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Task 1 : Use Case Textual Descriptions for "Process Sale" and "Handle Return"

1. Use Case Name: Process Sale

- **Primary Actor:** Cashier

- **Secondary Actors:** Inventory System, Catalog System

- **Preconditions:**
 - The cashier must be logged into the POS system.
 - The system must have access to the catalog and inventory systems.

- **Postconditions:**
 - A sale is successfully processed.
 - Inventory levels are updated.
 - Payment is processed and receipt is printed.

- **Main Success Scenario:**

- The cashier starts a new sale by scanning the first item.
 - The system retrieves the item's details (name and price) from the catalog system.
 - The inventory system updates the stock for the item.
 - The cashier scans additional items, and the system repeats steps 2 and 3 for each item.
 - The cashier selects a payment method (cash, credit card, or check).
 - The system processes the payment.
 - The system prints a receipt.
 - The transaction is completed.
- **Extensions:**
 - 5a. If the customer uses a gift coupon:
 - 1. The cashier processes the coupon.
 - 2. The system deducts the coupon value from the total price.
 - 6a. If payment fails:
 - 1. The system notifies the cashier of the failure.
 - 2. The cashier selects another payment method, and the payment is retried.

2. Use Case Name: Handle Return

- **Primary Actor:** Cashier
- **Secondary Actors:** Inventory System, Customer
- **Preconditions:**
 - The customer has purchased the item from the store previously.
 - The cashier is logged into the POS system.
- **Postconditions:**
 - The return is successfully processed.
 - The stock levels are updated to reflect the return.
 - The customer is refunded or given store credit.

- **Main Success Scenario:**
 - The customer approaches the cashier to return an item.
 - The cashier retrieves the original purchase details from the system by scanning the receipt or searching by transaction.
 - The cashier scans the item being returned.
 - The system validates the return (e.g., checks the time limit for returns).
 - The cashier confirms the refund method (cash, credit card, or store credit).
 - The inventory system updates the stock to reflect the returned item.
 - The cashier completes the return process and provides a refund.

- **Extensions:**
 - 4a. If the return is not valid:
 1. The system notifies the cashier with the reason for invalidation (e.g., the return period has expired).
 2. The cashier informs the customer and terminates the return process.
 - 5a. If the customer has lost the receipt:
 1. The cashier searches for the transaction using alternative information (e.g., customer's credit card).
 2. The system attempts to locate the transaction for validation.

Task 2 : Identify Entity/Boundary Control Objects

1. Process Sale Use Case

Entity Objects:

- **Sale:** Represents the entire sale transaction, including the list of items, total price, discounts, and the payment details.
- **Item:** Represents each individual item being sold, including its name, price, and unique identifier (e.g., barcode).
- **Catalog:** Represents the system that stores and retrieves item information like price, name, and description.
- **Inventory:** Represents the system that keeps track of the stock levels for each item and updates the stock after a sale.
- **Payment:** Represents the payment details of the transaction, including method (cash, credit card, etc.) and the amount.

- **Receipt:** Represents the printed or electronic receipt provided to the customer after the transaction.
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Boundary Objects:

- **POS Terminal Interface:** The user interface that the cashier interacts with during the sale. It includes functions for scanning items, selecting payment methods, and printing the receipt.
- **Catalog System Interface:** The interface for querying item details (name, price) from the catalog system.
- **Inventory System Interface:** The interface for updating and retrieving stock levels from the inventory system.
- **Payment System Interface:** The interface for processing payments through various methods (cash, credit card, etc.).
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Control Objects:

- **ProcessSaleController:** Manages the overall flow of the sale, including adding items to the sale, retrieving item details from the catalog, and updating inventory.
- **PaymentController:** Handles the process of validating and processing payments.
- **ReceiptController:** Manages the creation and printing of the receipt.

2. Handle Return Use Case

Entity Objects:

- **Return:** Represents the return transaction, including details of the returned items, refund amount, and the original sale transaction.
- **Item:** Represents the item being returned, including details such as name, price, and unique identifier.
- **Inventory:** Represents the system that updates stock levels to account for the returned item.
- **Sale:** Represents the original sale that the returned item is part of.
- **Refund:** Represents the refund details, including the amount and method (cash, store credit, etc.).

Boundary Objects:

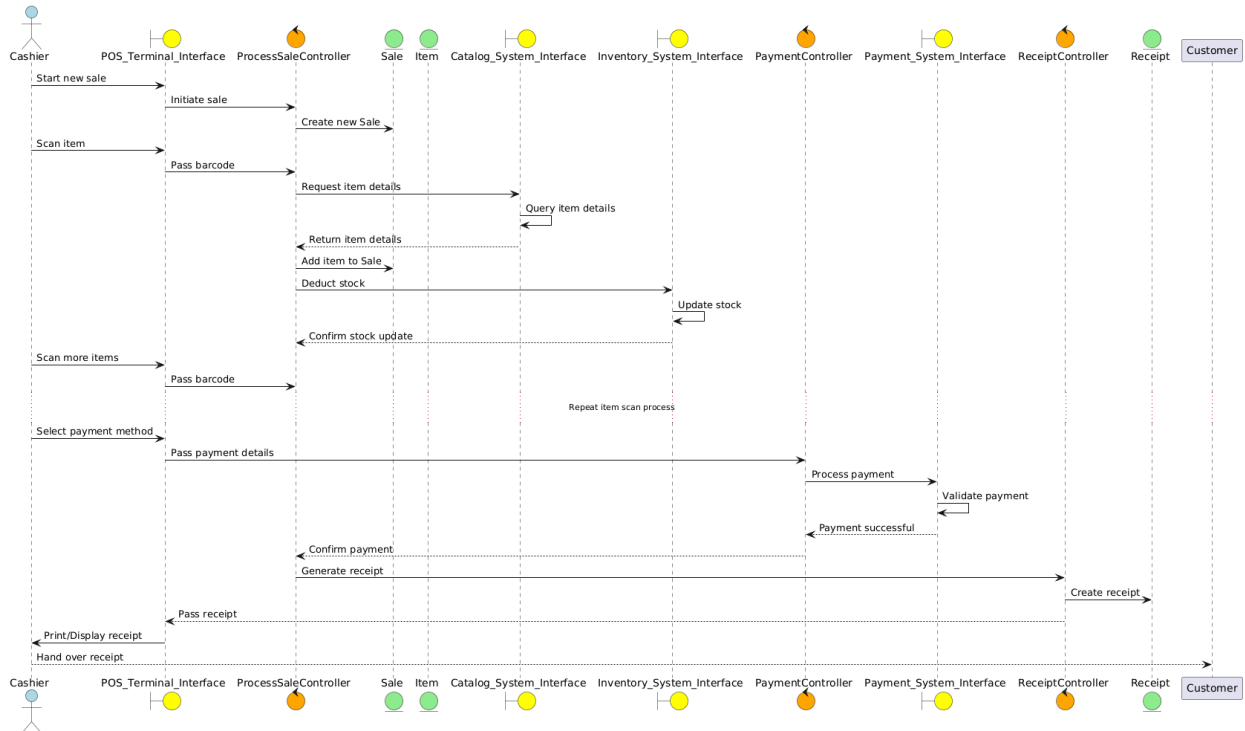
- **POS Terminal Interface:** The user interface used by the cashier to process the return, scan items, and issue refunds.
- **Inventory System Interface:** The interface used to update stock levels for the returned items.
- **Payment System Interface:** The interface used to process refunds (either cash or store credit).

Control Objects:

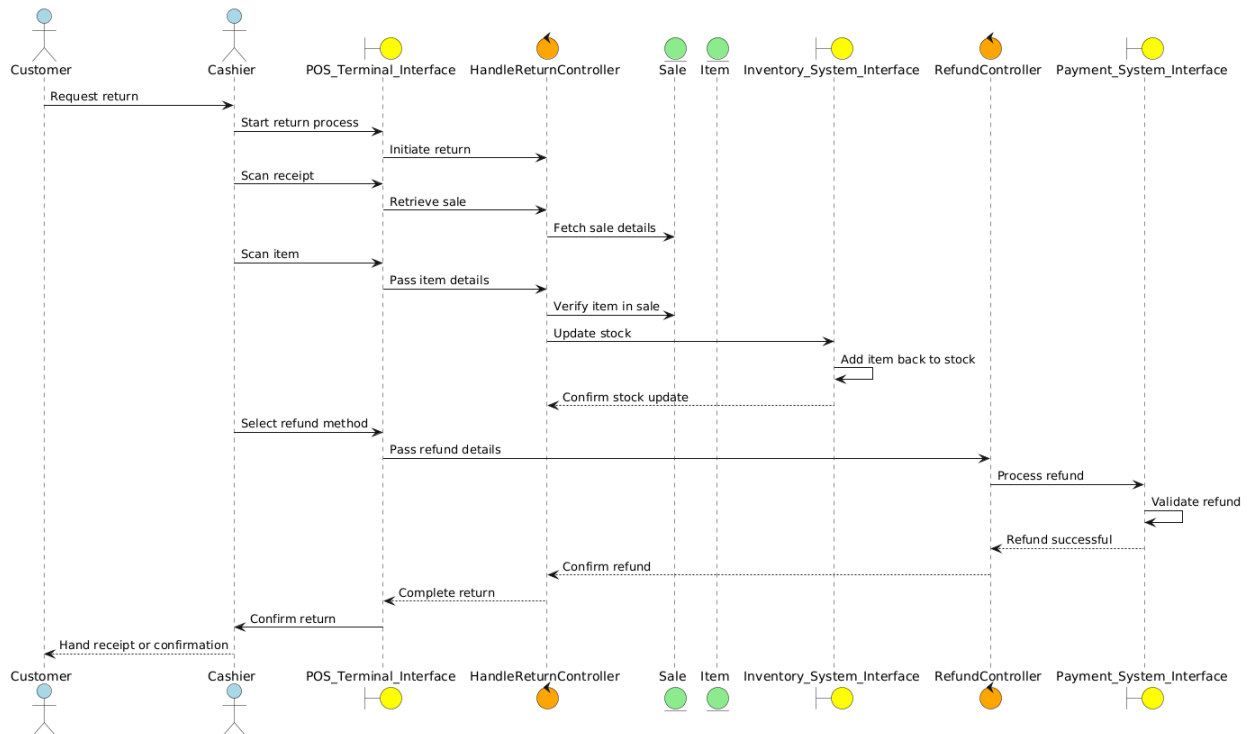
- **HandleReturnController:** Manages the overall flow of the return process, including identifying the original sale, verifying the return, and updating the inventory.
- **RefundController:** Handles the refund process and ensures that the correct refund method is applied.

Task 3 : Develop Sequence Diagrams

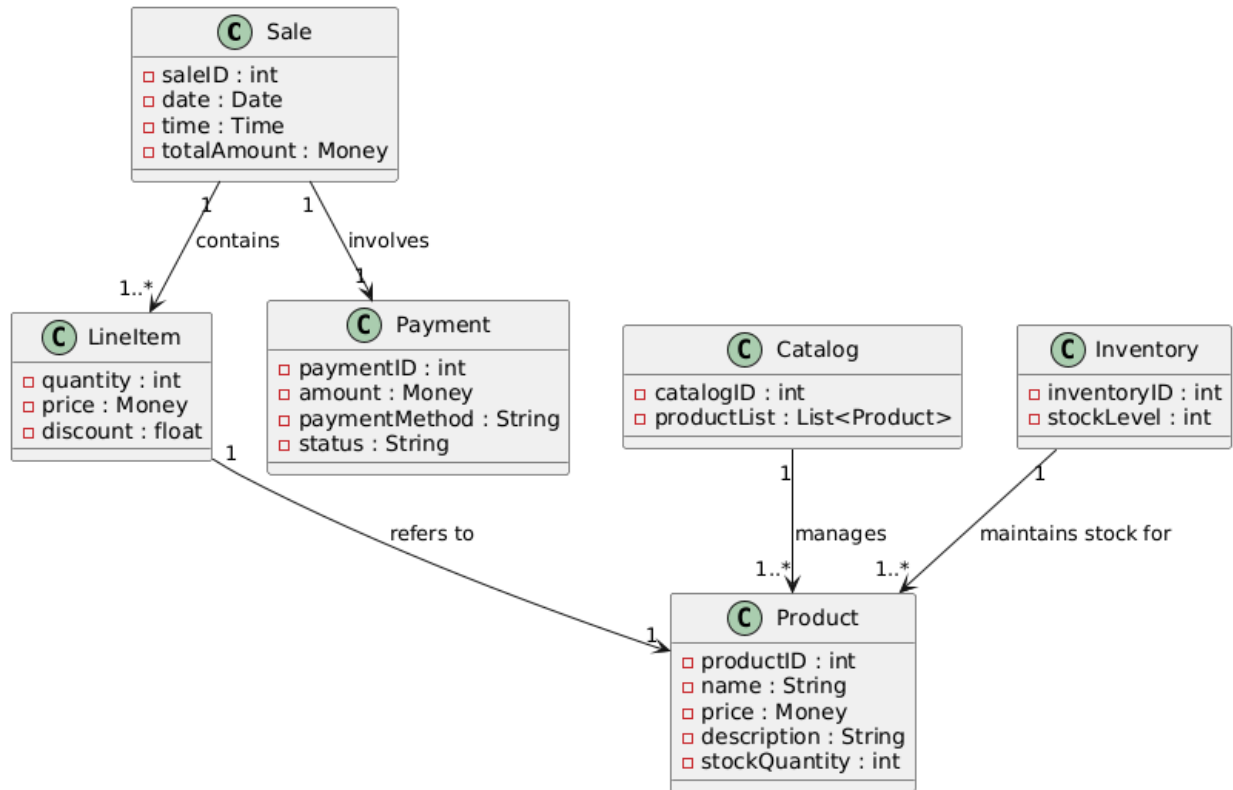
1. Process Sale Sequence diagram



2. Handle Return Sequence diagram

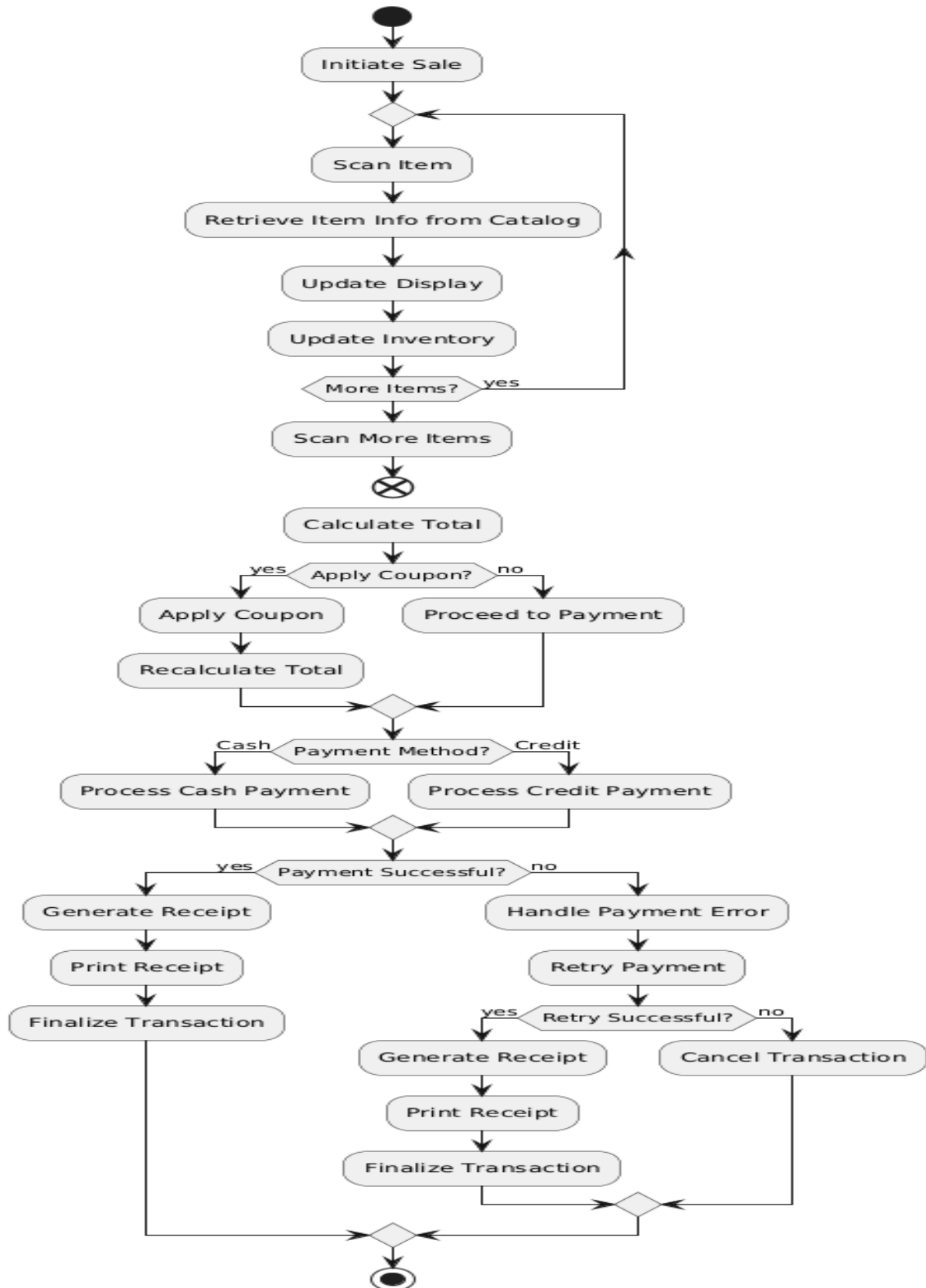


Task 4 : Develop Analysis Domain Models



Task 5 : Develop activity diagram for "Process Sale" and "Handle Return" use cases.

1. Process Sale Activity diagram



2. Handle Return Activity diagram

