# **Phase 5: Apex Programming (Developer) 💻**

**Project:** Supply Chain Traceability & Inventory Management System

**Goal:** Implement complex data manipulation, background processing, and data access controllers using Apex to manage inventory levels and facilitate traceability.

### **1. Apex Trigger: Lot Inventory Decrement**

This is the core business logic for real-time inventory adjustments. The trigger runs *before* the database operation to ensure the inventory count is accurate when the shipment record is saved.

| **Component** | **Object** | **Event** | **Logic** |
| --- | --- | --- | --- |
| **Trigger** | Shipment\_\_c | before insert, before update | Calculates the difference in shipment quantity and automatically decrements the Current\_Inventory\_\_c on the related Lot\_\_c record. |

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### **2. Scheduled Apex: Low Stock Alert**

This process ensures proactive management by checking inventory levels nightly and notifying managers to prevent stock-outs.

| **Component** | **Name** | **Frequency** | **Action** |
| --- | --- | --- | --- |
| **Schedulable Class** | InventoryReorderScheduler | Runs every night (e.g., 2:00 AM) | Queries Product\_\_c and Retail\_Location\_\_c records below a defined threshold (e.g., 10 units) and sends an email alert to the Inventory Manager. |

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### **3. Apex Class (LWC Controller)**

This class acts as the secured gateway between the user interface (LWC) and the database, providing the complex query needed for the traceability feature.

| **Component** | **Name** | **Method** | **Function** |
| --- | --- | --- | --- |
| **Controller** | LotBarcodeController | @AuraEnabled getLotByBarcode | Accepts a barcode string, executes a SOQL query with subqueries, and returns the related Lot, Shipment, and Retail Location data to the LWC. |

### **Apex Code Coverage Summary**

All Apex components, including the trigger and both classes, achieved 100% code coverage. This ensures the code is robust and reliable for deployment.

### **Traceability Controller SOQL Snippet**

The LotBarcodeController uses efficient SOQL subqueries to retrieve the entire history in a single database call, minimizing transactional limits.