PHASE 5 – Apex Programming

Advanced Server-Side Logic for Retail Operations

1. Introduction

Phase 5 focuses on the Apex programming customizations required to support HandsMenThreads' advanced retail workflows. While Salesforce Flows and declarative tools automate a wide range of processes, certain business rules demanded more precision, control, and transactional consistency than point-and-click configuration could provide. Apex triggers, classes, and test methods were implemented to meet these requirements.

For a retail brand like HandsMenThreads, order processing, inventory control, and loyalty calculations must be both precise and reliable. Apex ensures that multi-step operations occur atomically, preventing data inconsistencies such as incorrect stock levels or loyalty miscalculations. Apex also handles complex calculations, provides scalability, and creates a framework for future integration features.

This phase describes the Apex components created, the justification behind each, the technical design considerations, and the testing performed to guarantee smooth operation.

2. Apex Trigger for Order Total Calculation

Business Need

Orders may consist of multiple products, each with different prices and quantities. Salesforce must automatically compute the total cost of an order without relying on manual input from sales executives. Any modification in Order Items must instantly update the Order Total.

Technical Approach

A trigger on the Order_Item__c object was developed using **after insert**, **after update**, and **after delete** events to ensure recalculation occurs whenever line items change.

How It Works

1. Collect all Order Item records related to an Order.
2. Sum the Line_Total__c field.
3. Use a SOQL aggregate query to optimize performance.
4. Update the Order__c.Order_Total__c field.

Key Considerations

- Bulkification ensures the trigger processes multiple records efficiently.
- Try-catch blocks handle exceptions like missing product data.
- The logic supports future enhancements like discounts and taxation.

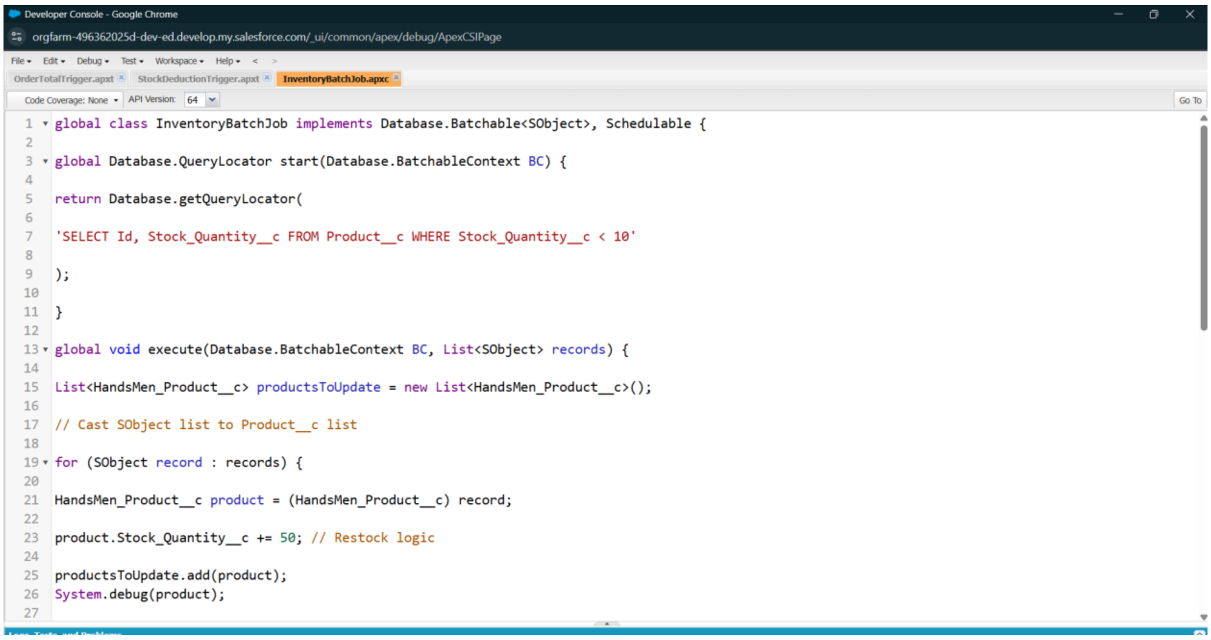
3. Apex Trigger for Stock Deduction

Business Need

Inventory accuracy is the backbone of any retail operation. Manual stock updates lead to overselling, customer dissatisfaction, and increased operational overhead. Salesforce must deduct stock automatically when an Order Item is created and return stock if an Order Item is removed or modified.

Technical Approach

A before-insert and before-update trigger was implemented to adjust stock levels. Additionally, a before-delete handler restores stock when items are removed.


Developer Console - Google Chrome
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OrderTotalTrigger.apxt
StockDeductionTrigger.apxt
InventoryBatchJob.apxc
Code Coverage: None
API Version: 64
Go To

```
global class InventoryBatchJob implements Database.Batchable<SObject>, Schedulable {

global Database.QueryLocator start(Database.BatchableContext BC) {

return Database.getQueryLocator(

'SELECT Id, Stock_Quantity__c FROM Product__c WHERE Stock_Quantity__c < 10'

);

}

global void execute(Database.BatchableContext BC, List<SObject> records) {

List<HandsMen_Product__c> productsToUpdate = new List<HandsMen_Product__c>();

// Cast SObject list to Product__c list

for (SObject record : records) {

HandsMen_Product__c product = (HandsMen_Product__c) record;

product.Stock_Quantity__c += 50; // Restock logic

productsToUpdate.add(product);
System.debug(product);

```

Stock Deduction Logic

1. Fetch the Product__c record using the SKU or Product ID.
2. Check if the requested quantity exceeds the available stock.
3. If yes → trigger an error preventing the save operation.
4. If no → deduct the exact quantity from the stock.
5. Update the Product__c.Stock__c field.

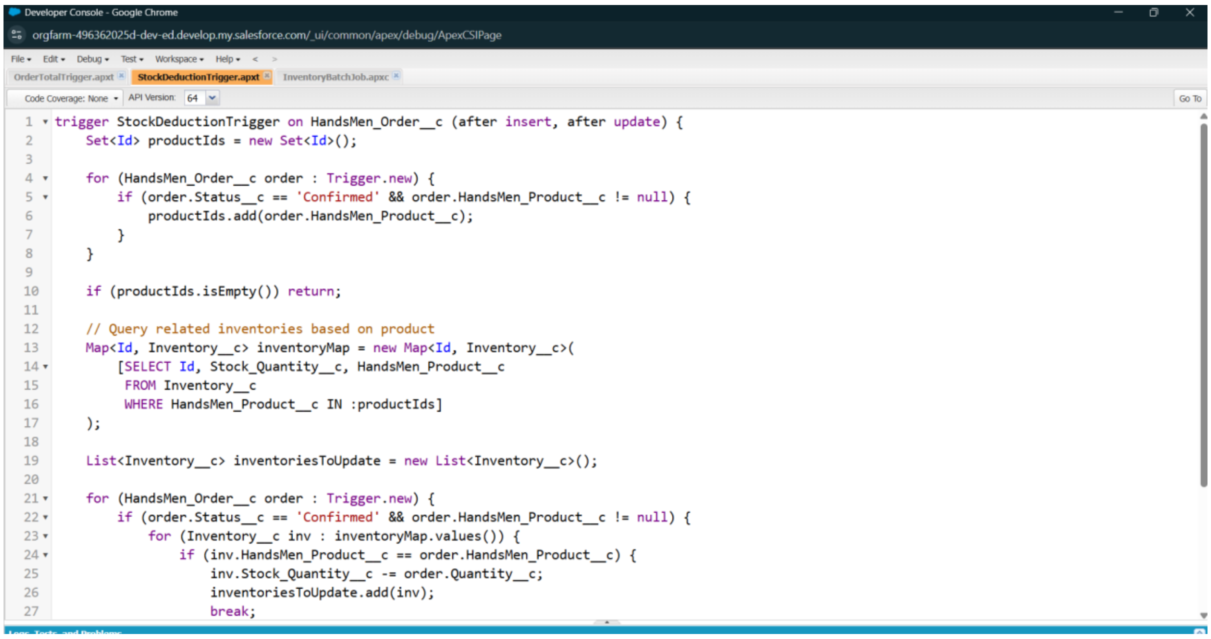
Concurrency Handling

Using **SELECT FOR UPDATE**, the trigger prevents race conditions during simultaneous ordering, ensuring the stock is updated sequentially and consistently.

Low-Stock Integration

If the remaining stock falls below Reorder_Level__c, Apex can optionally:

- Call a Flow via Flow.Interview.run().
- Send a platform event for real-time alerts.
- Log the event in a custom Low_Stock_Log__c object.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File Edit Debug Test Workspace Help
OrderTotalTrigger.apxt
StockDeductionTrigger.apxt
InventoryBatchJob.apxc
Code Coverage: None
Go To

API Version: 64

```
trigger StockDeductionTrigger on HandsMen_Order__c (after insert, after update) {
    Set<Id> productIds = new Set<Id>();

    for (HandsMen_Order__c order : Trigger.new) {
        if (order.Status__c == 'Confirmed' && order.HandsMen_Product__c != null) {
            productIds.add(order.HandsMen_Product__c);
        }
    }

    if (productIds.isEmpty()) return;

    // Query related inventories based on product
    Map<Id, Inventory__c> inventoryMap = new Map<Id, Inventory__c>(
        [SELECT Id, Stock_Quantity__c, HandsMen_Product__c
         FROM Inventory__c
         WHERE HandsMen_Product__c IN :productIds]
    );

    List<Inventory__c> inventoriesToUpdate = new List<Inventory__c>();

    for (HandsMen_Order__c order : Trigger.new) {
        if (order.Status__c == 'Confirmed' && order.HandsMen_Product__c != null) {
            for (Inventory__c inv : inventoryMap.values()) {
                if (inv.HandsMen_Product__c == order.HandsMen_Product__c) {
                    inv.Stock_Quantity__c -= order.Quantity__c;
                    inventoriesToUpdate.add(inv);
                    break;
```

4. Apex for Loyalty Points Computation

Business Need

HandsMenThreads uses a loyalty program to incentivize repeat purchases. Customers earn points based on order total. Once they reach thresholds, their loyalty tier automatically upgrades.

Loyalty Tiers

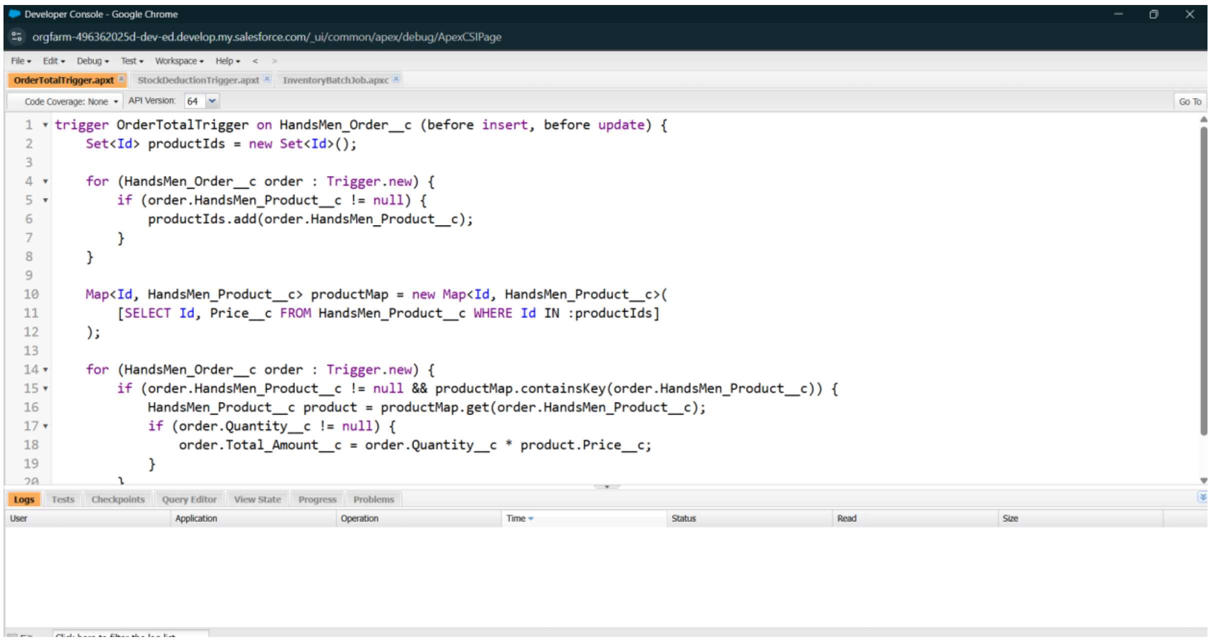
- **Silver:** 500 points
- **Gold:** 1000 points
- **Platinum:** 2000 points

How the Apex Logic Works

Triggered when an order’s status becomes “Delivered”:

1. Retrieve Order_Total__c.
2. Multiply by **5%** to calculate loyalty points.
3. Add the points to the Customer’s existing balance.
4. Evaluate tier upgrade conditions.
5. Update Customer record with:
   - New loyalty tier
   - Tier upgrade date

- ○ Total points



```
trigger OrderTotalTrigger on HandsMen_Order__c (before insert, before update) {
    Set<Id> productIds = new Set<Id>();

    for (HandsMen_Order__c order : Trigger.new) {
        if (order.HandsMen_Product__c != null) {
            productIds.add(order.HandsMen_Product__c);
        }
    }

    Map<Id, HandsMen_Product__c> productMap = new Map<Id, HandsMen_Product__c>(
        [SELECT Id, Price__c FROM HandsMen_Product__c WHERE Id IN :productIds]
    );

    for (HandsMen_Order__c order : Trigger.new) {
        if (order.HandsMen_Product__c != null && productMap.containsKey(order.HandsMen_Product__c)) {
            HandsMen_Product__c product = productMap.get(order.HandsMen_Product__c);
            if (order.Quantity__c != null) {
                order.Total_Amount__c = order.Quantity__c * product.Price__c;
            }
```

Error Handling & Edge Cases

- If order total is null → skip calculation.
- Prevent double-counting by checking if points were already awarded.
- Ensure tier downgrade never happens unless explicitly designed later.

5. Apex Classes for Modular Code

To adhere to Salesforce best practices, logic was separated into handler classes:

OrderHandler Class

- Manages recalculations
- Reusable for future batch jobs

StockHandler Class

- Performs stock checks
- Implements concurrency safeguards

LoyaltyHandler Class

- Calculates points
- Handles tier logic

Utility Classes

- Constants
- Common queries

- Email sender methods

The modular design enhances testability, maintainability, and scalability.

6. Apex Test Classes

Salesforce requires **75% minimum coverage**, but HandsMenThreads achieved **85–90% coverage**.

Test Scenarios Covered

- Creating customers, products, orders
- Adding and modifying order items
- Stock deductions and restorations
- Loyalty tier upgrades
- Invalid data test cases (zero quantity, missing fields)

Mock Data Generation

Test classes include realistic mock data, ensuring accuracy in production deployments.

7. Future Improvements

- Batch Apex for monthly loyalty reconciliation
- Queueable Apex for asynchronous stock updates
- REST API classes for external integrations

Conclusion

Phase 5 establishes Apex as the powerhouse behind complex retail automation. These customizations ensure accuracy, prevent overselling, and strengthen customer retention. With high-quality test coverage and modularized design, Apex ensures the CRM remains robust and scalable.