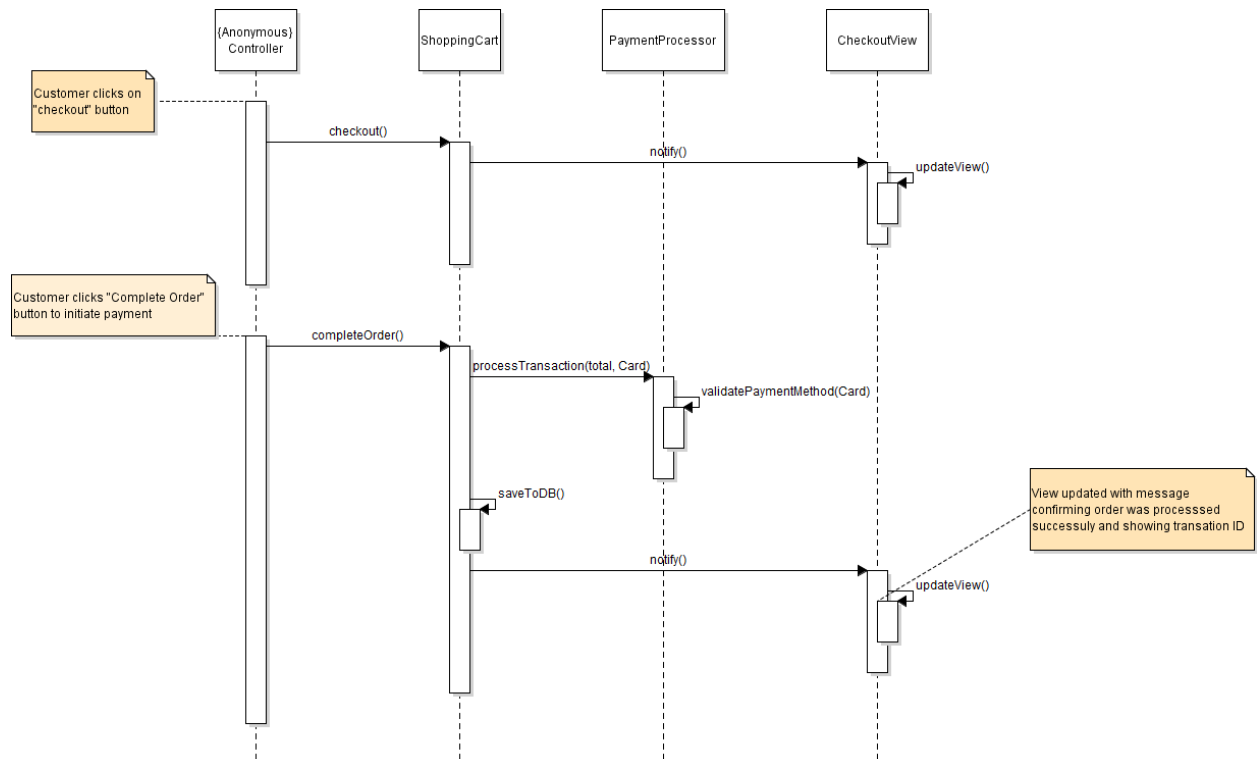
Add Product to Shopping Cart (Variation 1)



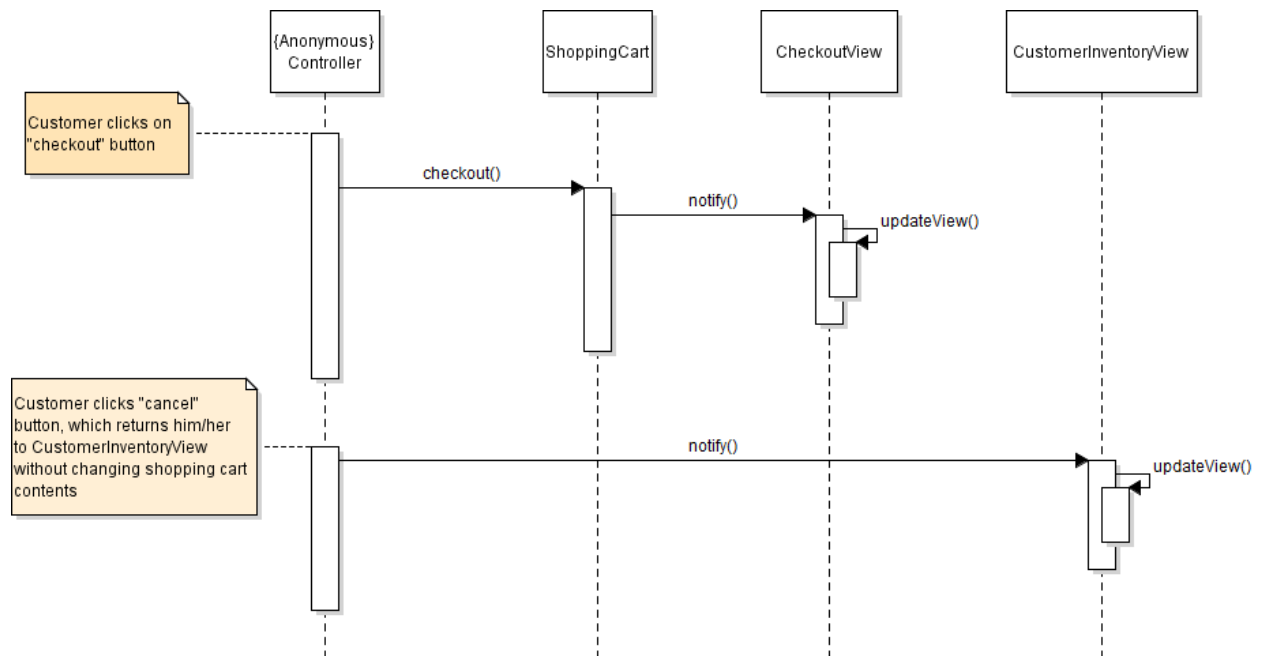
Review/Update Shopping Cart



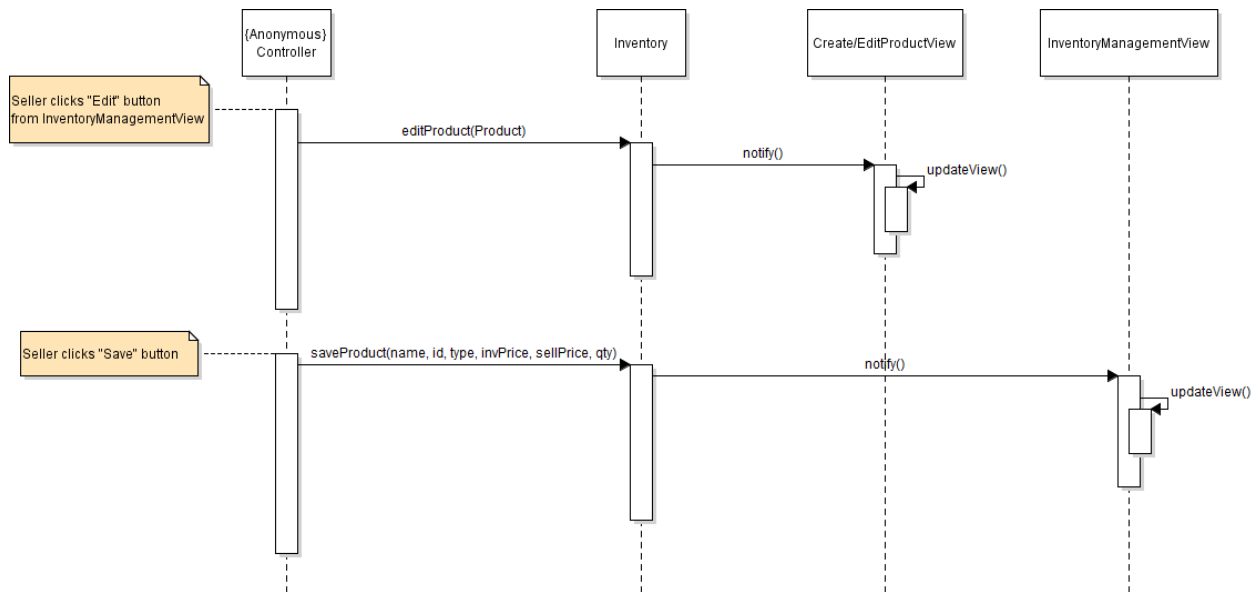
Checkout



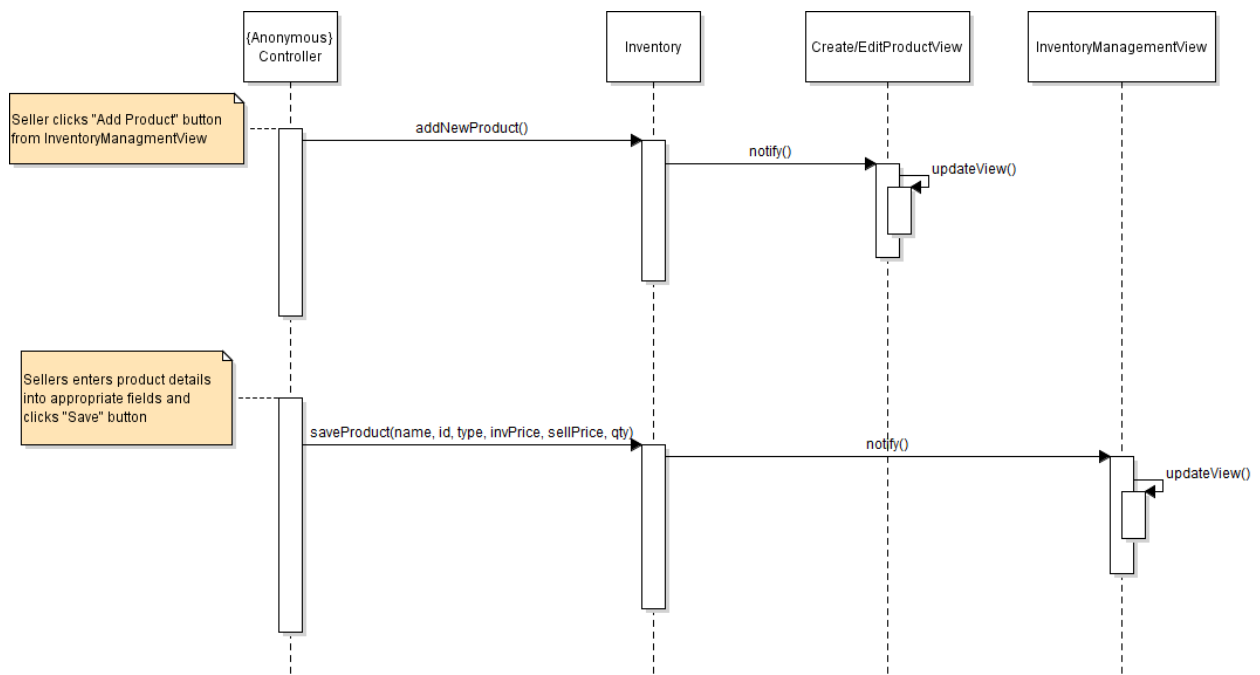
Checkout (Variation 1)



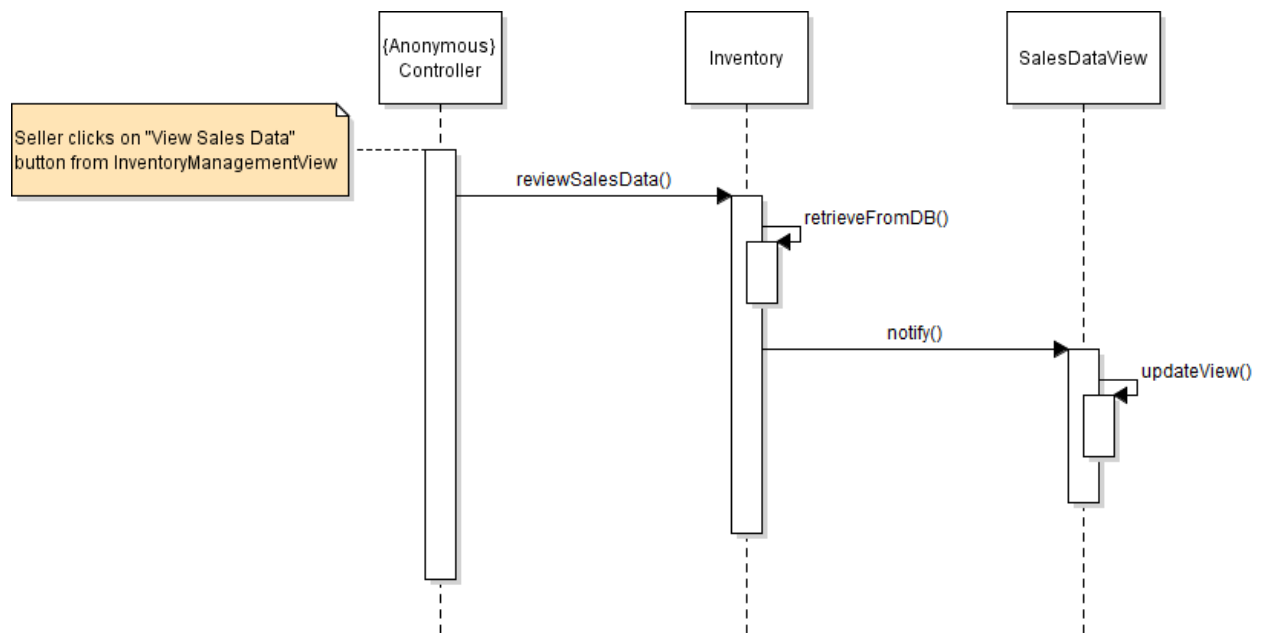
Seller Reviews/Updates Inventory



Seller Adds New Product

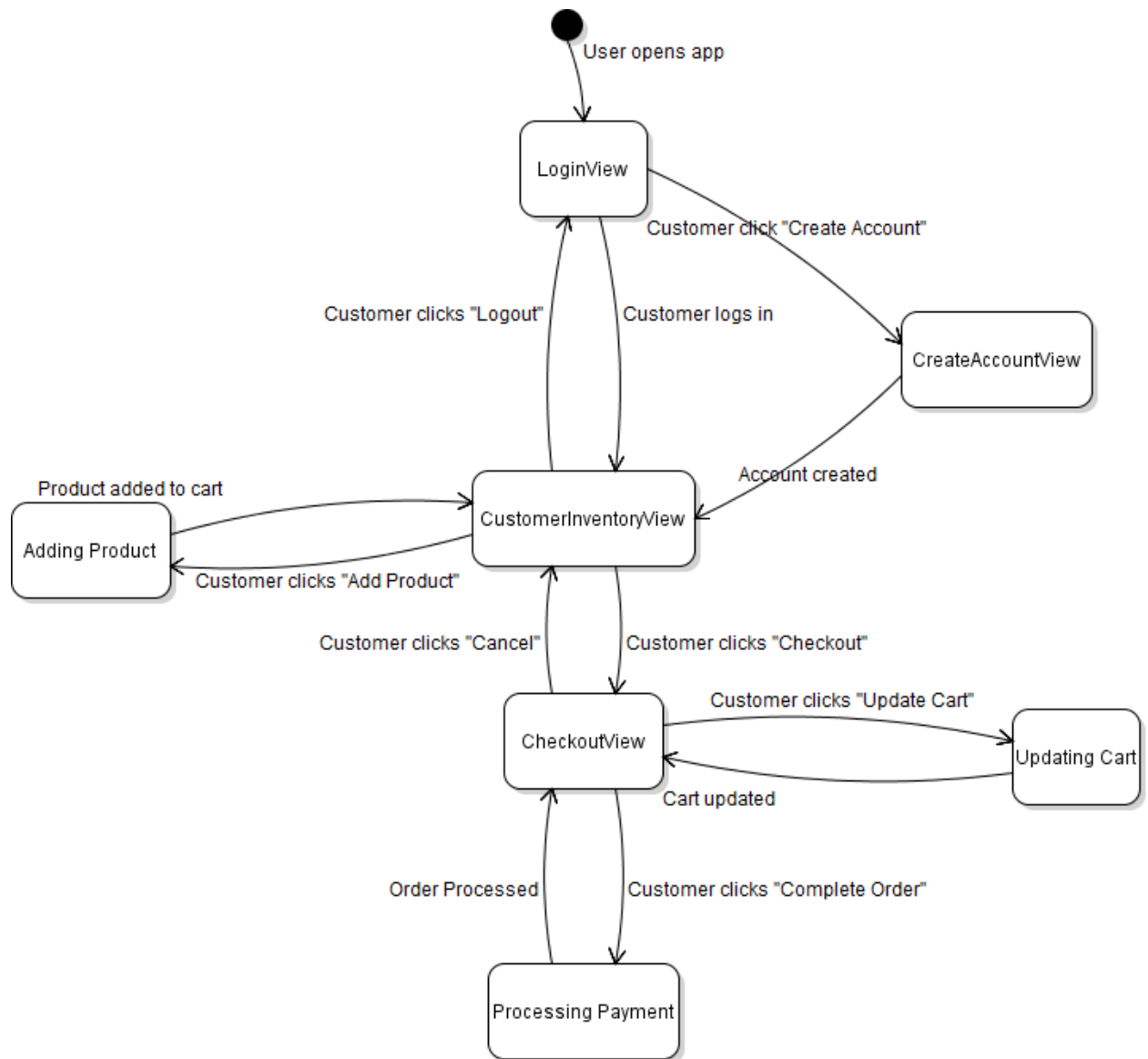


Seller Reviews Costs/Revenues/Profit



State Diagrams

Customer State Diagram



Seller State Diagram

