CST-239 Milestone 3: Inventory Manager and Shopping Cart Report

**Cover Page**

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Course: CST-239: Object-Oriented Programming  
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Title: Milestone 3 – Inventory Manager and Shopping Cart Implementation**

**1. Project Overview**

This milestone builds upon the StoreFront application by implementing two key modules: InventoryManager and ShoppingCart. The objective is to demonstrate object-oriented design principles such as abstraction, inheritance, composition, and interface implementation in a functional console-based shopping system.

**2. UML Class Diagrams**

The following class diagrams were created and updated as required by the assignment:

* Salable Product Hierarchy – Includes SalableProduct, Weapon, Armor, and HealthItem. Weapon implements Comparable<Weapon> for alphabetical sorting.
* InventoryManager – Manages all store inventory including adding, removing, and listing items.
* ShoppingCart – Manages cart operations such as adding, removing, emptying, and viewing items.
* StoreFrontApp Integration – Shows composition relationships between StoreFrontApplication, InventoryManager, and ShoppingCart.

**3. Application Design Features**

* **InventoryManager:**
  + Initializes store inventory on startup.
  + Handles product purchases and restocking upon cancellation.
  + Provides an internal product ID system for easy user reference.
* **ShoppingCart:**
  + Stores all purchased items.
  + Allows users to view and empty their cart.
  + Integrates seamlessly with inventory operations**.**
* **Weapon Comparison:**
  + All Weapon objects implement Comparable<Weapon> using case-insensitive alphabetical sorting by name**.**

**4. Flowchart**

A flowchart diagram was updated to reflect user interactions with the extended system, illustrating the integration of InventoryManager and ShoppingCart with the Store Front interface.

**5. Java Code Implementation**

All classes were implemented in Java and organized using a clean package structure:

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edu.gcu.storefront.model

edu.gcu.storefront.service

* JavaDoc comments were provided for all public methods and classes.
* JavaDoc HTML documentation was generated using the javadoc tool and stored under /docs.

**6. Application Demonstration**

A video screencast has been recorded that demonstrates:

* Launching the application
* Viewing product inventory
* Purchasing and canceling items
* Managing the shopping cart
* Reviewing how code aligns with UML diagrams and object-oriented principle

**7. Conclusion**

This milestone successfully integrates an inventory and cart system into the StoreFront application. It reinforces real-world object-oriented design practices and demonstrates how abstraction, composition, and interfaces can be used to build maintainable Java applications**.**

Screencast Video

The full demonstration, including UML, flowchart, code walkthrough, JavaDoc, and functionality, can be viewed here:

**GitHub Repository (Optional)**

The full project is also available publicly on GitHub: