Smart Supply Chain Management System - Implementation Rubric

OOP Features Implementation Summary

| OOP Feature | Requirement | Implementation Count | Implementation Details |
|---------------------------------------|-------------|-------------------------|--|
| I. Overloaded Methods | Minimum 2 | 10+ | - User.login(String) and User.login(String, String) < br>- Inventory.addStock(Product, int) and Inventory.addStock(Object) < br>- NotificationService.sendLowStockAlert() (3 versions) < br>- ReportGenerator.generateInventoryReport() methods < br>- Admin.generateSystemReport() methods < br>- Supplier.updateProductPrice() methods < br>- WarehouseManager.allocateSpace() methods |
| II. Overloaded Constructor s | Minimum 2 | 8+ | - User class (4 constructors) < br>- Product class (4 constructors) < br>- Order class (4 constructors) < br>- Inventory class (2 constructors) < br>- Admin, Supplier, Warehouse Manager, Retailer classes (4+ constructors each) |
| III. Vararg Overloading | Minimum 2 | 6+ | - User constructor with varargs for contact methods NotificationService.sendLowStockAlert(Object) ct) Supplier.updateProductPrices(Object) - Order constructor with varargs constructor with varargs for attributes FileHandler.deleteFiles(String) |
| IV. Nested Classes | At least 1 | 3 | - User.UserSession (static inner class for session tracking) br>- Product.Dimensions (static nested class) br>- Analytics.AdvancedAnalytics (nested interface) |

| V. Abstract Class | Minimum 1 | 1 | - User abstract class with abstract hasPermission() method |
|-------------------------------------|----------------------|----------|--|
| VI. Interface | Minimum 1 | 2 | - Analytics interface - Analytics.AdvancedAnalytics nested interface |
| VII. Hierarchical Inheritance | At least 1 | 1 | - User \rightarrow Admin, Supplier, WarehouseManager, Retailer |
| VIII. Multiple Inheritance | At least 1 | 1 | - AnalyticsImpl implements both Analytics and AdvancedAnalytics interfaces |
| IX. Wrappers | Required | Many | - Used throughout: Integer, Double, Boolean objects br>- Autoboxing/unboxing with collections and maps br>- Wrapper utility methods |
| X. Package | Required | 4 | <pre>- com.smartsupply.model - com.smartsupply.service - com.smartsupply.util - com.smartsupply.exception</pre> |
| XI. Exception Handling | At least 2 cases | 3+ | - Custom AuthenticationException for login/user management errors br>- Custom InventoryException for inventory operations br>- Try-catch blocks for file operations vith exception handling |
| XII. I/O Operations | At least 1 from each | Multiple | - File Handling: FileHandler methods for reading/writing files br>- Scanner: User input handling in SupplyChainManagementSystem |

Additional Features Implemented

- Enum types for Role and OrderStatus
- Service-oriented architecture
- Utility classes for common operations
- Main application with interactive console interface
- Comprehensive error handling
- In-memory data persistence (with serialization capability)
- Report generation and export

Class Organization

The system consists of the following major classes:

Model Classes

- User (abstract)
 - Admin
 - Supplier
 - WarehouseManager
 - o Retailer
- Product
- Inventory
- Order
- Role (enum)
- OrderStatus (enum)

Service Classes

- Authentication
- NotificationService
- Analytics (interface)
- AnalyticsImpl

Utility Classes

- FileHandler
- BarcodeScanner
- ReportGenerator

Exception Classes

- AuthenticationException
- InventoryException

Main Application

• SupplyChainManagementSystem